



# Kodiak Cutting Tools

MADE IN THE USA

2700 Bellevue Ave, Syracuse NY 13219

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## 2012 PRODUCT CATALOG

**Made in the USA**

Premium Quality Cutting Tools for Precision Machining

ENDMILLS  
MICRO ENDMILLS  
THREADMILLS  
DRILL MILLS  
DRILLS  
CHAMFER MILLS  
REAMERS  
BURS  
COUNTERSINKS  
TAPS & DIES



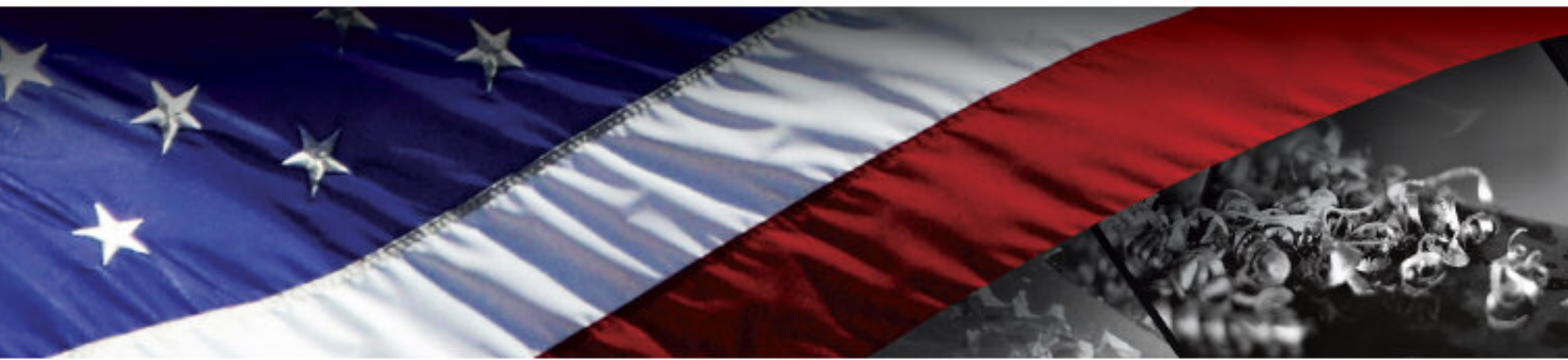
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SOLID CARBIDE // HIGH SPEED STEEL // COBALT

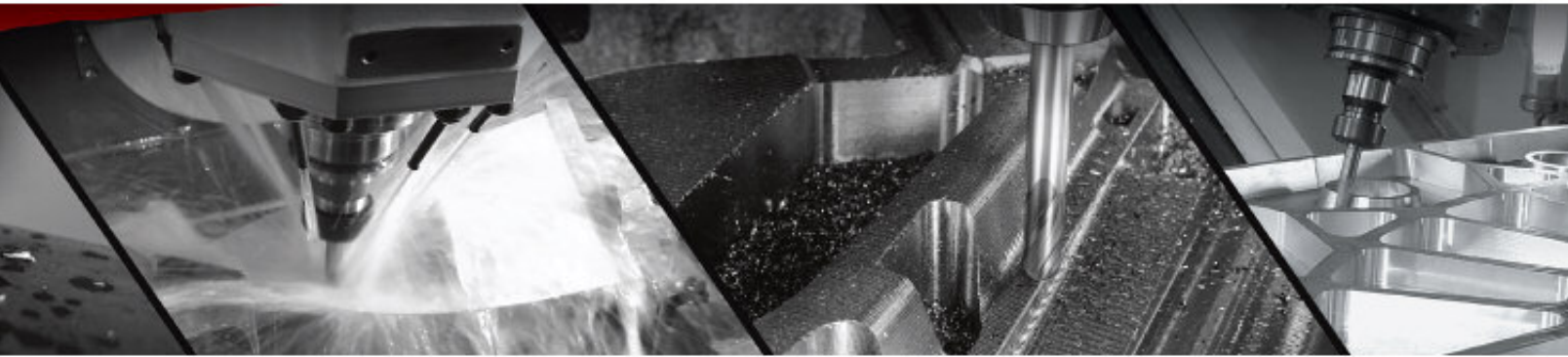
## **OUR COMMITMENT TO YOU...**

- ★ **100% USA MADE PREMIUM INDUSTRIAL QUALITY PRODUCTS**
- ★ **95% ORDER FULFILLMENT**
- ★ **SAME DAY SHIPPING**
- ★ **NO MINIMUM ORDER REQUIREMENTS**
- ★ **EXCEPTIONAL QUALITY CONTROL**





PREMIUM QUALITY // MADE IN THE USA // CUTTING TOOLS



**ALL TOOLS ARE 100% MADE IN THE USA**

# **PVD Coating Advantages and Usage**

Many of our tools are available in a variety of coatings which increase cutting tool performance in terms of wear resistance, abrasion prevention, corrosion and oxidation at high temperatures.

Based on PVD technology (Physical Vapor Deposition) and using Cathode ARC technology, we offer the highest standard of modern coating technology for High Speed Steel, M42 Cobalt and Tungsten Carbide.

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# PVD Coatings Available:

## ALTIN

ALTIN is a high performance coating for milling, tapping and drilling in stainless steels, carbon steels, alloy steels, titanium and cast iron. This coating 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.

## ALCRO-MAX

ALCRO-MAX is a Triple Platin Coating 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, increases the micro-hardness up to 3500Hv and stops the crack propagation through the coating. ALCRO-MAX is mostly suitable when machining tool steel and shows excellent behavior for wet and MQL (minimum quantity lubrication) conditions.

## TICN

TICN is a general purpose coating used for milling a wide variety of materials. This would be an option when ALTIN cannot be used, as in applications that can't generate the speeds and feeds required for higher cutting temperatures.

## ZRN

ZRN is a high performance coating for milling non-ferrous materials such as aluminum. It prevents edge build up that is typical in soft and sticky materials.

## TIN

TIN is a special multilayer coating for tapping and drilling in a wide variety of materials. It's generally used in applications with lower cutting speeds.

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## HIGH-PERFORMANCE TOOLS

Endmills ▪ Taps

## SOLID CARBIDE TOOLS

Endmills ▪ Micro Endmills ▪ Drill Mills  
Chamfer Mills ▪ Drills ▪ Threadmills ▪ Burs  
Reamers ▪ Threadmills ▪ Countersinks

## HIGH SPEED STEEL TOOLS

Drills ▪ Taps & Dies ▪ Reamers  
Endmills ▪ Countersinks

## COBALT TOOLS

Drills ▪ Endmills ▪ Reamers



















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HIGH VANADIUM POWDERED METAL

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# Solid Carbide Endmills



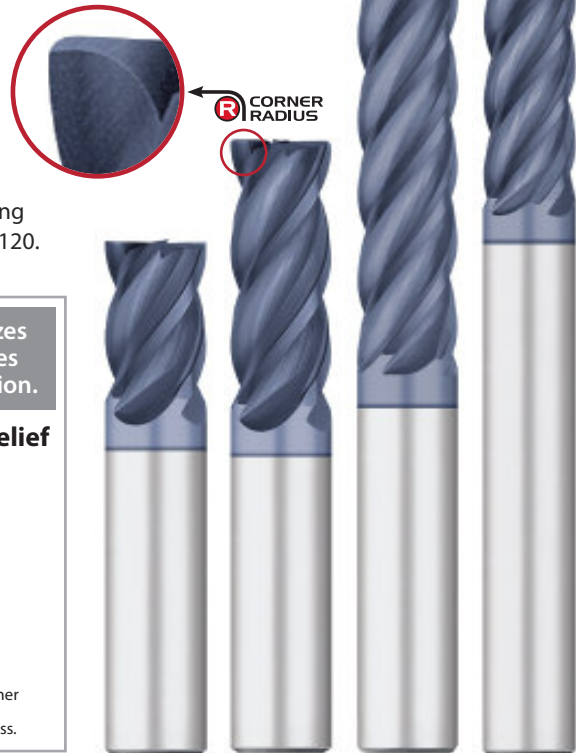
## VI-PRO

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

- 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, Cast Iron, Titanium, Stainless Steel, High Temp and all other ferrous 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 Flute - Stub, Regular, Long & Extra Long Lengths
- Available in Square End and various **R** Corner Radius sizes
- Offered in ALTiN & ALCRO-MAX to cover a wide range of materials
- Made in the USA from premium solid micrograin carbide

### Why use our **R** Corner Radius tools?

- The tools improve productivity and reduce costs.
- A sharp corner of an endmill is its weakest point. The corner radius design strengthens the endmill by reducing chipping and providing longer tool life.
- Extensive offering of Corner Radius tools: Stub, Regular, Long & Extra Long Lengths, with radius starting at 0.008 up to 0.120.



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

#### Advantages of Eccentric Relief vs Conventional Relief

<p>CONVENTIONAL RELIEF</p> <p>CONVENTIONAL RELIEF</p> <p>Edge is relatively weak and does not support radial forces, has minimal contact area for wear.</p>	<p>ECCENTRIC RELIEF</p> <p>ECCENTRIC RELIEF</p> <p>Edge has full support permitting higher feed rates and progressive wear is countered by increased flute thickness.</p>
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HIGH PERFORMANCE - CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Endmills

## VI-PRO

### VARIABLE INDEX

#### STUB LENGTH - 4 FLUTE - SQUARE END



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/8	1/8	1/4	1-1/2	4	245821	23.33	-	-	-	-	-	-
3/16	3/16	3/8	2	4	245832	30.02	-	-	-	-	-	-
1/4	1/4	3/8	2	4	245843	33.97	-	-	245942	37.37	-	-
5/16	5/16	7/16	2	4	245854	49.42	-	-	245953	54.36	-	-
3/8	3/8	1/2	2	4	245865	54.78	-	-	245964	60.26	-	-
1/2	1/2	5/8	2-1/2	4	245876	81.91	245909	86.57	245975	90.10	246008	95.23
5/8	5/8	3/4	3	4	245887	161.26	245920	165.92	245986	169.32	246019	174.22
3/4	3/4	1	3	4	245898	212.68	245931	217.34	245997	223.31	246030	228.21

### VARIABLE INDEX

#### REGULAR LENGTH - 4 FLUTE - SQUARE END



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/8	1/8	1/2	2	4	246261	27.88	-	-	-	-	-	-
3/16	3/16	9/16	2	4	246272	31.87	-	-	-	-	-	-
1/4	1/4	3/4	2-1/2	4	246283	40.45	-	-	246426	44.49	-	-
5/16	5/16	13/16	2-1/2	4	246294	53.57	-	-	246437	58.92	-	-
3/8	3/8	1	2-1/2	4	246305	62.75	-	-	246448	69.03	-	-
1/2	1/2	1	3	4	246316	94.13	246371	98.79	246459	103.54	246514	108.67
1/2	1/2	1-1/4	3	4	246327	94.13	246382	98.79	246470	103.54	246525	108.67
5/8	5/8	1-5/8	3-1/2	4	246338	170.40	246393	175.06	246481	178.92	246536	183.81
3/4	3/4	1-5/8	4	4	246349	235.43	246404	240.09	246492	247.20	246547	252.10
1	1	2	4	4	246360	439.49	246415	444.15	246503	461.46	246558	466.36

For VI-PRO technical & coating information, please see page 19.

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

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

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.000, -0.002	-0.001, -0.004
5/8" - 1"	+0.000, -0.003	-0.001, -0.004

CARBIDE ENDMILLS - CARBIDE DRILL MILLS - CARBIDE DRILLS - CARBIDE REAMERS - CARBIDE BURS - COUNTERSINKS - TAPS & DIES - HSS & COBALT DRILLS - HSS & COBALT ENDMILLS - HSS & COBALT REAMERS

# Solid Carbide Endmills



## VI-PRO

### VARIABLE INDEX

#### LONG LENGTH - 4 FLUTE - SQUARE END



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO				ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	4	247801	46.06	-	-	247944	50.67	-	-
5/16	5/16	1-1/8	3	4	247812	63.73	-	-	247955	70.10	-	-
3/8	3/8	1-1/4	3	4	247823	85.59	-	-	247966	94.15	-	-
1/2	1/2	1-1/2	4	4	247834	118.18	247889	122.84	247977	130.00	248032	135.13
1/2	1/2	2	4	4	247845	131.05	247900	135.71	247988	144.15	248043	149.28
5/8	5/8	2-1/4	5	4	247856	243.73	247911	248.39	247999	255.92	248054	260.81
3/4	3/4	2-1/4	5	4	247867	294.92	247922	299.58	248010	309.66	248065	314.56
1	1	2-1/4	5	4	247878	486.06	247933	490.72	248021	510.36	248076	515.26

### VARIABLE INDEX

#### EXTRA LONG LENGTH - 4 FLUTE - SQUARE END



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO				ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	1-1/2	4	4	248659	55.03	-	-	248813	60.53	-	-
3/8	3/8	2	4	4	248670	96.46	-	-	248824	106.10	-	-
1/2	1/2	3	6	4	248681	184.80	248747	189.46	248835	203.28	248901	208.41
5/8	5/8	3	6	4	248692	262.84	248758	267.51	248846	275.99	248912	280.88
3/4	3/4	3	6	4	248703	346.95	248769	351.61	248857	364.29	248923	369.19
3/4	3/4	4	7	4	248714	569.74	248780	574.41	248868	598.23	248934	603.13
1	1	3	6	4	248725	565.64	248791	570.30	248879	593.92	248945	598.82
1	1	4-1/4	7	4	248736	835.00	248802	840.00	248890	876.00	248956	881.00

For VI-PRO technical & coating information, please see page 19.

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

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

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+0.00, -0.02	-0.001, -0.004
5/8" - 1"	+0.00, -0.03	-0.001, -0.004



# Solid Carbide Endmills

## VI-PRO

### VARIABLE INDEX

Ⓡ CORNER RADIUS - STUB LENGTH - 4 FLUTE



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	Ⓡ RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/8	1/8	1/4	1-1/2	4	0.008	246041	26.89	-	-	-	-	-	-
3/16	3/16	3/8	2	4	0.008	246052	33.58	-	-	-	-	-	-
1/4	1/4	3/8	2	4	0.015	246063	39.59	-	-	246162	43.55	-	-
5/16	5/16	7/16	2	4	0.015	246074	53.29	-	-	246173	58.62	-	-
3/8	3/8	1/2	2	4	0.015	246085	58.65	-	-	246184	64.51	-	-
1/2	1/2	5/8	2-1/2	4	0.030	246096	89.65	246129	94.31	246195	98.62	246228	103.74
5/8	5/8	3/4	3	4	0.030	246107	169.00	246140	173.66	246206	177.45	246239	182.34
3/4	3/4	1	3	4	0.030	246118	220.42	246151	225.08	246217	231.44	246250	236.34

For VI-PRO technical & coating information, please see page 19.

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

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



PREMIUM QUALITY CUTTING TOOLS FOR PRECISION MACHINING

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.0001, -0.0004	+0.02, -0.02
5/8" - 3/4"	+0.00, -0.03	-0.0001, -0.0004	+0.02, -0.02

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



## VI-PRO

### VARIABLE INDEX

Ⓡ CORNER RADIUS - REGULAR LENGTH - 4 FLUTE



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	Ⓡ RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/8	1/8	1/2	2	4	0.010	246569	31.44	-	-	-	-	-	-
1/8	1/8	1/2	2	4	0.020	246580	31.44	-	-	-	-	-	-
1/8	1/8	1/2	2	4	0.030	246591	31.44	-	-	-	-	-	-
3/16	3/16	9/16	2	4	0.010	246602	35.43	-	-	-	-	-	-
3/16	3/16	9/16	2	4	0.020	246613	35.43	-	-	-	-	-	-
3/16	3/16	9/16	2	4	0.030	246624	35.43	-	-	-	-	-	-
1/4	1/4	3/4	2-1/2	4	0.015	246635	44.01	-	-	247218	48.41	-	-
1/4	1/4	3/4	2-1/2	4	0.030	246646	44.01	-	-	247229	48.41	-	-
1/4	1/4	3/4	2-1/2	4	0.060	246657	44.01	-	-	247240	48.41	-	-
5/16	5/16	13/16	2-1/2	4	0.015	246668	56.69	-	-	247251	62.36	-	-
5/16	5/16	13/16	2-1/2	4	0.030	246679	56.69	-	-	247262	62.36	-	-
5/16	5/16	13/16	2-1/2	4	0.060	246690	56.69	-	-	247273	62.36	-	-
3/8	3/8	1	2-1/2	4	0.015	246701	66.20	-	-	247284	72.82	-	-
3/8	3/8	1	2-1/2	4	0.030	246712	66.20	-	-	247295	72.82	-	-
3/8	3/8	1	2-1/2	4	0.060	246723	66.20	-	-	247306	72.82	-	-
1/2	1/2	1	3	4	0.015	246734	105.76	246976	111.05	247317	116.34	247559	122.16
1/2	1/2	1	3	4	0.030	246745	105.76	246987	111.05	247328	116.34	247570	122.16
1/2	1/2	1	3	4	0.060	246756	105.76	246998	111.05	247339	116.34	247581	122.16
1/2	1/2	1	3	4	0.090	246767	105.76	247009	111.05	247350	116.34	247592	122.16
1/2	1/2	1	3	4	0.120	246778	105.76	247020	111.05	247361	116.34	247603	122.16
1/2	1/2	1-1/4	3	4	0.015	246789	105.76	247031	111.05	247372	116.34	247614	122.16
1/2	1/2	1-1/4	3	4	0.030	246800	105.76	247042	111.05	247383	116.34	247625	122.16
1/2	1/2	1-1/4	3	4	0.060	246811	105.76	247053	111.05	247394	116.34	247636	122.16
1/2	1/2	1-1/4	3	4	0.090	246822	105.76	247064	111.05	247405	116.34	247647	122.16
1/2	1/2	1-1/4	3	4	0.120	246833	105.76	247075	111.05	247416	116.34	247658	122.16
5/8	5/8	1-5/8	3-1/2	4	0.030	246844	178.18	247086	182.84	247427	187.09	247669	191.99
5/8	5/8	1-5/8	3-1/2	4	0.060	246855	178.18	247097	182.84	247438	187.09	247680	191.99
5/8	5/8	1-5/8	3-1/2	4	0.090	246866	178.18	247108	182.84	247449	187.09	247691	191.99
5/8	5/8	1-5/8	3-1/2	4	0.120	246877	178.18	247119	182.84	247460	187.09	247702	191.99
3/4	3/4	1-5/8	4	4	0.030	246888	247.09	247130	251.75	247471	259.44	247713	264.34
3/4	3/4	1-5/8	4	4	0.060	246899	247.09	247141	251.75	247482	259.44	247724	264.34
3/4	3/4	1-5/8	4	4	0.090	246910	247.09	247152	251.75	247493	259.44	247735	264.34
3/4	3/4	1-5/8	4	4	0.120	246921	247.09	247163	251.75	247504	259.44	247746	264.34
1	1	2	4	4	0.030	246932	451.14	247174	455.80	247515	473.70	247757	478.59
1	1	2	4	4	0.060	246943	451.14	247185	455.80	247526	473.70	247768	478.59
1	1	2	4	4	0.090	246954	451.14	247196	455.80	247537	473.70	247779	478.59
1	1	2	4	4	0.120	246965	451.14	247207	455.80	247548	473.70	247790	478.59

For VI-PRO technical & coating information, please see page 19.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.02, -0.02
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.02, -0.02



# Solid Carbide Endmills

## VI-PRO

### VARIABLE INDEX

**R CORNER RADIUS - LONG LENGTH - 4 FLUTE**



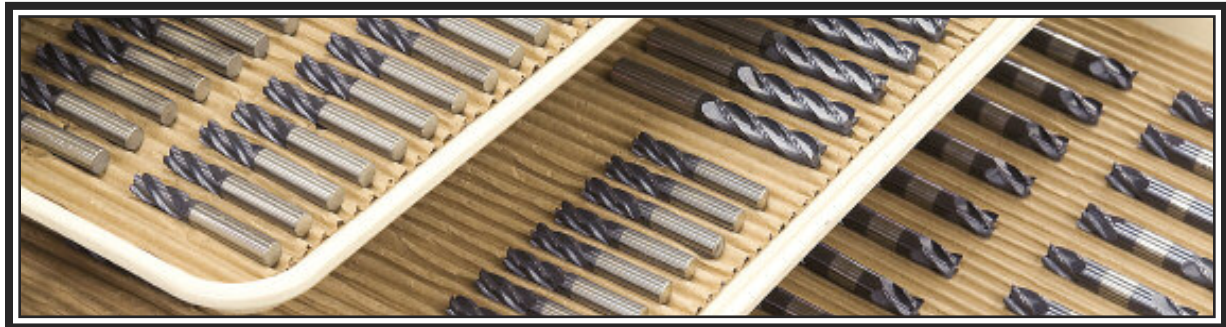
AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS		ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	4	0.015		248087	49.62	-	-	248373	54.59	-	-
1/4	1/4	1-1/8	3	4	0.030		248098	49.62	-	-	248384	54.59	-	-
5/16	5/16	1-1/8	3	4	0.015		248109	67.60	-	-	248395	74.36	-	-
5/16	5/16	1-1/8	3	4	0.030		248120	67.60	-	-	248406	74.36	-	-
3/8	3/8	1-1/4	3	4	0.030		248131	89.46	-	-	248417	98.41	-	-
3/8	3/8	1-1/4	3	4	0.060		248142	89.46	-	-	248428	98.41	-	-
1/2	1/2	1-1/2	4	4	0.030		248153	125.92	248263	130.58	248439	138.51	248549	143.64
1/2	1/2	1-1/2	4	4	0.060		248164	125.92	248274	130.58	248450	138.51	248560	143.64
1/2	1/2	2	4	4	0.030		248175	138.79	248285	143.45	248461	152.67	248571	157.79
1/2	1/2	2	4	4	0.060		248186	138.79	248296	143.45	248472	152.67	248582	157.79
5/8	5/8	2-1/4	5	4	0.030		248197	251.47	248307	256.13	248483	264.04	248593	268.94
5/8	5/8	2-1/4	5	4	0.060		248208	251.47	248318	256.13	248494	264.04	248604	268.94
3/4	3/4	2-1/4	5	4	0.030		248219	316.67	248329	322.73	248505	332.50	248615	338.86
3/4	3/4	2-1/4	5	4	0.060		248230	316.67	248340	322.73	248516	332.50	248626	338.86
1	1	2-1/4	5	4	0.030		248241	493.80	248351	498.46	248527	518.49	248637	523.38
1	1	2-1/4	5	4	0.060		248252	493.80	248362	498.46	248538	518.49	248648	523.38

For VI-PRO technical & coating information, please see page 19.

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

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



**PVD COATINGS INCREASE CUTTING TOOL PERFORMANCE**

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004	+0.02, -.002
5/8" - 1"	+0.00, -.003	-.0001, -.0004	+0.02, -.002

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HIGH PERFORMANCE - CARBIDE ENDMILLS**

# Solid Carbide Endmills



## VI-PRO

### VARIABLE INDEX

**® CORNER RADIUS - EXTRA LONG LENGTH - 4 FLUTE**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	
1/4	1/4	1-1/2	4	4	0.015	248967	60.39	-	-	249275	66.43	-	-	
1/4	1/4	1-1/2	4	4	0.030	248978	60.39	-	-	249286	66.43	-	-	
3/8	3/8	2	4	4	0.030	248989	102.28	-	-	249297	112.51	-	-	
3/8	3/8	2	4	4	0.060	249000	102.28	-	-	249308	112.51	-	-	
1/2	1/2	3	6	4	0.030	249011	190.63	249143	195.29	249319	209.69	249451	214.82	
1/2	1/2	3	6	4	0.060	249022	190.63	249154	195.29	249330	209.69	249462	214.82	
5/8	5/8	3	6	4	0.030	249033	268.62	249165	273.29	249341	282.06	249473	286.95	
5/8	5/8	3	6	4	0.060	249044	268.62	249176	273.29	249352	282.06	249484	286.95	
3/4	3/4	3	6	4	0.030	249055	354.69	249187	359.35	249363	372.42	249495	377.31	
3/4	3/4	3	6	4	0.060	249066	354.69	249198	359.35	249374	372.42	249506	377.31	
3/4	3/4	4	7	4	0.030	249077	577.48	249209	582.14	249385	606.36	249517	611.25	
3/4	3/4	4	7	4	0.060	249088	577.48	249220	582.14	249396	606.36	249528	611.25	
1	1	3	6	4	0.030	249099	580.56	249231	585.22	249407	609.59	249539	614.48	
1	1	3	6	4	0.060	249110	580.56	249242	585.22	249418	609.59	249550	614.48	
1	1	4-1/4	7	4	0.030	249121	843.00	249253	848.00	249429	884.00	249561	889.00	
1	1	4-1/4	7	4	0.060	249132	843.00	249264	848.00	249440	884.00	249572	889.00	

For VI-PRO technical & coating information, please see page 19.

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

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



**PREMIUM QUALITY CUTTING TOOLS FOR PRECISION MACHINING**

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.02	-0.0001, -0.0004	+0.02, -0.02
5/8" - 1"	+0.00, -0.03	-0.0001, -0.0004	+0.02, -0.02



# Solid Carbide Endmills

## VI-PRO

### VARIABLE INDEX

**R** CORNER RADIUS - REGULAR LENGTH - 5 FLUTE



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	
1/4	1/4	3/4	2-1/2	5	0.015	249583	48.41	-	-	250166	53.25	-	-	
1/4	1/4	3/4	2-1/2	5	0.030	249594	48.41	-	-	250177	53.25	-	-	
1/4	1/4	3/4	2-1/2	5	0.060	249605	48.41	-	-	250188	53.25	-	-	
5/16	5/16	13/16	2-1/2	5	0.015	249616	62.36	-	-	250199	68.59	-	-	
5/16	5/16	13/16	2-1/2	5	0.030	249627	62.36	-	-	250210	68.59	-	-	
5/16	5/16	13/16	2-1/2	5	0.060	249638	62.36	-	-	250221	68.59	-	-	
3/8	3/8	1	2-1/2	5	0.015	249649	72.82	-	-	250232	80.10	-	-	
3/8	3/8	1	2-1/2	5	0.030	249660	72.82	-	-	250243	80.10	-	-	
3/8	3/8	1	2-1/2	5	0.060	249671	72.82	-	-	250254	80.10	-	-	
1/2	1/2	1	3	5	0.015	249682	116.34	249924	122.16	250265	127.97	250507	134.37	
1/2	1/2	1	3	5	0.030	249693	116.34	249935	122.16	250276	127.97	250518	134.37	
1/2	1/2	1	3	5	0.060	249704	116.34	249946	122.16	250287	127.97	250529	134.37	
1/2	1/2	1	3	5	0.090	249715	116.34	249957	122.16	250298	127.97	250540	134.37	
1/2	1/2	1	3	5	0.120	249726	116.34	249968	122.16	250309	127.97	250551	134.37	
1/2	1/2	1-1/4	3	5	0.015	249737	116.34	249979	122.16	250320	127.97	250562	134.37	
1/2	1/2	1-1/4	3	5	0.030	249748	116.34	249990	122.16	250331	127.97	250573	134.37	
1/2	1/2	1-1/4	3	5	0.060	249759	116.34	250001	122.16	250342	127.97	250584	134.37	
1/2	1/2	1-1/4	3	5	0.090	249770	116.34	250012	122.16	250353	127.97	250595	134.37	
1/2	1/2	1-1/4	3	5	0.120	249781	116.34	250023	122.16	250364	127.97	250606	134.37	
5/8	5/8	1-5/8	3-1/2	5	0.030	249792	196.00	250034	201.13	250375	205.80	250617	211.18	
5/8	5/8	1-5/8	3-1/2	5	0.060	249803	196.00	250045	201.13	250386	205.80	250628	211.18	
5/8	5/8	1-5/8	3-1/2	5	0.090	249814	196.00	250056	201.13	250397	205.80	250639	211.18	
5/8	5/8	1-5/8	3-1/2	5	0.120	249825	196.00	250067	201.13	250408	205.80	250650	211.18	
3/4	3/4	1-5/8	4	5	0.030	249836	271.79	250078	276.92	250419	285.38	250661	290.77	
3/4	3/4	1-5/8	4	5	0.060	249847	271.79	250089	276.92	250430	285.38	250672	290.77	
3/4	3/4	1-5/8	4	5	0.090	249858	271.79	250100	276.92	250441	285.38	250683	290.77	
3/4	3/4	1-5/8	4	5	0.120	249869	271.79	250111	276.92	250452	285.38	250694	290.77	
1	1	2	4	5	0.030	249880	496.26	250122	501.38	250463	521.07	250705	526.45	
1	1	2	4	5	0.060	249891	496.26	250133	501.38	250474	521.07	250716	526.45	
1	1	2	4	5	0.090	249902	496.26	250144	501.38	250485	521.07	250727	526.45	
1	1	2	4	5	0.120	249913	496.26	250155	501.38	250496	521.07	250738	526.45	

For VI-PRO technical & coating information, please see page 19.

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

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

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004	+0.02, -.002
5/8" - 1"	+0.00, -.003	-.0001, -.0004	+0.02, -.002

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



## VI-PRO

### VARIABLE INDEX

**® CORNER RADIUS - LONG LENGTH - 5 FLUTE**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS		ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	5	0.015		250749	54.59	-	-	250991	60.05	-	-
1/4	1/4	1-1/8	3	5	0.030		250760	54.59	-	-	251002	60.05	-	-
5/16	5/16	1-1/8	3	5	0.015		250771	74.36	-	-	251013	81.79	-	-
5/16	5/16	1-1/8	3	5	0.030		250782	74.36	-	-	251024	81.79	-	-
3/8	3/8	1-1/4	3	5	0.030		250793	98.41	-	-	251035	108.25	-	-
3/8	3/8	1-1/4	3	5	0.060		250804	98.41	-	-	251046	108.25	-	-
1/2	1/2	2	4	5	0.030		250815	152.67	250903	157.79	251057	167.93	251145	173.57
1/2	1/2	2	4	5	0.060		250826	152.67	250914	157.79	251068	167.93	251156	173.57
5/8	5/8	2-1/4	5	5	0.030		250837	276.62	250925	281.74	251079	290.45	251167	295.83
5/8	5/8	2-1/4	5	5	0.060		250848	276.62	250936	281.74	251090	290.45	251178	295.83
3/4	3/4	2-1/4	5	5	0.030		250859	348.33	250947	355.00	251101	365.75	251189	372.75
3/4	3/4	2-1/4	5	5	0.060		250870	348.33	250958	355.00	251112	365.75	251200	372.75
1	1	2-1/4	5	5	0.030		250881	543.18	250969	548.31	251123	570.34	251211	575.72
1	1	2-1/4	5	5	0.060		250892	543.18	250980	548.31	251134	570.34	251222	575.72

For VI-PRO technical & coating information, please see page 19.

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

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



**PREMIUM QUALITY CUTTING TOOLS FOR PRECISION MACHINING**

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -.002	-.0001, -.0004	+0.02, -.002
5/8" - 1"	+0.00, -.003	-.0001, -.0004	+0.02, -.002



# Solid Carbide Endmills

## VI-PRO

### VARIABLE INDEX

**R CORNER RADIUS - EXTRA LONG LENGTH - 5 FLUTE**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	
1/4	1/4	1-1/2	4	5	0.015	251233	66.43	-	-	251541	73.07	-	-	
1/4	1/4	1-1/2	4	5	0.030	251244	66.43	-	-	251552	73.07	-	-	
3/8	3/8	2	4	5	0.030	251255	112.51	-	-	251563	123.76	-	-	
3/8	3/8	2	4	5	0.060	251266	112.51	-	-	251574	123.76	-	-	
1/2	1/2	3	6	5	0.030	251277	209.69	251409	214.82	251585	230.66	251717	236.30	
1/2	1/2	3	6	5	0.060	251288	209.69	251420	214.82	251596	230.66	251728	236.30	
5/8	5/8	3	6	5	0.030	251299	295.49	251431	300.62	251607	310.26	251739	315.65	
5/8	5/8	3	6	5	0.060	251310	295.49	251442	300.62	251618	310.26	251750	315.65	
3/4	3/4	3	6	5	0.030	251321	390.15	251453	395.28	251629	409.66	251761	415.05	
3/4	3/4	3	6	5	0.060	251332	390.15	251464	395.28	251640	409.66	251772	415.05	
3/4	3/4	4	7	5	0.030	251343	635.23	251475	640.36	251651	666.99	251783	672.38	
3/4	3/4	4	7	5	0.060	251354	635.23	251486	640.36	251662	666.99	251794	672.38	
1	1	3	6	5	0.030	251365	638.62	251497	643.74	251673	670.55	251805	675.93	
1	1	3	6	5	0.060	251376	638.62	251508	643.74	251684	670.55	251816	675.93	
1	1	4-1/4	7	5	0.030	251387	927.30	251519	932.80	251695	972.00	251827	978.00	
1	1	4-1/4	7	5	0.060	251398	927.30	251530	932.80	251706	972.00	251838	978.00	

For VI-PRO technical & coating information, please see page 19.

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

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



**ALL TOOLS ARE 100% MADE IN THE USA**

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.02, -0.02
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.02, -0.02

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HIGH PERFORMANCE - CARBIDE ENDMILLS**

# Solid Carbide Endmills



## TECHNICAL INFORMATION FOR THE

# VI-PRO

- Running @ higher SFM; heavier chip loads than conventional endmills
- Speed and feed chart parameters are for full diameter slotting (VI PRO 4 flute only)
- Recommended slotting depth 1/2 diameter
- Tool holding important for maximizing tool life. Minimize TIR
- Max ramp angle recommended 3° or less

### Chip Thinning recommended to optimize tool life:

- 5% of Dia. Radial engaged: Multiply Feed 3X
- 10% of Dia. Radial engaged: Multiply Feed 2X
- 20% of Dia. Radial engaged: Multiply Feed 1.5X

### Speed and Feed Calculation:

$RPM = (3.82 \times SFM) \div Dia.$     
  $SFM = (RPM \times Dia.) \div 3.82$     
  $IPR = IPM \div RPM$   
 $IPM = IPT(chip\ load) \times No.\ of\ Teeth \times RPM$     
  $IPT(chip\ load) = IPM \div (No.\ of\ teeth \times RPM)$

## ALTiN coating & ALCRO-MAX coating for the VI-PRO

**ALTiN** - Is a high performance coating for milling, tapping and drilling in stainless steels, carbon steels, alloy steels, titanium and cast iron. This coating 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.

**ALCRO-MAX** - Has remarkable wear resistance at lower feeds and speeds and under high mechanical loads, and can be used for roughing and finishing operations. Because of its titanium addition, surface finish of the work piece (Ra, Rz) remains consistent and low during the life of the tool. ALCRO-MAX particularly excels when machining under wet or MQL (minimum quantity lubrication) conditions, cold and hot working steel, hardened and tempered up to 54 HRC.

## VI-PRO - SPEEDS & FEEDS

MATERIAL	Rc HARDNESS	4 FLUTE STUB LENGTH	4 FLUTE REG LENGTH	4 FLUTE LONG LENGTH	4 FLUTE EXTRA LONG	5 FLUTE STUB LENGTH	5 FLUTE REG LENGTH	5 FLUTE LONG LENGTH	5 FLUTE EXTRA LONG
<b>COBALT BASE ALLOYS:</b>	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125	200 - 275	200 - 275	385 - 400	385 - 400
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70	550 - 570	550 - 570	140 - 160	140 - 160
<b>NICKEL BASE ALLOYS:</b>	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125	200 - 225	200 - 225	385 - 400	385 - 400
INCOSEL-625/718, WASPALLOY, RENE, HASTELLOY	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70	200 - 225	200 - 225	140 - 160	140 - 160
<b>IRON BASE ALLOYS:</b>	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125	550 - 570	550 - 570	385 - 400	385 - 400
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70	200 - 225	200 - 225	140 - 160	140 - 160
<b>MONEL: MONEL-65% NICKEL</b>	-	150 - 200	150 - 200	105 - 140	105 - 140	550 - 570	550 - 570	385 - 400	385 - 400
<b>TITANIUM ALLOYS:</b>	-	-	-	-	-	-	-	-	-
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	200 - 325	200 - 325	140 - 230	140 - 230	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (PRECIPITATION):</b>	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210	600 - 625	600 - 625	420 - 440	420 - 440
12/8, 15/5, 17/4, AM-350/355	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (AUSTENITIC): 200 SERIES, 302, 303, 304, 316</b>	-	290 - 375	290 - 375	200 - 260	200 - 260	600 - 625	600 - 625	420 - 440	420 - 440
<b>STAINLESS STEEL (AUSTENITIC):</b>	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210	600 - 625	600 - 625	420 - 440	420 - 440
304L, 316L	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (MARTENSITIC): 403, 410, 416, 440</b>	-	250 - 300	250 - 300	175 - 210	175 - 210	600 - 625	600 - 625	420 - 440	420 - 440
<b>HIGH STRENGTH TOOL STEELS:</b>	UNDER 32	250 - 350	250 - 350	175 - 210	175 - 210	600 - 625	600 - 625	420 - 440	420 - 440
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	OVER 32	150 - 200	150 - 200	100 - 140	100 - 140	550 - 570	550 - 570	385 - 400	385 - 400
<b>CARBON STEELS: 1000's, 1100's, 1300's</b>	-	560 - 595	560 - 595	300 - 500	300 - 500	800 - 850	800 - 850	560 - 595	560 - 595
<b>DUCTILE: DUCTILE CAST IRONS</b>	-	560 - 595	560 - 595	400 - 500	400 - 500	800 - 850	800 - 850	560 - 595	560 - 595
<b>CAST IRONS: GRAY CAST IRONS</b>	-	560 - 595	560 - 595	400 - 500	400 - 500	800 - 850	800 - 850	560 - 595	560 - 595

## VI-PRO - CHIP LOAD

MATERIAL	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
<b>COBALT BASE ALLOYS</b>	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>NICKEL BASE ALLOYS</b>	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>IRON BASE ALLOYS</b>	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>MONEL</b>	.0006 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>TITANIUM ALLOYS</b>	.0006 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>STAINLESS STEEL (PRECIPITATION)</b>	.0006 - .0009	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>	.0006 - .0009	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>	.0006 - .0009	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (MARTENSITIC)</b>	.0006 - .0009	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>HIGH STRENGTH TOOL STEELS</b>	.0006 - .0009	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>CARBON STEELS</b>	.0009 - .0011	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>DUCTILE</b>	.0009 - .0011	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>CAST IRONS</b>	.0009 - .0011	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

HIGH PERFORMANCE - CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Solid Carbide Endmills

## Terminator

**REGULAR LENGTH - 6 FLUTE - SQUARE END - 40° HELIX**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

Terminator					ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	3/4	2-1/2	6	148641	79.08	-	-	252267	86.98	-	-
5/16	5/16	13/16	2-1/2	6	148652	93.92	-	-	252278	103.32	-	-
3/8	3/8	1	2-1/2	6	148663	101.21	-	-	252289	111.34	-	-
1/2	1/2	1-1/4	3	6	148685	135.33	251849	142.09	252300	148.85	252344	156.30
5/8	5/8	1-5/8	3-1/2	6	148696	225.52	251860	232.28	252311	236.79	252355	243.89
3/4	3/4	1-5/8	4	6	148707	283.08	251871	291.56	252322	297.22	252366	306.14
1	1	2	4	6	148718	433.57	251882	442.24	252333	455.24	252377	464.35

**LONG LENGTH - 6 FLUTE - SQUARE END - 40° HELIX**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

Terminator					ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	1-1/8	3	6	148817	87.18	-	-	252146	95.91	-	-
5/16	5/16	1-1/8	3	6	148828	101.73	-	-	252157	111.89	-	-
3/8	3/8	1-1/4	3	6	148839	115.60	-	-	252168	127.18	-	-
1/2	1/2	2	4	6	148861	179.81	251937	188.80	252179	197.79	252223	207.68
5/8	5/8	2-1/4	5	6	148872	279.33	251948	287.72	252190	293.30	252234	302.10
3/4	3/4	2-1/4	5	6	148883	348.84	251959	359.30	252201	366.28	252245	377.27
1	1	3	6	6	148894	707.02	251970	721.15	252212	742.36	252256	757.21

For more information on PVD coatings, please see page 3.

The Terminator features Eccentric Relief and stronger core diameter for added strength. Excellent for:

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

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.000, -0.002	-0.0001, -0.0004

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



## Terminator

**® CORNER RADIUS - REGULAR LENGTH - 6 FLUTE - 40° HELIX**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

Terminator						ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	3/4	2-1/2	6	.020	148729	88.27	-	-	252388	97.11	-	-
5/16	5/16	13/16	2-1/2	6	.020	148740	104.88	-	-	252399	115.35	-	-
3/8	3/8	1	2-1/2	6	.040	148751	113.03	-	-	252410	124.32	-	-
1/2	1/2	1-1/4	3	6	.040	148773	151.10	251893	158.64	252421	166.20	252465	174.51
5/8	5/8	1-5/8	3-1/2	6	.040	148784	240.84	251904	248.06	252432	252.88	252476	260.46
3/4	3/4	1-5/8	4	6	.040	148795	302.32	251915	311.39	252443	317.43	252487	326.96
1	1	2	4	6	.040	148806	463.03	251926	476.92	252454	486.18	252498	500.76

**® CORNER RADIUS - LONG LENGTH - 6 FLUTE - 40° HELIX**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

Terminator						ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	R RADIUS	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE	ROUND SHANK ITEM #	LIST PRICE	WELDON FLAT ITEM #	LIST PRICE
1/4	1/4	3/4	3	6	.020	148905	97.36	-	-	252025	107.08	-	-
5/16	5/16	13/16	3	6	.020	148916	113.58	-	-	252036	124.93	-	-
3/8	3/8	1	3	6	.040	148927	129.10	-	-	252047	142.00	-	-
1/2	1/2	1-1/4	4	6	.040	148949	200.76	251981	210.78	252058	220.82	252102	231.86
5/8	5/8	1-5/8	5	6	.040	148960	298.31	251992	307.27	252069	313.24	252113	322.64
3/4	3/4	1-5/8	5	6	.040	148971	372.54	252003	383.73	252080	391.18	252124	402.92
1	1	2	6	6	.040	148982	755.04	252014	770.16	252091	792.81	252135	808.67

For more information on PVD coatings, please see page 3.

TERMINATOR - SPEEDS & FEEDS										
MATERIAL	CARBON STEELS		STAINLESS STEELS		ALLOY STEELS		NICKEL/HIGH TEMP		TITANIUM AND TITANIUM ALLOYS	
SIZE	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT
1/4	275-750	0.003	90-450	0.002	200-600	0.0008-0.0010	45-115	0.0015-0.0020	250-400	0.0010-0.0020
3/8	275-750	0.003	90-450	0.002	200-600	0.0008-0.0010	45-115	0.0015-0.0020	250-400	0.0010-0.0020
1/2	275-750	0.004	90-450	0.0025-0.003	200-600	0.0010-0.0020	45-115	0.0020-0.0025	250-400	0.0010-0.0025
5/8	275-750	0.005	90-450	0.0030-0.004	200-600	0.0015-0.0030	45-115	0.0020-0.0035	250-400	0.0020-0.0030
3/4	275-750	0.006	90-450	0.0040-0.005	200-600	0.0020-0.0040	45-115	0.0020-0.0040	250-400	0.0025-0.0040
1	275-750	0.007	90-450	0.0050-0.006	200-600	0.0030-0.0050	45-115	0.0030-0.0050	250-400	0.0040-0.0060

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



# Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143064	20.53
3/16	3/16	5/8	2	3	143075	24.57
1/4	1/4	3/4	2-1/2	3	143086	26.34
5/16	5/16	13/16	2-1/2	3	143097	31.86
3/8	3/8	7/8	2-1/2	3	143108	42.66
1/2	1/2	1-1/4	3	3	143119	72.75
5/8	5/8	1-5/8	3-1/2	3	143130	144.83
3/4	3/4	1-5/8	4	3	143141	203.26

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143240	25.63
3/16	3/16	5/8	2	3	143251	30.71
1/4	1/4	3/4	2-1/2	3	143262	32.92
5/16	5/16	13/16	2-1/2	3	143273	39.83
3/8	3/8	7/8	2-1/2	3	143284	53.32
1/2	1/2	1-1/4	3	3	143295	90.97
5/8	5/8	1-5/8	3-1/2	3	143306	181.04
3/4	3/4	1-5/8	4	3	143317	254.05

## Ⓡ CORNER RADIUS - REGULAR LENGTH - 3 FLUTE - 60° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143152	22.90
3/16	3/16	5/8	2	3	.010	143163	27.43
1/4	1/4	3/4	2-1/2	3	.020	143174	29.42
5/16	5/16	13/16	2-1/2	3	.020	143185	35.56
3/8	3/8	7/8	2-1/2	3	.020	143196	47.64
1/2	1/2	1-1/4	3	3	.040	143207	81.23
5/8	5/8	1-5/8	3-1/2	3	.040	143218	154.66
3/4	3/4	1-5/8	4	3	.040	143229	217.04

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143328	28.62
3/16	3/16	5/8	2	3	.010	143339	34.27
1/4	1/4	3/4	2-1/2	3	.020	143350	36.75
5/16	5/16	13/16	2-1/2	3	.020	143361	44.46
3/8	3/8	7/8	2-1/2	3	.020	143372	59.55
1/2	1/2	1-1/4	3	3	.040	143383	101.54
5/8	5/8	1-5/8	3-1/2	3	.040	143394	193.34
3/4	3/4	1-5/8	4	3	.040	143405	271.33

These 60 degree tools are designed to machine all high temperature alloys such as inconels, hastalloy, waspalloys and titanium. This 3 flute high shear design geometry will slot and profile while giving excellent surface finishes.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.002	-0.0001, -0.0004	+0.002, -0.002
5/8" - 3/4"	+0.00, -0.003	-0.0001, -0.0004	+0.002, -0.002

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143416	20.53
3/16	3/16	5/8	2	3	143427	24.57
1/4	1/4	3/4	2-1/2	3	143438	26.34
5/16	5/16	13/16	2-1/2	3	143449	31.86
3/8	3/8	7/8	2-1/2	3	143460	42.66
1/2	1/2	1-1/4	3	3	143471	72.75
5/8	5/8	1-5/8	3-1/2	3	143482	144.83
3/4	3/4	1-5/8	4	3	143493	203.26

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143592	25.63
3/16	3/16	5/8	2	3	143603	30.71
1/4	1/4	3/4	2-1/2	3	143614	32.92
5/16	5/16	13/16	2-1/2	3	143625	39.83
3/8	3/8	7/8	2-1/2	3	143636	53.32
1/2	1/2	1-1/4	3	3	143647	90.97
5/8	5/8	1-5/8	3-1/2	3	143658	181.04
3/4	3/4	1-5/8	4	3	143669	254.05

## ® CORNER RADIUS - REGULAR LENGTH - 3 FLUTE - 45° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143504	22.90
3/16	3/16	5/8	2	3	.010	143515	27.43
1/4	1/4	3/4	2-1/2	3	.020	143526	29.42
5/16	5/16	13/16	2-1/2	3	.020	143537	35.56
3/8	3/8	7/8	2-1/2	3	.020	143548	47.64
1/2	1/2	1-1/4	3	3	.040	143559	81.23
5/8	5/8	1-5/8	3-1/2	3	.040	143570	154.66
3/4	3/4	1-5/8	4	3	.040	143581	217.04

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143680	28.62
3/16	3/16	5/8	2	3	.010	143691	34.27
1/4	1/4	3/4	2-1/2	3	.020	143702	36.75
5/16	5/16	13/16	2-1/2	3	.020	143713	44.46
3/8	3/8	7/8	2-1/2	3	.020	143724	59.55
1/2	1/2	1-1/4	3	3	.040	143735	101.54
5/8	5/8	1-5/8	3-1/2	3	.040	143746	193.34
3/4	3/4	1-5/8	4	3	.040	143757	271.33

These 45 degree tools are designed to slot and profile in stainless steel and other similar alloys. The 3 flute geometry is designed for higher speeds and feeds while providing a shearing action that produces excellent finishes.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.002	-0.0001, -0.0004	+0.002, -0.002
5/8" - 3/4"	+0.00, -0.003	-0.0001, -0.0004	+0.002, -0.002



# Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	148993	10.05
3/16	3/16	3/8	2	5	149004	17.60
1/4	1/4	1/2	2	5	149015	21.23
5/16	5/16	1/2	2	5	149026	25.50
3/8	3/8	5/8	2	5	149037	41.95
7/16	7/16	5/8	2-1/2	5	149048	47.96
1/2	1/2	5/8	2-1/2	5	149059	55.38
5/8	5/8	3/4	3	5	149070	98.36
3/4	3/4	1	3	5	149081	132.53

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	149092	12.69
3/16	3/16	3/8	2	5	149103	21.07
1/4	1/4	1/2	2	5	149114	25.22
5/16	5/16	1/2	2	5	149125	31.86
3/8	3/8	5/8	2	5	149136	49.92
7/16	7/16	5/8	2-1/2	5	149147	57.08
1/2	1/2	5/8	2-1/2	5	149158	65.98
5/8	5/8	3/4	3	5	149169	119.07
3/4	3/4	1	3	5	149180	163.59

## ® CORNER RADIUS - STUB LENGTH - 5 FLUTE - 45° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	.010	149191	11.21
3/16	3/16	3/8	2	5	.010	149202	19.66
1/4	1/4	1/2	2	5	.020	149213	23.71
5/16	5/16	1/2	2	5	.020	149224	28.46
3/8	3/8	5/8	2	5	.020	149235	46.83
7/16	7/16	5/8	2-1/2	5	.020	149246	53.55
1/2	1/2	5/8	2-1/2	5	.040	149257	61.83
5/8	5/8	3/4	3	5	.040	149268	105.04
3/4	3/4	1	3	5	.040	149279	141.53

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	.010	149290	14.17
3/16	3/16	3/8	2	5	.010	149301	23.54
1/4	1/4	1/2	2	5	.020	149312	28.17
5/16	5/16	1/2	2	5	.020	149323	35.56
3/8	3/8	5/8	2	5	.020	149334	55.73
7/16	7/16	5/8	2-1/2	5	.020	149345	63.76
1/2	1/2	5/8	2-1/2	5	.040	149356	73.65
5/8	5/8	3/4	3	5	.040	149367	127.14
3/4	3/4	1	3	5	.040	149378	174.71

These 5 flute 45° tools are designed for profiling and finishing in all exotic materials, stainless steel, carbon steels and other similar materials. This geometry allows the tool to be run 20 - 40% faster than conventional endmills while providing an excellent finish.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.02, -0.02
5/8" - 3/4"	+0.00, -0.03	-0.001, -0.004	+0.02, -0.02

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	149389	21.39
3/16	3/16	3/4	2	5	149400	26.92
1/4	1/4	3/4	2-1/2	5	149411	28.97
5/16	5/16	7/8	2-1/2	5	149422	34.98
3/8	3/8	7/8	2-1/2	5	149433	46.80
1/2	1/2	1-1/4	3	5	149444	87.37
5/8	5/8	1-5/8	3-1/2	5	149455	165.65
3/4	3/4	1-5/8	4	5	149466	232.94

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	149477	26.76
3/16	3/16	3/4	2	5	149488	32.09
1/4	1/4	3/4	2-1/2	5	149499	34.53
5/16	5/16	7/8	2-1/2	5	149510	41.56
3/8	3/8	7/8	2-1/2	5	149521	55.76
1/2	1/2	1-1/4	3	5	149532	108.70
5/8	5/8	1-5/8	3-1/2	5	149543	210.17
3/4	3/4	1-5/8	4	5	149554	285.75

## ® CORNER RADIUS - REGULAR LENGTH - 5 FLUTE - 45° HELIX



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	.010	150181	23.90
3/16	3/16	3/4	2	5	.010	150192	30.07
1/4	1/4	3/4	2-1/2	5	.020	150203	32.38
5/16	5/16	7/8	2-1/2	5	.020	150214	39.03
3/8	3/8	7/8	2-1/2	5	.020	150225	52.26
1/2	1/2	1-1/4	3	5	.040	150236	97.55
5/8	5/8	1-5/8	3-1/2	5	.040	150247	176.92
3/4	3/4	1-5/8	4	5	.040	150258	248.78

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	.010	150269	29.87
3/16	3/16	3/4	2	5	.010	150280	35.82
1/4	1/4	3/4	2-1/2	5	.020	150291	38.51
5/16	5/16	7/8	2-1/2	5	.020	150302	46.42
3/8	3/8	7/8	2-1/2	5	.020	150313	62.25
1/2	1/2	1-1/4	3	5	.040	150324	121.35
5/8	5/8	1-5/8	3-1/2	5	.040	150335	224.46
3/4	3/4	1-5/8	4	5	.040	150346	305.15

These 5 flute 45° tools are designed for profiling and finishing in all exotic materials, stainless steel, carbon steels and other similar materials. This geometry allows the tool to be run 20 - 40% faster than conventional endmills while providing an excellent finish.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.002	-0.0001, -.0004	+0.002, -.002
5/8" - 3/4"	+0.00, -0.003	-0.0001, -.0004	+0.002, -.002

HIGH PERFORMANCE - CARBIDE ENDMILLS

- CARBIDE MICRO ENDMILLS
- CARBIDE THREADMILLS
- CARBIDE DRILL MILLS
- CARBIDE DRILLS
- CARBIDE REAMERS
- CARBIDE BURS
- COUNTERSINKS
- TAPS & DIES
- HSS & COBALT DRILLS
- HSS & COBALT ENDMILLS
- HSS & COBALT REAMERS



# Solid Carbide Endmills

## FOR ALUMINUM REGULAR LENGTH - 2 FLUTE - SQUARE END - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	149560	20.14
3/16	3/16	5/8	2	2	148562	28.07
1/4	1/4	3/4	2-1/2	2	149565	40.50
5/16	5/16	13/16	2-1/2	2	149576	47.83
3/8	3/8	1	2-1/2	2	149587	50.66
1/2	1/2	1-1/4	3	2	149598	83.84
5/8	5/8	1-5/8	3-1/2	2	149609	160.35
3/4	3/4	1-3/4	4	2	149620	229.83
1	1	1-3/4	4	2	149631	378.93

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	149638	25.18
3/16	3/16	5/8	2	2	149640	35.11
1/4	1/4	3/4	2-1/2	2	149642	48.98
5/16	5/16	13/16	2-1/2	2	149653	57.85
3/8	3/8	1	2-1/2	2	149664	61.22
1/2	1/2	1-1/4	3	2	149675	97.23
5/8	5/8	1-5/8	3-1/2	2	149686	194.33
3/4	3/4	1-3/4	4	2	149697	279.10
1	1	1-3/4	4	2	149708	459.43

## FOR ALUMINUM CORNER RADIUS - REGULAR LENGTH - 2 FLUTE - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	.020	150351	24.06
3/16	3/16	5/8	2	2	.020	150353	33.02
1/4	1/4	3/4	2-1/2	2	.020	150357	45.23
5/16	5/16	13/16	2-1/2	2	.020	150368	53.42
3/8	3/8	1	2-1/2	2	.020	150379	56.57
1/2	1/2	1-1/4	3	2	.040	150390	93.60
5/8	5/8	1-5/8	3-1/2	2	.040	150401	171.24
3/4	3/4	1-3/4	4	2	.040	150412	245.47
1	1	1-3/4	4	2	.040	150423	404.70

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	.020	150430	30.10
3/16	3/16	5/8	2	2	.020	150432	41.28
1/4	1/4	3/4	2-1/2	2	.020	150434	54.67
5/16	5/16	13/16	2-1/2	2	.020	150445	64.60
3/8	3/8	1	2-1/2	2	.020	150456	68.35
1/2	1/2	1-1/4	3	2	.040	150467	108.54
5/8	5/8	1-5/8	3-1/2	2	.040	150478	207.54
3/4	3/4	1-3/4	4	2	.040	150489	298.08
1	1	1-3/4	4	2	.040	150500	490.65

These 2 flute tools are designed specifically for high speed machining in aluminum. This roughing tool will plunge, slot and profile in all non-ferrous materials. ZRN coating does not have an affinity for aluminum and will also work well in brass and bronze applications.

Use our ZRN coated tools for higher speed rates and better tool life.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.02, -0.02
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.02, -0.02

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



## FOR ALUMINUM LONG LENGTH - 2 FLUTE - SQUARE END - 45° HELIX



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	149869	34.21
3/16	3/16	3/4	2-1/2	2	149871	39.44
1/4	1/4	1-1/4	3	2	149873	55.60
5/16	5/16	1-3/8	3	2	149884	71.98
3/8	3/8	1-1/2	4	2	149895	90.16
1/2	1/2	2	4	2	149906	126.33
5/8	5/8	2-3/8	5	2	149917	261.95
3/4	3/4	2-1/2	5	2	149928	287.84
1	1	2-1/4	5	2	149939	473.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	149946	42.75
3/16	3/16	3/4	2-1/2	2	149948	49.31
1/4	1/4	1-1/4	3	2	149950	67.20
5/16	5/16	1-3/8	3	2	149961	91.42
3/8	3/8	1-1/2	4	2	149972	109.05
1/2	1/2	2	4	2	149983	153.19
5/8	5/8	2-3/8	5	2	149994	333.39
3/4	3/4	2-1/2	5	2	150005	360.30
1	1	2-1/4	5	2	150016	567.36

## FOR ALUMINUM CORNER RADIUS - LONG LENGTH - 2 FLUTE - 45° HELIX



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	.020	150507	41.02
3/16	3/16	3/4	2-1/2	2	.020	150509	47.31
1/4	1/4	1-1/4	3	2	.020	150511	62.09
5/16	5/16	1-3/8	3	2	.020	150522	80.37
3/8	3/8	1-1/2	4	2	.020	150533	100.67
1/2	1/2	2	4	2	.040	150544	141.01
5/8	5/8	2-3/8	5	2	.040	150555	279.74
3/4	3/4	2-1/2	5	2	.040	150566	307.37
1	1	2-1/4	5	2	.040	150577	505.33

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	.020	150584	51.30
3/16	3/16	3/4	2-1/2	2	.020	150586	59.17
1/4	1/4	1-1/4	3	2	.020	150588	75.04
5/16	5/16	1-3/8	3	2	.020	150599	102.05
3/8	3/8	1-1/2	4	2	.020	150610	121.77
1/2	1/2	2	4	2	.040	150621	171.05
5/8	5/8	2-3/8	5	2	.040	150632	356.03
3/4	3/4	2-1/2	5	2	.040	150643	384.78
1	1	2-1/4	5	2	.040	150654	605.93

These 2 flute tools are designed specifically for high speed machining in aluminum. This roughing tool will plunge, slot and profile in all non-ferrous materials. ZRN coating does not have an affinity for aluminum and will also work well in brass and bronze applications.

Use our ZRN coated tools for higher speed rates and better tool life.

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



# Solid Carbide Endmills

## FOR ALUMINUM REGULAR LENGTH - 3 FLUTE - SQUARE END - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	149715	20.14
3/16	3/16	5/8	2	3	149717	28.07
1/4	1/4	3/4	2-1/2	3	149719	40.50
5/16	5/16	13/16	2-1/2	3	149730	47.83
3/8	3/8	1	2-1/2	3	149741	50.66
1/2	1/2	1-1/4	3	3	149752	83.84
5/8	5/8	1-5/8	3-1/2	3	149763	160.35
3/4	3/4	1-3/4	4	3	149774	229.83
1	1	1-3/4	4	3	149785	378.93

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	149792	25.18
3/16	3/16	5/8	2	3	149794	35.11
1/4	1/4	3/4	2-1/2	3	149796	48.98
5/16	5/16	13/16	2-1/2	3	149807	57.85
3/8	3/8	1	2-1/2	3	149818	61.22
1/2	1/2	1-1/4	3	3	149829	97.23
5/8	5/8	1-5/8	3-1/2	3	149840	194.33
3/4	3/4	1-3/4	4	3	149851	279.10
1	1	1-3/4	4	3	149862	459.43

## FOR ALUMINUM CORNER RADIUS - REGULAR LENGTH - 3 FLUTE - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.020	150661	24.06
3/16	3/16	5/8	2	3	.020	150663	33.02
1/4	1/4	3/4	2-1/2	3	.020	150665	45.23
5/16	5/16	13/16	2-1/2	3	.020	150676	53.42
3/8	3/8	1	2-1/2	3	.020	150687	56.57
1/2	1/2	1-1/4	3	3	.040	150698	93.60
5/8	5/8	1-5/8	3-1/2	3	.040	150709	171.24
3/4	3/4	1-3/4	4	3	.040	150720	245.47
1	1	1-3/4	4	3	.040	150731	404.70

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.020	150738	30.10
3/16	3/16	5/8	2	3	.020	150740	41.28
1/4	1/4	3/4	2-1/2	3	.020	150742	54.67
5/16	5/16	13/16	2-1/2	3	.020	150753	64.60
3/8	3/8	1	2-1/2	3	.020	150764	68.35
1/2	1/2	1-1/4	3	3	.040	150775	108.54
5/8	5/8	1-5/8	3-1/2	3	.040	150786	207.54
3/4	3/4	1-3/4	4	3	.040	150797	298.08
1	1	1-3/4	4	3	.040	150808	490.65

These 3 flute tools are designed specifically for high speed machining in aluminum. This roughing-finishing tool will plunge, slot and profile in all non-ferrous materials. ZRN coating does not have an affinity for aluminum and will also work well in brass and bronze applications.

Use our ZRN coated tools for higher speed rates and better tool life.

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

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HIGH PERFORMANCE - CARBIDE ENDMILLS

# Solid Carbide Endmills



## FOR ALUMINUM LONG LENGTH - 3 FLUTE - SQUARE END - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	150023	34.21
3/16	3/16	3/4	2-1/2	3	150025	39.44
1/4	1/4	1-1/4	3	3	150027	55.60
5/16	5/16	1-3/8	3	3	150038	71.98
3/8	3/8	1-1/2	4	3	150049	90.16
1/2	1/2	2	4	3	150060	126.33
5/8	5/8	2-3/8	5	3	150071	261.95
3/4	3/4	2-1/2	5	3	150082	287.84
1	1	2-1/4	5	3	150093	473.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	150100	42.66
3/16	3/16	3/4	2-1/2	3	150102	49.31
1/4	1/4	1-1/4	3	3	150104	67.20
5/16	5/16	1-3/8	3	3	150115	91.42
3/8	3/8	1-1/2	4	3	150126	109.05
1/2	1/2	2	4	3	150137	153.19
5/8	5/8	2-3/8	5	3	150148	333.39
3/4	3/4	2-1/2	5	3	150159	360.30
1	1	2-1/4	5	3	150170	567.36

## FOR ALUMINUM CORNER RADIUS - LONG LENGTH - 3 FLUTE - 45° HELIX



**UNCOATED**



**ZRN (ZIRCONIUM NITRIDE) COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	.020	150815	41.02
3/16	3/16	3/4	2-1/2	3	.020	150817	47.31
1/4	1/4	1-1/4	3	3	.020	150819	62.09
5/16	5/16	1-3/8	3	3	.020	150830	80.37
3/8	3/8	1-1/2	4	3	.020	150841	100.67
1/2	1/2	2	4	3	.040	150852	141.01
5/8	5/8	2-3/8	5	3	.040	150863	279.74
3/4	3/4	2-1/2	5	3	.040	150874	307.37
1	1	2-1/4	5	3	.040	150885	505.33

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	.020	150892	51.30
3/16	3/16	3/4	2-1/2	3	.020	150894	59.17
1/4	1/4	1-1/4	3	3	.020	150896	75.04
5/16	5/16	1-3/8	3	3	.020	150907	102.05
3/8	3/8	1-1/2	4	3	.020	150918	121.77
1/2	1/2	2	4	3	.040	150929	171.05
5/8	5/8	2-3/8	5	3	.040	150940	356.03
3/4	3/4	2-1/2	5	3	.040	150951	384.78
1	1	2-1/4	5	3	.040	150962	605.93

These 3 flute tools are designed specifically for high speed machining in aluminum. This roughing-finishing tool will plunge, slot and profile in all non-ferrous materials. ZRN coating does not have an affinity for aluminum and will also work well in brass and bronze applications.

Use our ZRN coated tools for higher speed rates and better tool life.

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



# Solid Carbide Endmills

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	142756	42.91
5/16	5/16	13/16	2-1/2	4	142767	60.23
3/8	3/8	7/8	2-1/2	4	142778	70.25
1/2	1/2	1-1/4	3	4	142789	87.82
5/8	5/8	1-5/8	3-1/2	4	142800	189.71
3/4	3/4	1-5/8	4	4	142811	227.64
1	1	2	4	4	142822	422.75

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	142833	53.61
5/16	5/16	13/16	2-1/2	4	142844	75.29
3/8	3/8	7/8	2-1/2	4	142855	87.82
1/2	1/2	1-1/4	3	4	142866	109.76
5/8	5/8	1-5/8	3-1/2	4	142877	237.12
3/4	3/4	1-5/8	4	4	142888	284.56
1	1	2	4	4	142899	528.43

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	217281	61.99
5/16	5/16	1-1/2	4	4	217292	79.50
3/8	3/8	1-3/4	4	4	217303	99.38
1/2	1/2	2	4	4	217314	112.62
5/8	5/8	2-1/2	5	4	217325	268.98
3/4	3/4	2-1/2	5	4	217336	323.69
1	1	2-1/2	5	4	217347	542.53

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	218645	77.51
5/16	5/16	1-1/2	4	4	218656	99.38
3/8	3/8	1-3/4	4	4	218667	124.24
1/2	1/2	2	4	4	218678	140.88
5/8	5/8	2-1/2	5	4	218689	337.82
3/4	3/4	2-1/2	5	4	218700	405.76
1	1	2-1/2	5	4	218711	679.30

Our fine pitch rougher is designed to remove maximum material with minimum vibration or chatter, while milling faster than conventional finishing endmills.

This tool will work in hardened steels, titanium, inconel and other space age materials.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 1"	+0.000, -0.003	-0.0001, -0.0004

CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HIGH PERFORMANCE - CARBIDE ENDMILLS**

# Solid Carbide Endmills



## ROUGHER / FINISHER - REGULAR LENGTH - 4 FLUTE - 40° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	.020	142910	75.00
5/16	5/16	13/16	2-1/2	4	.020	142921	81.23
3/8	3/8	7/8	2-1/2	4	.020	142932	88.27
1/2	1/2	1-1/4	3	4	.040	142943	102.02
5/8*	5/8	1-5/8	3-1/2	4	.040	142954	203.17
3/4*	3/4	1-5/8	4	4	.040	142965	271.42
1*	1	1-5/8	4	4	.040	142976	442.95

\* WITH WELDON FLATS



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	.020	142987	93.76
5/16	5/16	13/16	2-1/2	4	.020	142998	101.54
3/8	3/8	7/8	2-1/2	4	.020	143009	110.34
1/2	1/2	1-1/4	3	4	.040	143020	127.55
5/8*	5/8	1-5/8	3-1/2	4	.040	143031	253.95
3/4*	3/4	1-5/8	4	4	.040	143042	339.30
1*	1	1-5/8	4	4	.040	143053	553.71

\* WITH WELDON FLATS

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

Works well in hard to machine materials such as stainless steel and titanium.

## SOLID CARBIDE ROUGHERS - SPEEDS & FEEDS

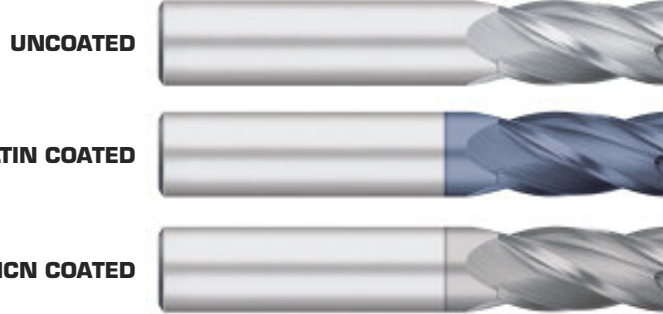
MATERIAL	HARDNESS Hrc	SFM		CHIP LOAD PER TOOTH	
		UNCOATED	ALTiN COATED	1/4" - 1/2"	1/2" - 1"
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	<19	258 - 345	430 - 575	.0015 - .003	.003 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	20 - 30	210 - 258	350 - 430	.0015 - .003	.003 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	31 - 40	126 - 192	210 - 320	.0011 - .0021	.0021 - .0032
AUENSTENITIC STAINLESS STEELS, 200 AND 300 SERIES 135-275	<28	150 - 300	250 - 500	.0010 - .0025	.0025 - .0040
FERRITIC, MARTENSITIC 400, 500, & PH STAINLESS STEELS	<35	135 - 258	225 - 430	.0015 - .0030	.0030 - .0045
TITANIUM ALLOYS	32 - 43	75 - 129	125 - 215	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	<32	39 - 87	65 - 145	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	32 - 50	33 - 66	55 - 110	.0009 - .0018	.0018 - .0027
COBAL-BASED HIGH TEMPERATURE ALLOYS	<45	27 - 45	45 - 75	.0009 - .0018	.0018 - .0027

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



# Solid Carbide Endmills

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	130711	22.77	166329	30.52	163854	30.52
1/32	1/8	1/8	1-1/2	130722	15.26	166340	20.62	163865	20.62
3/64	1/8	1/8	1-1/2	130733	13.04	166351	17.57	163876	17.57
1/16	1/8	1/4	1-1/2	130744	13.01	166362	14.94	163887	14.94
5/64	1/8	1/4	1-1/2	130755	13.43	166373	18.12	163898	18.12
3/32	1/8	3/8	1-1/2	130766	11.82	166384	14.94	163909	14.94
7/64	1/8	3/8	1-1/2	130777	12.33	166395	16.64	163920	16.64
1/8	1/8	1/2	1-1/2	130788	11.34	166406	13.88	163931	13.88
9/64	3/16	9/16	2	130799	16.61	166417	22.42	163942	22.42
5/32	3/16	9/16	2	130810	16.70	166428	19.37	163953	19.37
11/64	3/16	5/8	2	130821	15.87	166439	21.46	163964	21.46
3/16	3/16	5/8	2	130832	15.45	166450	19.37	163975	19.37
13/64	1/4	5/8	2-1/2	130843	22.55	166461	29.55	163986	29.55
7/32	1/4	5/8	2-1/2	130854	23.03	166472	26.76	163997	26.76
15/64	1/4	3/4	2-1/2	130865	26.02	166483	33.53	164008	33.53
1/4	1/4	3/4	2-1/2	130876	19.08	166494	26.76	164019	26.76
17/64	5/16	3/4	2-1/2	130887	34.40	166505	44.20	164030	44.20
9/32	5/16	3/4	2-1/2	130898	34.40	166516	44.20	164041	44.20
19/64	5/16	13/16	2-1/2	130909	34.40	166527	44.20	164052	44.20
5/16	5/16	13/16	2-1/2	130920	24.83	166538	32.02	164063	32.02
21/64	3/8	1	2-1/2	130931	38.58	166549	49.60	164074	49.60
11/32	3/8	1	2-1/2	130942	38.58	166560	49.60	164085	49.60
23/64	3/8	1	2-1/2	130953	38.58	166571	49.60	164096	49.60
3/8	3/8	1	2-1/2	130964	29.62	166582	36.62	164107	36.62
25/64	7/16	1	2-3/4	130975	50.49	166593	65.17	164118	65.17
13/32	7/16	1	2-3/4	130986	50.49	166604	65.17	164129	65.17
27/64	7/16	1	2-3/4	130997	52.13	166615	67.33	164140	67.33
7/16	7/16	1	2-3/4	131008	45.45	166626	55.96	164151	55.96
29/64	1/2	1	3	131019	75.04	166637	96.04	164162	96.04
15/32	1/2	1	3	131030	75.04	166648	96.04	164173	96.04
31/64	1/2	1	3	131041	75.04	166659	96.04	164184	96.04
1/2	1/2	1	3	131052	54.57	166670	68.10	164195	68.10
1/2	1/2	1-1/4	3	131063	54.57	166681	68.10	164206	68.10
9/16	9/16	1-1/4	3-1/2	131074	103.14	166692	136.19	164217	136.19
5/8	5/8	1-1/4	3-1/2	131085	104.33	166703	133.01	164228	133.01
3/4	3/4	1-1/2	4	131096	146.54	166714	188.74	164239	188.74
7/8	7/8	1-1/2	4	131107	268.02	166725	339.23	164250	339.23
1	1	1-1/2	4	131118	239.72	166736	306.63	164261	306.63
1-1/4	1-1/4	2	4-1/2	131129	842.38	166747	957.24	164272	957.24

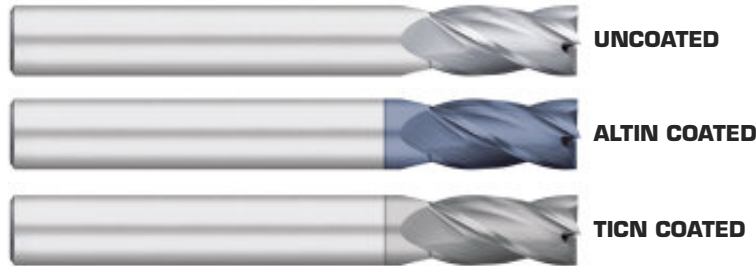
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -.0004
1/8" - 1/2"	+0.00, -0.02	-0.001, -.0004
9/16" - 1-1/4"	+0.00, -0.03	-0.001, -.0004

CARBIDE ENDMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136442	18.31	136596	23.54	165251	23.54
3/16	3/16	3/4	2-1/2	136453	21.49	136607	27.62	165262	27.62
1/4	1/4	1-1/8	3	136464	30.77	136618	39.67	165273	39.67
1/4	1/4	1	4	136475	32.41	136629	41.79	165284	41.79
5/16	5/16	1-1/8	3	136486	34.72	136640	46.86	165295	46.86
3/8	3/8	1-1/8	3	136497	39.83	136651	53.77	165306	53.77
3/8	3/8	1	4	136508	46.51	136662	59.84	165317	59.84
7/16	7/16	2	4	136519	62.76	136673	81.62	165328	81.62
1/2	1/2	1	4	136530	67.97	136684	87.53	165339	87.53
1/2	1/2	2	4	136541	71.98	136695	92.38	165350	92.38
5/8	5/8	2-1/4	5	136552	160.90	136706	199.12	165361	199.12
3/4	3/4	2-1/4	5	136563	222.21	136717	269.00	165372	269.00
7/8	7/8	2-1/4	5	136574	421.17	136728	497.75	165383	497.75
1	1	2-1/4	5	136585	304.22	136739	392.65	165394	392.65

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



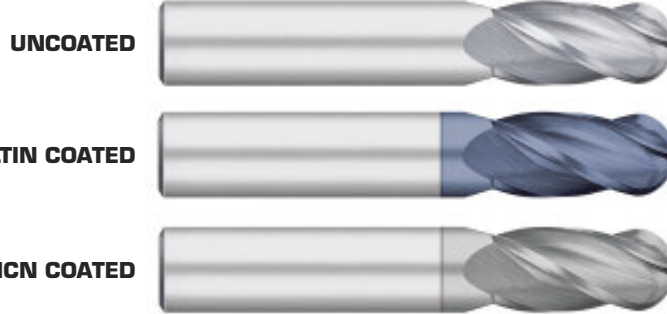
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137674	20.46	137850	27.62	165867	27.62
3/16	3/16	1-1/8	3	137685	22.26	137861	28.59	165878	28.59
1/4	1/4	1-1/2	4	137696	31.45	137872	40.50	165889	40.50
1/4	1/4	1-1/2	6	137707	42.53	137883	54.70	165900	54.70
5/16	5/16	1-5/8	4	137718	42.91	137894	55.38	165911	55.38
3/8	3/8	1-3/4	4	137729	48.73	137905	62.41	165922	62.41
3/8	3/8	1-1/2	6	137740	73.78	137916	95.11	165933	95.11
7/16	7/16	3	6	137751	99.38	137927	127.42	165944	127.42
1/2	1/2	1-1/2	6	137762	112.30	137938	139.37	165955	139.37
1/2	1/2	3	6	137773	117.88	137949	144.96	165966	144.96
5/8	5/8	3	6	137784	173.62	137960	213.45	165977	213.45
3/4	3/4	3	6	137795	258.03	137971	303.00	165988	303.00
3/4	3/4	4	7	137806	442.82	137982	502.00	165993	502.00
7/8	7/8	3	6	137817	459.46	137993	574.36	165999	574.36
1	1	3	6	137828	438.04	138004	489.00	166010	489.00
1	1	4	7	137839	574.23	138015	704.84	166013	704.84

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
5/8" - 1"	+0.00, -0.03	-0.001, -0.004



# Solid Carbide Endmills

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	132779	25.50	133186	34.18	164690	34.18
1/32	1/8	1/8	1-1/2	132790	16.32	133197	21.20	164701	21.20
3/64	1/8	1/8	1-1/2	132801	16.32	133208	21.20	164712	21.20
1/16	1/8	1/4	1-1/2	132812	15.13	133219	20.43	164723	20.43
5/64	1/8	1/4	1-1/2	132823	15.13	133230	20.43	164734	20.43
3/32	1/8	3/8	1-1/2	132834	15.87	133241	21.46	164745	21.46
7/64	1/8	3/8	1-1/2	132845	15.87	133252	21.46	164756	21.46
1/8	1/8	1/2	1-1/2	132856	14.55	133263	19.66	164767	19.66
9/64	3/16	9/16	2	132867	21.33	133274	28.81	164778	28.81
5/32	3/16	9/16	2	132878	21.33	133285	28.81	164789	28.81
11/64	3/16	5/8	2	132889	21.33	133296	28.81	164800	28.81
3/16	3/16	5/8	2	132900	19.18	133307	25.89	164811	25.89
13/64	1/4	5/8	2-1/2	132911	24.86	133318	35.24	164822	35.24
7/32	1/4	5/8	2-1/2	132922	24.86	133329	35.24	164833	35.24
15/64	1/4	3/4	2-1/2	132933	24.86	133340	35.24	164844	35.24
1/4	1/4	3/4	2-1/2	132944	26.05	133351	33.57	164855	33.57
17/64	5/16	3/4	2-1/2	132955	35.24	133362	45.32	164866	45.32
9/32	5/16	3/4	2-1/2	132966	35.30	133373	45.39	164877	45.39
19/64	5/16	13/16	2-1/2	132977	38.35	133384	50.33	164888	50.33
5/16	5/16	13/16	2-1/2	132988	32.47	133395	41.76	164899	41.76
21/64	3/8	1	2-1/2	132999	44.62	133406	60.23	164910	60.23
11/32	3/8	1	2-1/2	133010	46.83	133417	60.23	164921	60.23
23/64	3/8	1	2-1/2	133021	44.62	133428	60.23	164932	60.23
3/8	3/8	1	2-1/2	133032	34.76	133439	49.11	164943	49.11
25/64	7/16	1	2-3/4	133043	60.42	133450	77.86	164954	77.86
13/32	7/16	1	2-3/4	133054	60.42	133461	77.86	164965	77.86
27/64	7/16	1	2-3/4	133065	60.42	133472	77.86	164976	77.86
7/16	7/16	1	2-3/4	133076	51.43	133483	66.30	164987	66.30
29/64	1/2	1	3	133087	79.66	133494	102.72	164998	102.72
15/32	1/2	1	3	133098	79.66	133505	102.72	165009	102.72
31/64	1/2	1	3	133109	79.66	133516	102.72	165020	102.72
1/2	1/2	1	3	133120	70.54	133527	90.90	165031	90.90
9/16	9/16	1-1/4	3-1/2	133131	107.51	133538	132.31	165042	132.31
5/8	5/8	1-1/4	3-1/2	133142	114.06	133549	147.02	165053	147.02
3/4	3/4	1-1/2	4	133153	168.06	133560	219.00	165064	219.00
7/8	7/8	1-1/2	4	133164	325.45	133571	413.53	165075	413.53
1	1	1-1/2	4	133175	300.17	133582	386.80	165086	386.80

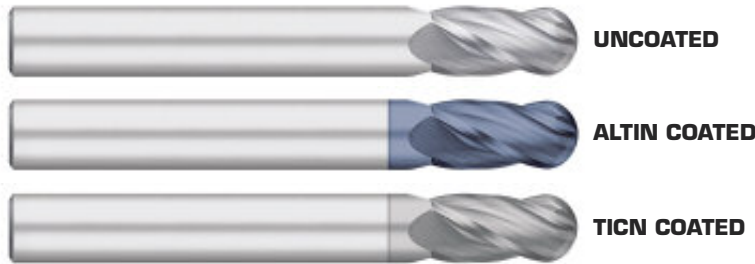
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
9/16" - 1"	+0.00, -0.03	-0.001, -0.004

CARBIDE ENDMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills

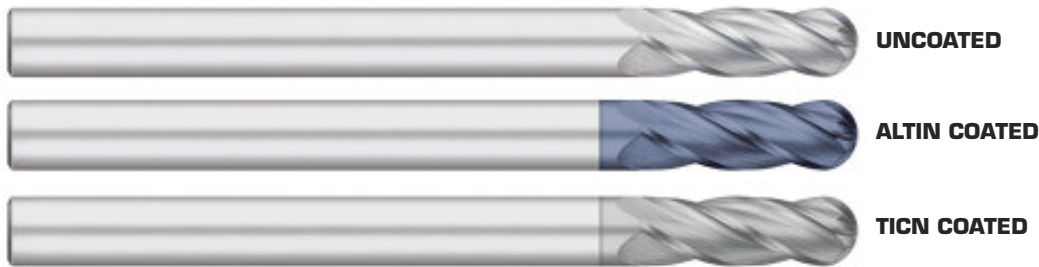


## LONG LENGTH - 4 FLUTE - BALL NOSE - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	137058	21.78	137212	28.01	165559	28.01
3/16	3/16	3/4	2-1/2	137069	25.05	137223	32.19	165570	32.19
1/4	1/4	1-1/8	3	137080	35.24	137234	45.36	165581	45.36
1/4	1/4	1	4	137091	38.90	137245	50.14	165592	50.14
5/16	5/16	1-1/8	3	137102	41.44	137256	55.92	165603	55.92
3/8	3/8	1-1/8	3	137113	47.83	137267	64.60	165614	64.60
3/8	3/8	1	4	137124	58.59	137278	76.13	165625	76.13
7/16	7/16	2	4	137135	80.11	137289	104.17	165636	104.17
1/2	1/2	1	4	137146	82.04	137300	104.33	165647	104.33
1/2	1/2	2	4	137157	82.84	137311	105.13	165658	105.13
5/8	5/8	2-1/4	5	137168	188.74	137322	239.72	165669	239.72
3/4	3/4	2-1/4	5	137179	262.82	137333	332.90	165680	332.90
7/8	7/8	2-1/4	5	137190	451.82	137344	555.22	165691	555.22
1	1	2-1/4	5	137201	520.04	137355	639.53	165702	639.53

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



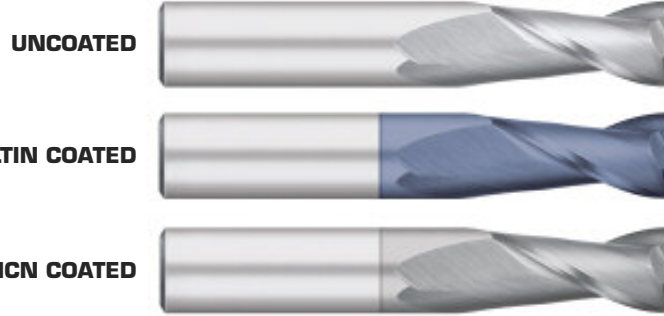
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	138334	24.38	138510	32.89	166175	32.89
3/16	3/16	1-1/8	3	138345	26.69	138521	34.34	166186	34.34
1/4	1/4	1-1/2	4	138356	36.01	138532	46.32	166197	46.32
1/4	1/4	1-1/2	6	138367	43.52	138543	55.99	166208	55.99
5/16	5/16	1-5/8	4	138378	51.78	138554	66.84	166219	66.84
3/8	3/8	1-3/4	4	138389	55.73	138565	71.24	166230	71.24
3/8	3/8	1-1/2	6	138400	78.54	138576	97.97	166241	97.97
7/16	7/16	3	6	138411	117.88	138587	151.32	166252	151.32
1/2	1/2	1-1/2	6	138422	125.05	138598	160.09	166263	160.09
1/2	1/2	3	6	138433	125.82	138609	162.47	166274	162.47
5/8	5/8	3	6	138444	198.32	138620	243.70	166285	243.70
3/4	3/4	3	6	138455	281.22	138631	379.64	166296	379.64
3/4	3/4	4	7	138466	463.06	138642	585.63	166303	585.63
7/8	7/8	3	6	138477	497.75	138653	620.29	166307	620.29
1	1	3	6	138488	501.73	138664	645.96	166318	645.96
1	1	4	7	138499	606.87	138675	722.76	166323	722.76

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
5/8" - 1"	+0.00, -0.03	-0.001, -0.004



# Solid Carbide Endmills

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	129567	22.77	129974	30.52	163447	30.52
1/32	1/8	1/8	1-1/2	129578	15.26	129985	20.62	163458	20.62
3/64	1/8	1/8	1-1/2	129589	13.04	129996	17.57	163469	17.57
1/16	1/8	1/4	1-1/2	129600	13.01	130007	14.94	163480	14.94
5/64	1/8	1/4	1-1/2	129611	13.43	130018	18.12	163491	18.12
3/32	1/8	3/8	1-1/2	129622	11.82	130029	14.94	163502	14.94
7/64	1/8	3/8	1-1/2	129633	12.33	130040	16.64	163513	16.64
1/8	1/8	1/2	1-1/2	129644	11.34	130051	13.88	163524	13.88
9/64	3/16	9/16	2	129655	16.61	130062	22.42	163535	22.42
5/32	3/16	9/16	2	129666	16.70	130073	19.37	163546	19.37
11/64	3/16	5/8	2	129677	15.87	130084	21.46	163557	21.46
3/16	3/16	5/8	2	129688	15.45	130095	19.37	163568	19.37
13/64	1/4	5/8	2-1/2	129699	22.55	130106	29.55	163579	29.55
7/32	1/4	5/8	2-1/2	129710	23.03	130117	26.76	163590	26.76
15/64	1/4	3/4	2-1/2	129721	26.02	130128	33.53	163601	33.53
1/4	1/4	3/4	2-1/2	129732	19.08	130139	26.76	163612	26.76
17/64	5/16	3/4	2-1/2	129743	34.40	130150	44.20	163623	44.20
9/32	5/16	3/4	2-1/2	129754	34.40	130161	44.20	163634	44.20
19/64	5/16	13/16	2-1/2	129765	34.40	130172	44.20	163645	44.20
5/16	5/16	13/16	2-1/2	129776	24.83	130183	32.02	163656	32.02
21/64	3/8	1	2-1/2	129787	38.58	130194	49.60	163667	49.60
11/32	3/8	1	2-1/2	129798	38.58	130205	49.60	163678	49.60
23/64	3/8	1	2-1/2	129809	38.58	130216	49.60	163689	49.60
3/8	3/8	1	2-1/2	129820	29.62	130227	36.62	163700	36.62
25/64	7/16	1	2-3/4	129831	50.49	130238	65.17	163711	65.17
13/32	7/16	1	2-3/4	129842	50.49	130249	65.17	163722	65.17
27/64	7/16	1	2-3/4	129853	52.13	130260	67.33	163733	67.33
7/16	7/16	1	2-3/4	129864	45.45	130271	55.96	163744	55.96
29/64	1/2	1	3	129875	75.04	130282	96.04	163755	96.04
15/32	1/2	1	3	129886	75.04	130293	96.04	163766	96.04
31/64	1/2	1	3	129897	75.04	130304	96.04	163777	96.04
1/2	1/2	1	3	129908	54.57	130315	68.10	163788	68.10
9/16	9/16	1-1/4	3-1/2	129919	103.14	130326	136.19	163799	136.19
5/8	5/8	1-1/4	3-1/2	129930	104.33	130337	133.01	163810	133.01
3/4	3/4	1-1/2	4	129941	146.54	130348	188.74	163821	188.74
7/8	7/8	1-1/2	4	129952	268.02	130359	339.23	163832	339.23
1	1	1-1/2	4	129963	239.72	130370	306.63	163843	306.63

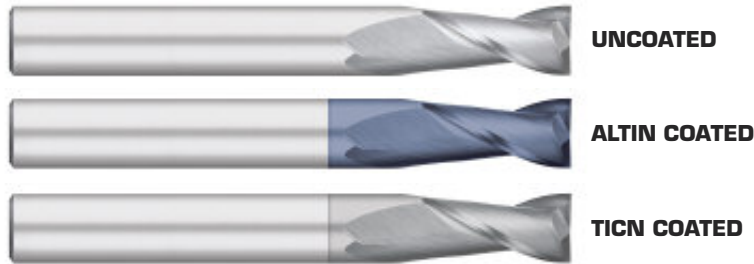
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
9/16" - 1"	+0.00, -0.03	-0.001, -0.004

CARBIDE ENDMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills

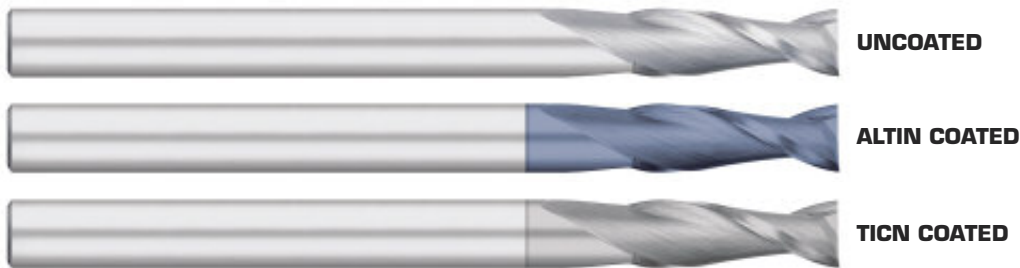


## LONG LENGTH - 2 FLUTE - SQUARE END - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	3/4	2-1/4	136134	18.31	136288	23.54	165097	23.54
3/16	3/16	3/4	2-1/2	136145	21.49	136299	27.62	165108	27.62
1/4	1/4	1-1/8	3	136156	30.77	136310	39.67	165119	39.67
1/4	1/4	1	4	136167	32.41	136321	41.79	165130	41.79
5/16	5/16	1-1/8	3	136178	34.72	136332	46.86	165141	46.86
3/8	3/8	1-1/8	3	136189	39.83	136343	53.77	165152	53.77
3/8	3/8	1	4	136200	46.51	136354	59.84	165163	59.84
7/16	7/16	2	4	136211	62.76	136365	81.62	165174	81.62
1/2	1/2	1	4	136222	67.97	136376	87.53	165185	87.53
1/2	1/2	2	4	136233	71.98	136387	92.38	165196	92.38
5/8	5/8	2-1/4	5	136244	160.90	136398	199.12	165207	199.12
3/4	3/4	2-1/4	5	136255	222.21	136409	286.71	165218	286.71
7/8	7/8	2-1/4	5	136266	421.17	136420	497.75	165229	497.75
1	1	2-1/4	5	136277	304.22	136431	392.65	165240	392.65

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



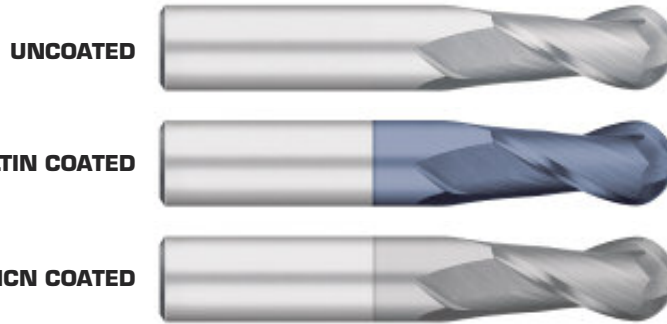
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	1	3	137366	20.46	137520	27.62	165713	27.62
3/16	3/16	1-1/8	3	137377	22.26	137531	28.59	165724	28.59
1/4	1/4	1-1/2	4	137388	31.45	137542	40.50	165735	40.50
1/4	1/4	1-1/2	6	137399	42.53	137553	54.70	165746	54.70
5/16	5/16	1-5/8	4	137410	42.91	137564	55.38	165757	55.38
3/8	3/8	1-3/4	4	137421	48.73	137575	62.41	165768	62.41
3/8	3/8	1-1/2	6	137432	73.78	137586	95.11	165779	95.11
7/16	7/16	3	6	137443	99.38	137597	127.42	165790	127.42
1/2	1/2	1-1/2	6	137454	112.30	137608	139.37	165801	139.37
1/2	1/2	3	6	137465	117.88	137619	144.96	165812	144.96
5/8	5/8	3	6	137476	173.62	137630	213.45	165823	213.45
3/4	3/4	3	6	137487	258.03	137641	316.97	165834	316.97
7/8	7/8	3	6	137498	459.46	137652	574.36	165845	574.36
1	1	3	6	137509	438.04	137663	538.29	165856	538.29

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



# Solid Carbide Endmills

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	131635	25.50	132042	34.18	164283	34.18
1/32	1/8	1/8	1-1/2	131646	16.32	132053	21.20	164294	21.20
3/64	1/8	1/8	1-1/2	131657	16.32	132064	21.20	164305	21.20
1/16	1/8	1/4	1-1/2	131668	15.13	132075	20.43	164316	20.43
5/64	1/8	1/4	1-1/2	131679	15.13	132086	20.43	164327	20.43
3/32	1/8	3/8	1-1/2	131690	15.87	132097	21.46	164338	21.46
7/64	1/8	3/8	1-1/2	131701	15.87	132108	21.46	164349	21.46
1/8	1/8	1/2	1-1/2	131712	14.55	132119	19.66	164360	19.66
9/64	3/16	9/16	2	131723	21.33	132130	28.81	164371	28.81
5/32	3/16	9/16	2	131734	21.33	132141	28.81	164382	28.81
11/64	3/16	5/8	2	131745	21.33	132152	28.81	164393	28.81
3/16	3/16	5/8	2	131756	19.18	132163	25.89	164404	25.89
13/64	1/4	5/8	2-1/2	131767	24.86	132174	35.24	164415	35.24
7/32	1/4	5/8	2-1/2	131778	24.86	132185	35.24	164426	35.24
15/64	1/4	3/4	2-1/2	131789	24.86	132196	35.24	164437	35.24
1/4	1/4	3/4	2-1/2	131800	26.05	132207	33.57	164448	33.57
17/64	5/16	3/4	2-1/2	131811	35.24	132218	45.32	164459	45.32
9/32	5/16	3/4	2-1/2	131822	35.30	132229	45.39	164470	45.39
19/64	5/16	13/16	2-1/2	131833	38.35	132240	50.33	164481	50.33
5/16	5/16	13/16	2-1/2	131844	32.47	132251	41.76	164492	41.76
21/64	3/8	1	2-1/2	131855	44.62	132262	60.23	164503	60.23
11/32	3/8	1	2-1/2	131866	46.83	132273	60.23	164514	60.23
23/64	3/8	1	2-1/2	131877	44.62	132284	60.23	164525	60.23
3/8	3/8	1	2-1/2	131888	34.76	132295	49.11	164536	49.11
25/64	7/16	1	2-3/4	131899	60.42	132306	77.86	164547	77.86
13/32	7/16	1	2-3/4	131910	60.42	132317	77.86	164558	77.86
27/64	7/16	1	2-3/4	131921	60.42	132328	77.86	164569	77.86
7/16	7/16	1	2-3/4	131932	51.43	132339	66.30	164580	66.30
29/64	1/2	1	3	131943	79.66	132350	102.72	164591	102.72
15/32	1/2	1	3	131954	79.66	132361	102.72	164602	102.72
31/64	1/2	1	3	131965	79.66	132372	102.72	164613	102.72
1/2	1/2	1	3	131976	70.54	132383	90.90	164624	90.90
9/16	9/16	1-1/4	3-1/2	131987	107.51	132394	132.31	164635	132.31
5/8	5/8	1-1/4	3-1/2	131998	114.06	132405	147.02	164646	147.02
3/4	3/4	1-1/2	4	132009	168.06	132416	219.00	164657	219.00
7/8	7/8	1-1/2	4	132020	325.45	132427	413.53	164668	413.53
1	1	1-1/2	4	132031	300.17	132438	386.80	164679	386.80

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
9/16" - 1"	+0.00, -0.03	-0.001, -0.004

CARBIDE ENDMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



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



UNCOATED



ALTiN COATED



TiCN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	3/4	2-1/4	136750	21.78	136904	28.01	165405	28.01
3/16	3/16	3/4	2-1/2	136761	25.05	136915	32.19	165416	32.19
1/4	1/4	1-1/8	3	136772	35.24	136926	45.36	165427	45.36
1/4	1/4	1	4	136783	38.90	136937	50.14	165438	50.14
5/16	5/16	1-1/8	3	136794	41.44	136948	55.92	165449	55.92
3/8	3/8	1-1/8	3	136805	47.83	136959	64.60	165460	64.60
3/8	3/8	1	4	136816	58.59	136970	76.13	165471	76.13
7/16	7/16	2	4	136827	80.11	136981	104.17	165482	104.17
1/2	1/2	1	4	136838	82.04	136992	104.33	165493	104.33
1/2	1/2	2	4	136849	82.84	137003	105.13	165504	105.13
5/8	5/8	2-1/4	5	136860	188.74	137014	239.72	165515	239.72
3/4	3/4	2-1/4	5	136871	262.82	137025	332.90	165526	332.90
7/8	7/8	2-1/4	5	136882	451.82	137036	555.22	165537	555.22
1	1	2-1/4	5	136893	520.04	137047	639.53	165548	639.53

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



UNCOATED



ALTiN COATED



TiCN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	1	3	138026	24.38	138180	32.89	166021	32.89
3/16	3/16	1-1/8	3	138037	26.69	138191	34.34	166032	34.34
1/4	1/4	1-1/2	4	138048	36.01	138202	46.32	166043	46.32
1/4	1/4	1-1/2	6	138059	43.52	138213	55.99	166054	55.99
5/16	5/16	1-5/8	4	138070	51.78	138224	66.84	166065	66.84
3/8	3/8	1-3/4	4	138081	55.73	138235	71.24	166076	71.24
3/8	3/8	1-1/2	6	138092	78.54	138246	96.40	166087	96.40
7/16	7/16	3	6	138103	117.88	138257	151.32	166098	151.32
1/2	1/2	1-1/2	6	138114	125.05	138268	160.09	166109	160.09
1/2	1/2	3	6	138125	125.82	138279	160.90	166120	160.90
5/8	5/8	3	6	138136	198.32	138290	243.70	166131	243.70
3/4	3/4	3	6	138147	281.22	138301	379.64	166142	379.64
7/8	7/8	3	6	138158	497.75	138312	620.29	166153	620.29
1	1	3	6	138169	501.73	138323	645.96	166164	645.96

TOLERANCES	DIAMETER	SHANK
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 1"	+0.000, -0.003	-0.0001, -0.0004



# Solid Carbide Endmills

## Ⓡ CORNER RADIUS - REGULAR LENGTH - 2 FLUTE - 30° HELIX



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	150973	16.41
1/8	1/8	1/2	1-1/2	.020	150984	16.41
1/8	1/8	1/2	1-1/2	.030	150995	16.41
3/16	3/16	5/8	2	.015	151006	16.41
3/16	3/16	5/8	2	.020	151017	16.41
3/16	3/16	5/8	2	.030	151028	16.41
1/4	1/4	3/4	2-1/2	.015	151039	23.90
1/4	1/4	3/4	2-1/2	.020	151050	23.90
1/4	1/4	3/4	2-1/2	.030	151061	23.90
1/4	1/4	3/4	2-1/2	.045	151072	23.90
1/4	1/4	3/4	2-1/2	.060	151083	23.90
5/16	5/16	13/16	2-1/2	.015	151094	36.65
5/16	5/16	13/16	2-1/2	.020	151105	36.65
5/16	5/16	13/16	2-1/2	.030	151116	36.65
5/16	5/16	13/16	2-1/2	.045	151127	36.65
5/16	5/16	13/16	2-1/2	.060	151138	36.65
3/8	3/8	1	2-1/2	.015	151149	49.11
3/8	3/8	1	2-1/2	.020	151160	49.11
3/8	3/8	1	2-1/2	.030	151171	49.11
3/8	3/8	1	2-1/2	.045	151182	49.11
3/8	3/8	1	2-1/2	.060	151193	49.11
1/2	1/2	1	3	.015	151204	84.48
1/2	1/2	1	3	.020	151215	84.48
1/2	1/2	1	3	.030	151226	84.48

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	.045	151237	84.48
1/2	1/2	1	3	.060	151248	84.48
1/2	1/2	1	3	.090	151259	84.48
1/2	1/2	1	3	.125	151270	84.48
5/8	5/8	1-1/4	3-1/2	.015	151281	119.52
5/8	5/8	1-1/4	3-1/2	.020	151292	119.52
5/8	5/8	1-1/4	3-1/2	.030	151303	119.52
5/8	5/8	1-1/4	3-1/2	.045	151314	119.52
5/8	5/8	1-1/4	3-1/2	.060	151325	119.52
5/8	5/8	1-1/4	3-1/2	.090	151336	119.52
3/4	3/4	1-1/2	4	.015	151347	176.83
3/4	3/4	1-1/2	4	.020	151358	176.83
3/4	3/4	1-1/2	4	.030	151369	176.83
3/4	3/4	1-1/2	4	.045	151380	176.83
3/4	3/4	1-1/2	4	.060	151391	176.83
3/4	3/4	1-1/2	4	.090	151402	176.83
3/4	3/4	1-1/2	4	.125	151413	176.83
1	1	1-1/2	4	.015	151424	334.57
1	1	1-1/2	4	.020	151435	334.57
1	1	1-1/2	4	.030	151446	334.57
1	1	1-1/2	4	.045	151457	334.57
1	1	1-1/2	4	.060	151468	334.57
1	1	1-1/2	4	.090	151479	334.57
1	1	1-1/2	4	.125	151490	334.57

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

CARBIDE ENDMILLS  
 CARBIDE REAMERS  
 CARBIDE DRILLS  
 CARBIDE DRILL MILLS  
 CARBIDE THREADMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



## Ⓜ CORNER RADIUS - REGULAR LENGTH - 2 FLUTE - 30° HELIX



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	151501	25.50
1/8	1/8	1/2	1-1/2	.020	151512	25.50
1/8	1/8	1/2	1-1/2	.030	151523	25.50
3/16	3/16	5/8	2	.015	151534	25.50
3/16	3/16	5/8	2	.020	151545	25.50
3/16	3/16	5/8	2	.030	151556	25.50
1/4	1/4	3/4	2-1/2	.015	151567	35.04
1/4	1/4	3/4	2-1/2	.020	151578	35.04
1/4	1/4	3/4	2-1/2	.030	151589	35.04
1/4	1/4	3/4	2-1/2	.045	151600	35.04
1/4	1/4	3/4	2-1/2	.060	151611	35.04
5/16	5/16	13/16	2-1/2	.015	151622	50.40
5/16	5/16	13/16	2-1/2	.020	151633	50.40
5/16	5/16	13/16	2-1/2	.030	151644	50.40
5/16	5/16	13/16	2-1/2	.045	151655	50.40
5/16	5/16	13/16	2-1/2	.060	151666	50.40
3/8	3/8	1	2-1/2	.015	151677	54.61
3/8	3/8	1	2-1/2	.020	151688	54.61
3/8	3/8	1	2-1/2	.030	151699	54.61
3/8	3/8	1	2-1/2	.045	151710	54.61
3/8	3/8	1	2-1/2	.060	151721	54.61
1/2	1/2	1	3	.015	151732	91.45
1/2	1/2	1	3	.020	151743	91.45
1/2	1/2	1	3	.030	151754	91.45

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	.045	151765	91.45
1/2	1/2	1	3	.060	151776	91.45
1/2	1/2	1	3	.090	151787	91.45
1/2	1/2	1	3	.125	151798	91.45
5/8	5/8	1-1/4	3-1/2	.015	151809	131.60
5/8	5/8	1-1/4	3-1/2	.020	151820	131.60
5/8	5/8	1-1/4	3-1/2	.030	151831	131.60
5/8	5/8	1-1/4	3-1/2	.045	151842	131.60
5/8	5/8	1-1/4	3-1/2	.060	151853	131.60
5/8	5/8	1-1/4	3-1/2	.090	151864	131.60
3/4	3/4	1-1/2	4	.015	151875	184.79
3/4	3/4	1-1/2	4	.020	151886	184.79
3/4	3/4	1-1/2	4	.030	151897	184.79
3/4	3/4	1-1/2	4	.045	151908	184.79
3/4	3/4	1-1/2	4	.060	151919	184.79
3/4	3/4	1-1/2	4	.090	151930	184.79
3/4	3/4	1-1/2	4	.125	151941	184.79
1	1	1-1/2	4	.015	151952	385.68
1	1	1-1/2	4	.020	151963	385.68
1	1	1-1/2	4	.030	151974	385.68
1	1	1-1/2	4	.045	151985	385.68
1	1	1-1/2	4	.060	151996	385.68
1	1	1-1/2	4	.090	152007	385.68
1	1	1-1/2	4	.125	152018	385.68

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



# Solid Carbide Endmills

## Ⓡ CORNER RADIUS - REGULAR LENGTH - 4 FLUTE - 30° HELIX



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	152029	16.41
1/8	1/8	1/2	1-1/2	.020	152040	16.41
1/8	1/8	1/2	1-1/2	.030	152051	16.41
3/16	3/16	5/8	2	.015	152062	16.41
3/16	3/16	5/8	2	.020	152073	16.41
3/16	3/16	5/8	2	.030	152084	16.41
1/4	1/4	3/4	2-1/2	.015	152095	23.90
1/4	1/4	3/4	2-1/2	.020	152106	23.90
1/4	1/4	3/4	2-1/2	.030	152117	23.90
1/4	1/4	3/4	2-1/2	.045	152128	23.90
1/4	1/4	3/4	2-1/2	.060	152139	23.90
5/16	5/16	13/16	2-1/2	.015	152150	38.00
5/16	5/16	13/16	2-1/2	.020	152161	38.00
5/16	5/16	13/16	2-1/2	.030	152172	38.00
5/16	5/16	13/16	2-1/2	.045	152183	38.00
5/16	5/16	13/16	2-1/2	.060	152194	38.00
3/8	3/8	1	2-1/2	.015	152205	45.00
3/8	3/8	1	2-1/2	.020	152216	45.00
3/8	3/8	1	2-1/2	.030	152227	45.00
3/8	3/8	1	2-1/2	.045	152238	45.00
3/8	3/8	1	2-1/2	.060	152249	45.00
1/2	1/2	1	3	.015	152260	77.00
1/2	1/2	1	3	.020	152271	77.00
1/2	1/2	1	3	.030	152282	77.00

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	.045	152293	77.00
1/2	1/2	1	3	.060	152304	77.00
1/2	1/2	1	3	.090	152315	77.00
1/2	1/2	1	3	.125	152326	77.00
5/8	5/8	1-1/4	3-1/2	.015	152337	119.52
5/8	5/8	1-1/4	3-1/2	.020	152348	119.52
5/8	5/8	1-1/4	3-1/2	.030	152359	119.52
5/8	5/8	1-1/4	3-1/2	.045	152370	119.52
5/8	5/8	1-1/4	3-1/2	.060	152381	119.52
5/8	5/8	1-1/4	3-1/2	.090	152392	119.52
3/4	3/4	1-1/2	4	.015	152403	176.83
3/4	3/4	1-1/2	4	.020	152414	176.83
3/4	3/4	1-1/2	4	.030	152425	176.83
3/4	3/4	1-1/2	4	.045	152436	176.83
3/4	3/4	1-1/2	4	.060	152447	176.83
3/4	3/4	1-1/2	4	.090	152458	176.83
3/4	3/4	1-1/2	4	.125	152469	176.83
1	1	1-1/2	4	.015	152480	334.57
1	1	1-1/2	4	.020	152491	334.57
1	1	1-1/2	4	.030	152502	334.57
1	1	1-1/2	4	.045	152513	334.57
1	1	1-1/2	4	.060	152524	334.57
1	1	1-1/2	4	.090	152535	334.57
1	1	1-1/2	4	.125	152546	334.57

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004	+0.002, -.002
5/8" - 1"	+0.00, -.003	-.0001, -.0004	+0.002, -.002

CARBIDE ENDMILLS  
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 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



## Ⓡ CORNER RADIUS - REGULAR LENGTH - 4 FLUTE - 30° HELIX



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	152557	25.50
1/8	1/8	1/2	1-1/2	.020	152568	25.50
1/8	1/8	1/2	1-1/2	.030	152579	25.50
3/16	3/16	5/8	2	.015	152590	25.50
3/16	3/16	5/8	2	.020	152601	25.50
3/16	3/16	5/8	2	.030	152612	25.50
1/4	1/4	3/4	2-1/2	.015	152623	35.04
1/4	1/4	3/4	2-1/2	.020	152634	35.04
1/4	1/4	3/4	2-1/2	.030	152645	35.04
1/4	1/4	3/4	2-1/2	.045	152656	35.04
1/4	1/4	3/4	2-1/2	.060	152667	35.04
5/16	5/16	13/16	2-1/2	.015	152678	47.00
5/16	5/16	13/16	2-1/2	.020	152689	47.00
5/16	5/16	13/16	2-1/2	.030	152700	47.00
5/16	5/16	13/16	2-1/2	.045	152711	47.00
5/16	5/16	13/16	2-1/2	.060	152722	47.00
3/8	3/8	1	2-1/2	.015	152733	59.00
3/8	3/8	1	2-1/2	.020	152744	59.00
3/8	3/8	1	2-1/2	.030	152755	59.00
3/8	3/8	1	2-1/2	.045	152766	59.00
3/8	3/8	1	2-1/2	.060	152777	59.00
1/2	1/2	1	3	.015	152788	89.00
1/2	1/2	1	3	.020	152799	89.00
1/2	1/2	1	3	.030	152810	89.00

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	.045	152821	89.00
1/2	1/2	1	3	.060	152832	89.00
1/2	1/2	1	3	.090	152843	89.00
1/2	1/2	1	3	.125	152854	89.00
5/8	5/8	1-1/4	3-1/2	.015	152865	145.00
5/8	5/8	1-1/4	3-1/2	.020	152876	145.00
5/8	5/8	1-1/4	3-1/2	.030	152887	145.00
5/8	5/8	1-1/4	3-1/2	.045	152898	145.00
5/8	5/8	1-1/4	3-1/2	.060	152909	145.00
5/8	5/8	1-1/4	3-1/2	.090	152920	145.00
3/4	3/4	1-1/2	4	.015	152931	199.00
3/4	3/4	1-1/2	4	.020	152942	199.00
3/4	3/4	1-1/2	4	.030	152953	199.00
3/4	3/4	1-1/2	4	.045	152964	199.00
3/4	3/4	1-1/2	4	.060	152975	199.00
3/4	3/4	1-1/2	4	.090	152986	199.00
3/4	3/4	1-1/2	4	.125	152997	199.00
1	1	1-1/2	4	.015	153008	385.68
1	1	1-1/2	4	.020	153019	385.68
1	1	1-1/2	4	.030	153030	385.68
1	1	1-1/2	4	.045	153041	385.68
1	1	1-1/2	4	.060	153052	385.68
1	1	1-1/2	4	.090	153063	385.68
1	1	1-1/2	4	.125	153074	385.68

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



# Solid Carbide Endmills

## Ⓜ CORNER RADIUS - LONG LENGTH - 4 FLUTE - 30° HELIX



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153085	22.42
1/8	1/8	3/4	2-1/4	0.020	153096	22.42
1/8	1/8	3/4	2-1/4	0.030	153107	22.42
3/16	3/16	3/4	2-1/2	0.015	153118	26.06
3/16	3/16	3/4	2-1/2	0.020	153129	26.06
3/16	3/16	3/4	2-1/2	0.030	153140	26.06
1/4	1/4	1-1/8	3	0.015	153151	36.36
1/4	1/4	1-1/8	3	0.020	153162	36.36
1/4	1/4	1-1/8	3	0.030	153173	36.36
1/4	1/4	1-1/8	3	0.045	153184	36.36
1/4	1/4	1-1/8	3	0.060	153195	36.36
1/4	1/4	1	4	0.015	153206	38.18
1/4	1/4	1	4	0.020	153217	38.18
1/4	1/4	1	4	0.030	153228	38.18
1/4	1/4	1	4	0.045	153239	38.18
1/4	1/4	1	4	0.060	153250	38.18
5/16	5/16	1-1/8	3	0.015	153261	41.21
5/16	5/16	1-1/8	3	0.020	153272	41.21
5/16	5/16	1-1/8	3	0.030	153283	41.21
5/16	5/16	1-1/8	3	0.045	153294	41.21
5/16	5/16	1-1/8	3	0.060	153305	41.21
3/8	3/8	1-1/8	3	0.015	153316	53.00
3/8	3/8	1-1/8	3	0.020	153327	53.00
3/8	3/8	1-1/8	3	0.030	153338	53.00
3/8	3/8	1-1/8	3	0.045	153349	53.00
3/8	3/8	1-1/8	3	0.060	153360	53.00
3/8	3/8	1	4	0.015	153371	64.80
3/8	3/8	1	4	0.020	153382	64.80
3/8	3/8	1	4	0.030	153393	64.80
3/8	3/8	1	4	0.045	153404	64.80
3/8	3/8	1	4	0.060	153415	64.80
1/2	1/2	1	4	0.015	153426	91.00
1/2	1/2	1	4	0.020	153437	91.00

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	153448	91.00
1/2	1/2	1	4	0.045	153459	91.00
1/2	1/2	1	4	0.060	153470	91.00
1/2	1/2	1	4	0.090	153481	91.00
1/2	1/2	1	4	0.125	153492	91.00
1/2	1/2	2	4	0.015	153503	97.00
1/2	1/2	2	4	0.020	153514	97.00
1/2	1/2	2	4	0.030	153525	97.00
1/2	1/2	2	4	0.045	153536	97.00
1/2	1/2	2	4	0.060	153547	97.00
1/2	1/2	2	4	0.090	153558	97.00
1/2	1/2	2	4	0.125	153569	97.00
5/8	5/8	2-1/4	5	0.015	153580	172.12
5/8	5/8	2-1/4	5	0.020	153591	172.12
5/8	5/8	2-1/4	5	0.030	153602	172.12
5/8	5/8	2-1/4	5	0.045	153613	172.12
5/8	5/8	2-1/4	5	0.060	153624	172.12
5/8	5/8	2-1/4	5	0.090	153635	172.12
3/4	3/4	2-1/4	5	0.015	153646	240.00
3/4	3/4	2-1/4	5	0.020	153657	240.00
3/4	3/4	2-1/4	5	0.030	153668	240.00
3/4	3/4	2-1/4	5	0.045	153679	240.00
3/4	3/4	2-1/4	5	0.060	153690	240.00
3/4	3/4	2-1/4	5	0.090	153701	240.00
3/4	3/4	2-1/4	5	0.125	153712	240.00
1	1	2-1/4	5	0.015	153723	352.00
1	1	2-1/4	5	0.020	153734	352.00
1	1	2-1/4	5	0.030	153745	352.00
1	1	2-1/4	5	0.045	153756	352.00
1	1	2-1/4	5	0.060	153767	352.00
1	1	2-1/4	5	0.090	153778	352.00
1	1	2-1/4	5	0.125	153789	352.00
-	-	-	-	-	-	-

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.02, -0.02
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.02, -0.02

CARBIDE ENDMILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS  
 CARBIDE DRILL MILLS  
 CARBIDE THREADMILLS  
 CARBIDE MICRO ENDMILLS

# Solid Carbide Endmills



## Ⓜ CORNER RADIUS - LONG LENGTH - 4 FLUTE - 30° HELIX



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153800	28.03
1/8	1/8	3/4	2-1/4	0.020	153811	28.03
1/8	1/8	3/4	2-1/4	0.030	153822	28.03
3/16	3/16	3/4	2-1/2	0.015	153833	32.58
3/16	3/16	3/4	2-1/2	0.020	153844	32.58
3/16	3/16	3/4	2-1/2	0.030	153855	32.58
1/4	1/4	1-1/8	3	0.015	153866	45.45
1/4	1/4	1-1/8	3	0.020	153877	45.45
1/4	1/4	1-1/8	3	0.030	153888	45.45
1/4	1/4	1-1/8	3	0.045	153899	45.45
1/4	1/4	1-1/8	3	0.060	153910	45.45
1/4	1/4	1	4	0.015	153921	47.73
1/4	1/4	1	4	0.020	153932	47.73
1/4	1/4	1	4	0.030	153943	47.73
1/4	1/4	1	4	0.045	153954	47.73
1/4	1/4	1	4	0.060	153965	47.73
5/16	5/16	1-1/8	3	0.015	153976	51.52
5/16	5/16	1-1/8	3	0.020	153987	51.52
5/16	5/16	1-1/8	3	0.030	153998	51.52
5/16	5/16	1-1/8	3	0.045	154009	51.52
5/16	5/16	1-1/8	3	0.060	154020	51.52
3/8	3/8	1-1/8	3	0.015	154031	65.00
3/8	3/8	1-1/8	3	0.020	154042	65.00
3/8	3/8	1-1/8	3	0.030	154053	65.00
3/8	3/8	1-1/8	3	0.045	154064	65.00
3/8	3/8	1-1/8	3	0.060	154075	65.00
3/8	3/8	1	4	0.015	154086	81.00
3/8	3/8	1	4	0.020	154097	81.00
3/8	3/8	1	4	0.030	154108	81.00
3/8	3/8	1	4	0.045	154119	81.00
3/8	3/8	1	4	0.060	154130	81.00
1/2	1/2	1	4	0.015	154141	112.00
1/2	1/2	1	4	0.020	154152	112.00

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	154163	112.00
1/2	1/2	1	4	0.045	154174	112.00
1/2	1/2	1	4	0.060	154185	112.00
1/2	1/2	1	4	0.090	154196	112.00
1/2	1/2	1	4	0.125	154207	112.00
1/2	1/2	2	4	0.015	154218	119.00
1/2	1/2	2	4	0.020	154229	119.00
1/2	1/2	2	4	0.030	154240	119.00
1/2	1/2	2	4	0.045	154251	119.00
1/2	1/2	2	4	0.060	154262	119.00
1/2	1/2	2	4	0.090	154273	119.00
1/2	1/2	2	4	0.125	154284	119.00
5/8	5/8	2-1/4	5	0.015	154295	215.15
5/8	5/8	2-1/4	5	0.020	154306	215.15
5/8	5/8	2-1/4	5	0.030	154317	215.15
5/8	5/8	2-1/4	5	0.045	154328	215.15
5/8	5/8	2-1/4	5	0.060	154339	215.15
5/8	5/8	2-1/4	5	0.090	154350	215.15
3/4	3/4	2-1/4	5	0.015	154361	280.00
3/4	3/4	2-1/4	5	0.020	154372	280.00
3/4	3/4	2-1/4	5	0.030	154383	280.00
3/4	3/4	2-1/4	5	0.045	154394	280.00
3/4	3/4	2-1/4	5	0.060	154405	280.00
3/4	3/4	2-1/4	5	0.090	154416	280.00
3/4	3/4	2-1/4	5	0.125	154427	280.00
1	1	2-1/4	5	0.015	154438	440.00
1	1	2-1/4	5	0.020	154449	440.00
1	1	2-1/4	5	0.030	154460	440.00
1	1	2-1/4	5	0.045	154471	440.00
1	1	2-1/4	5	0.060	154482	440.00
1	1	2-1/4	5	0.090	154493	440.00
1	1	2-1/4	5	0.125	154504	440.00
-	-	-	-	-	-	-

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



# Solid Carbide Endmills

## **R** CORNER RADIUS - EXTRA LONG LENGTH - 4 FLUTE - 30° HELIX



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	154515	25.45
1/8	1/8	1	3	0.020	154526	25.45
1/8	1/8	1	3	0.030	154537	25.45
3/16	3/16	1-1/8	3	0.015	154548	27.88
3/16	3/16	1-1/8	3	0.020	154559	27.88
3/16	3/16	1-1/8	3	0.030	154570	27.88
1/4	1/4	1-1/2	4	0.015	154581	38.79
1/4	1/4	1-1/2	4	0.020	154592	38.79
1/4	1/4	1-1/2	4	0.030	154603	38.79
1/4	1/4	1-1/2	4	0.045	154614	38.79
1/4	1/4	1-1/2	4	0.060	154625	38.79
1/4	1/4	1-1/2	6	0.015	154636	52.12
1/4	1/4	1-1/2	6	0.020	154647	52.12
1/4	1/4	1-1/2	6	0.030	154658	52.12
1/4	1/4	1-1/2	6	0.045	154669	52.12
1/4	1/4	1-1/2	6	0.060	154680	52.12
5/16	5/16	1-5/8	4	0.015	154691	53.33
5/16	5/16	1-5/8	4	0.020	154702	53.33
5/16	5/16	1-5/8	4	0.030	154713	53.33
5/16	5/16	1-5/8	4	0.045	154724	53.33
5/16	5/16	1-5/8	4	0.060	154735	53.33
3/8	3/8	1-3/4	4	0.015	154746	58.18
3/8	3/8	1-3/4	4	0.020	154757	58.18
3/8	3/8	1-3/4	4	0.030	154768	58.18
3/8	3/8	1-3/4	4	0.045	154779	58.18
3/8	3/8	1-3/4	4	0.060	154790	58.18
3/8	3/8	1-1/2	6	0.015	154801	82.42
3/8	3/8	1-1/2	6	0.020	154812	82.42
3/8	3/8	1-1/2	6	0.030	154823	82.42
3/8	3/8	1-1/2	6	0.045	154834	82.42
3/8	3/8	1-1/2	6	0.060	154845	82.42
1/2	1/2	1-1/2	6	0.015	154856	124.85
1/2	1/2	1-1/2	6	0.020	154867	124.85
1/2	1/2	1-1/2	6	0.030	154878	124.85
1/2	1/2	1-1/2	6	0.045	154889	124.85
1/2	1/2	1-1/2	6	0.060	154900	124.85
1/2	1/2	1-1/2	6	0.090	154911	124.85
1/2	1/2	1-1/2	6	0.125	154922	124.85
1/2	1/2	3	6	0.015	154933	130.91
1/2	1/2	3	6	0.020	154944	130.91

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	154955	130.91
1/2	1/2	3	6	0.045	154966	130.91
1/2	1/2	3	6	0.060	154977	130.91
1/2	1/2	3	6	0.090	154988	130.91
1/2	1/2	3	6	0.125	154999	130.91
5/8	5/8	3	6	0.015	155010	184.24
5/8	5/8	3	6	0.020	155021	184.24
5/8	5/8	3	6	0.030	155032	184.24
5/8	5/8	3	6	0.045	155043	184.24
5/8	5/8	3	6	0.060	155054	184.24
5/8	5/8	3	6	0.090	155065	184.24
3/4	3/4	3	6	0.015	155076	257.00
3/4	3/4	3	6	0.020	155087	257.00
3/4	3/4	3	6	0.030	155098	257.00
3/4	3/4	3	6	0.045	155109	257.00
3/4	3/4	3	6	0.060	155120	257.00
3/4	3/4	3	6	0.090	155131	257.00
3/4	3/4	3	6	0.125	155142	257.00
3/4	3/4	4	7	0.015	155153	415.20
3/4	3/4	4	7	0.020	155164	415.20
3/4	3/4	4	7	0.030	155175	415.20
3/4	3/4	4	7	0.045	155186	415.20
3/4	3/4	4	7	0.060	155197	415.20
3/4	3/4	4	7	0.090	155208	415.20
3/4	3/4	4	7	0.125	155219	415.20
1	1	3	6	0.015	155230	433.94
1	1	3	6	0.020	155241	433.94
1	1	3	6	0.030	155252	433.94
1	1	3	6	0.045	155263	433.94
1	1	3	6	0.060	155274	433.94
1	1	3	6	0.090	155285	433.94
1	1	3	6	0.125	155296	433.94
1	1	4	7	0.015	155307	593.94
1	1	4	7	0.020	155318	593.94
1	1	4	7	0.030	155329	593.94
1	1	4	7	0.045	155340	593.94
1	1	4	7	0.060	155351	593.94
1	1	4	7	0.090	155362	593.94
1	1	4	7	0.125	155373	593.94
-	-	-	-	-	-	-

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004	+0.002, -0.002
5/8" - 1"	+0.000, -0.003	-0.0001, -0.0004	+0.002, -0.002

CARBIDE ENDMILLS  
 CARBIDE REAMERS  
 CARBIDE DRILLS  
 CARBIDE DRILL MILLS  
 CARBIDE THREADMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



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



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	155384	31.82
1/8	1/8	1	3	0.020	155395	31.82
1/8	1/8	1	3	0.030	155406	31.82
3/16	3/16	1-1/8	3	0.015	155417	34.85
3/16	3/16	1-1/8	3	0.020	155428	34.85
3/16	3/16	1-1/8	3	0.030	155439	34.85
1/4	1/4	1-1/2	4	0.015	155450	48.48
1/4	1/4	1-1/2	4	0.020	155461	48.48
1/4	1/4	1-1/2	4	0.030	155472	48.48
1/4	1/4	1-1/2	4	0.045	155483	48.48
1/4	1/4	1-1/2	4	0.060	155494	48.48
1/4	1/4	1-1/2	6	0.015	155505	65.15
1/4	1/4	1-1/2	6	0.020	155516	65.15
1/4	1/4	1-1/2	6	0.030	155527	65.15
1/4	1/4	1-1/2	6	0.045	155538	65.15
1/4	1/4	1-1/2	6	0.060	155549	65.15
5/16	5/16	1-5/8	4	0.015	155560	66.67
5/16	5/16	1-5/8	4	0.020	155571	66.67
5/16	5/16	1-5/8	4	0.030	155582	66.67
5/16	5/16	1-5/8	4	0.045	155593	66.67
5/16	5/16	1-5/8	4	0.060	155604	66.67
3/8	3/8	1-3/4	4	0.015	155615	72.73
3/8	3/8	1-3/4	4	0.020	155626	72.73
3/8	3/8	1-3/4	4	0.030	155637	72.73
3/8	3/8	1-3/4	4	0.045	155648	72.73
3/8	3/8	1-3/4	4	0.060	155659	72.73
3/8	3/8	1-1/2	6	0.015	155670	103.03
3/8	3/8	1-1/2	6	0.020	155681	103.03
3/8	3/8	1-1/2	6	0.030	155692	103.03
3/8	3/8	1-1/2	6	0.045	155703	103.03
3/8	3/8	1-1/2	6	0.060	155714	103.03
1/2	1/2	1-1/2	6	0.015	155725	156.06
1/2	1/2	1-1/2	6	0.020	155736	156.06
1/2	1/2	1-1/2	6	0.030	155747	156.06
1/2	1/2	1-1/2	6	0.045	155758	156.06
1/2	1/2	1-1/2	6	0.060	155769	156.06
1/2	1/2	1-1/2	6	0.090	155780	156.06
1/2	1/2	1-1/2	6	0.125	155791	156.06
1/2	1/2	3	6	0.015	155802	163.64
1/2	1/2	3	6	0.020	155813	163.64

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	155824	163.64
1/2	1/2	3	6	0.045	155835	163.64
1/2	1/2	3	6	0.060	155846	163.64
1/2	1/2	3	6	0.090	155857	163.64
1/2	1/2	3	6	0.125	155868	163.64
5/8	5/8	3	6	0.015	155879	230.30
5/8	5/8	3	6	0.020	155890	230.30
5/8	5/8	3	6	0.030	155901	230.30
5/8	5/8	3	6	0.045	155912	230.30
5/8	5/8	3	6	0.060	155923	230.30
5/8	5/8	3	6	0.090	155934	230.30
3/4	3/4	3	6	0.015	155945	316.00
3/4	3/4	3	6	0.020	155956	316.00
3/4	3/4	3	6	0.030	155967	316.00
3/4	3/4	3	6	0.045	155978	316.00
3/4	3/4	3	6	0.060	155989	316.00
3/4	3/4	3	6	0.090	156000	316.00
3/4	3/4	3	6	0.125	156011	316.00
3/4	3/4	4	7	0.015	156022	519.00
3/4	3/4	4	7	0.020	156033	519.00
3/4	3/4	4	7	0.030	156044	519.00
3/4	3/4	4	7	0.045	156055	519.00
3/4	3/4	4	7	0.060	156066	519.00
3/4	3/4	4	7	0.090	156077	519.00
3/4	3/4	4	7	0.125	156088	519.00
1	1	3	6	0.015	156099	515.00
1	1	3	6	0.020	156110	515.00
1	1	3	6	0.030	156121	515.00
1	1	3	6	0.045	156132	515.00
1	1	3	6	0.060	156143	515.00
1	1	3	6	0.090	156154	515.00
1	1	3	6	0.125	156165	515.00
1	1	4	7	0.015	156176	742.42
1	1	4	7	0.020	156187	742.42
1	1	4	7	0.030	156198	742.42
1	1	4	7	0.045	156209	742.42
1	1	4	7	0.060	156220	742.42
1	1	4	7	0.090	156231	742.42
1	1	4	7	0.125	156242	742.42
-	-	-	-	-	-	-

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004	+0.002, -0.002
5/8" - 1"	+0.000, -0.003	-0.0001, -0.0004	+0.002, -0.002



# Solid Carbide Endmills

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



**UNCOATED  
METRIC**



**ALTiN COATED  
METRIC**

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1.0	3	3	38	216753	18.10
1.5	3	4.2	38	133758	18.10
2.0	3	6	38	133769	18.10
2.5	3	8	38	133780	18.10
3.0	3	12	38	133791	18.10
3.5	4	12	50	133802	22.30
4.0	4	14	50	133813	22.30
4.5	6	16	50	133824	27.27
5.0	6	16	50	133835	27.27
6.0	6	19	50	133846	28.50
7.0	8	19	63	133857	31.00
8.0	8	20	63	133868	32.23
9.0	10	22	75	133879	47.10
10.0	10	22	75	133890	59.50
11.0	12	25	75	133901	65.70
12.0	12	25	75	133912	68.17
14.0	14	32	89	133923	115.30
16.0	16	32	89	133934	131.40
18.0	18	38	100	133945	179.77
20.0	20	38	100	133956	285.13
25.0	25	38	100	133967	371.90

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1.0	3	3	38	216764	22.60
1.5	3	4.2	38	133978	22.60
2.0	3	6	38	133989	22.60
2.5	3	8	38	134000	22.60
3.0	3	12	38	134011	22.60
3.5	4	12	50	134022	27.90
4.0	4	14	50	134033	27.90
4.5	6	16	50	134044	34.10
5.0	6	16	50	134055	34.10
6.0	6	19	50	134066	35.63
7.0	8	19	63	134077	38.73
8.0	8	20	63	134088	40.30
9.0	10	22	75	134099	58.87
10.0	10	22	75	134110	74.37
11.0	12	25	75	134121	82.13
12.0	12	25	75	134132	85.23
14.0	14	32	89	134143	144.13
16.0	16	32	89	134154	164.27
18.0	18	38	100	134165	224.70
20.0	20	38	100	134176	356.40
25.0	25	38	100	134187	464.90

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.00mm, -0.05mm	-0.0025, -0.01mm

CARBIDE ENDMILLS  
 CARBIDE REAMERS  
 CARBIDE DRILLS  
 CARBIDE DRILL MILLS  
 CARBIDE THREADMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



## STUB LENGTH - 2 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/64	1/8	0.023	1-1/2	216577	20.83	216687	26.03	216599	26.00	216709	32.50
1/32	1/8	1/16	1-1/2	130381	12.83	132449	16.63	130546	16.70	132614	21.37
3/64	1/8	3/32	1-1/2	130392	12.83	132460	16.63	130557	16.70	132625	21.37
1/16	1/8	1/8	1-1/2	130403	9.60	132471	12.53	130568	12.57	132636	16.07
5/64	1/8	1/8	1-1/2	216588	16.23	216698	20.30	216610	20.33	216720	25.40
3/32	1/8	3/16	1-1/2	130414	9.60	132482	12.53	130579	12.57	132647	16.07
1/8	1/8	1/4	1-1/2	130425	9.17	132493	11.97	130590	11.90	132658	15.27
5/32	3/16	5/16	2	130436	15.27	132504	18.87	130601	19.83	132669	25.40
3/16	3/16	3/8	2	130447	14.33	132515	17.77	130612	18.60	132680	23.80
7/32	1/4	7/16	2	130458	19.27	132526	23.90	130623	25.00	132691	32.00
1/4	1/4	1/2	2	130469	16.90	132537	21.00	130634	21.90	132702	28.03
5/16	5/16	1/2	2	130480	22.83	132548	29.70	130645	29.63	132713	37.93
3/8	3/8	5/8	2	130491	29.47	132559	36.50	130656	38.27	132724	46.67
7/16	7/16	5/8	2-1/2	130502	36.77	132570	45.63	130667	47.87	132735	58.37
1/2	1/2	5/8	2-1/2	130513	46.43	132581	57.67	130678	60.30	132746	77.17
5/8	5/8	3/4	3	130524	98.30	132592	116.13	130689	115.17	132757	141.00
3/4	3/4	1	3	130535	137.60	132603	170.27	130700	175.10	132768	224.13

## STUB LENGTH - 4 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/64	1/8	0.023	1-1/2	216621	20.83	216665	26.03	216643	26.00	216731	32.50
1/32	1/8	1/16	1-1/2	131140	12.83	131170	16.63	131305	16.70	133593	21.37
3/64	1/8	3/32	1-1/2	131151	12.83	131481	16.63	131316	16.70	133604	21.37
1/16	1/8	1/8	1-1/2	131162	9.60	131492	12.53	131327	12.57	133615	16.07
5/64	1/8	1/8	1-1/2	216632	16.23	216676	20.30	216654	20.33	216742	25.40
3/32	1/8	3/16	1-1/2	131173	9.60	131503	12.53	131338	12.57	133626	16.07
1/8	1/8	1/4	1-1/2	131184	9.17	131514	11.97	131349	11.90	133637	15.27
5/32	3/16	5/16	2	131195	15.27	131525	18.87	131360	19.83	133648	25.40
3/16	3/16	3/8	2	131206	14.33	131536	17.77	131371	18.60	133659	23.80
7/32	1/4	7/16	2	131217	19.27	131547	23.90	131382	25.00	133670	32.00
1/4	1/4	1/2	2	131228	16.90	131558	21.00	131393	21.90	133681	28.03
5/16	5/16	1/2	2	131239	22.83	131569	29.70	131404	29.63	133692	37.93
3/8	3/8	5/8	2	131250	29.47	131580	36.50	131415	38.27	133703	46.67
7/16	7/16	5/8	2-1/2	131261	36.77	131591	45.63	131426	47.87	133714	58.37
1/2	1/2	5/8	2-1/2	131272	46.43	131602	57.83	131437	60.30	133725	77.17
5/8	5/8	3/4	3	131283	98.30	131613	116.17	131448	115.17	133736	141.00
3/4	3/4	1	3	131294	137.60	131624	170.27	131459	175.10	133747	224.13

TOLERANCES	DIAMETER	SHANK
1/64" - 1/2"	+0.00, -0.002	-0.001, -0.004
5/8" - 3/4"	+0.00, -0.003	-0.001, -0.004



# Solid Carbide Endmills

## DOUBLE END - STUB LENGTH - 2 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/16	1/8	1/8	1-1/2	135166	17.15	135892	23.16	135287	21.46	135408	28.97
3/32	1/8	3/16	1-1/2	135177	17.67	135903	23.87	135298	22.07	135419	29.81
1/8	1/8	1/4	1-1/2	135188	14.26	135914	19.24	135309	17.83	135430	24.06
5/32	3/16	5/16	2	135199	19.18	135925	25.89	135320	23.96	135441	32.35
3/16	3/16	3/8	2	135210	19.18	135936	25.89	135331	23.96	135452	32.35
7/32	1/4	1/2	2-1/2	135221	26.31	135947	35.53	135342	32.89	135463	44.39
1/4	1/4	1/2	2-1/2	135232	26.31	135958	35.53	135353	32.89	135474	44.39
5/16	5/16	1/2	2-1/2	135243	35.56	135969	43.65	135364	44.46	135485	54.54
3/8	3/8	9/16	2-1/2	135254	39.25	135980	48.15	135375	49.05	135496	60.20
7/16	7/16	9/16	2-3/4	135265	55.44	135991	68.06	135386	69.32	135507	85.09
1/2	1/2	5/8	3	135276	67.87	136002	91.61	135397	84.83	135518	114.54

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



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/16	1/8	1/8	1-1/2	135529	17.15	136013	23.16	135650	21.46	135771	28.97
3/32	1/8	3/16	1-1/2	135540	17.67	136024	23.87	135661	22.07	135782	29.81
1/8	1/8	1/4	1-1/2	135551	14.26	136035	19.24	135672	17.83	135793	24.06
5/32	3/16	5/16	2	135562	19.18	136046	25.89	135683	23.96	135804	32.35
3/16	3/16	3/8	2	135573	19.18	136057	25.89	135694	23.96	135815	32.35
7/32	1/4	1/2	2-1/2	135584	26.31	136068	35.53	135705	32.89	135826	44.39
1/4	1/4	1/2	2-1/2	135595	26.31	136079	35.53	135716	32.89	135837	44.39
5/16	5/16	1/2	2-1/2	135606	35.56	136090	43.65	135727	44.46	135848	54.54
3/8	3/8	9/16	2-1/2	135617	39.25	136101	48.15	135738	49.05	135859	60.20
7/16	7/16	9/16	2-3/4	135628	55.44	136112	68.06	135749	69.32	135870	85.09
1/2	1/2	5/8	3	135639	67.87	136123	91.61	135760	84.83	135881	114.54

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.000, -0.002	-0.0001, -0.0004

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

# Solid Carbide Endmills



## DOUBLE END - REGULAR LENGTH - 2 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/8	3/8	3/8	3-1/8	134198	61.40	134319	82.87	134682	69.07	134803	93.20
5/32	3/8	7/16	3-1/4	134209	59.43	134330	80.23	134693	69.07	134814	93.20
3/16	3/8	1/2	3-1/4	134220	59.43	134341	80.23	134704	69.07	134825	93.20
7/32	3/8	9/16	3-1/2	134231	62.80	134352	84.80	134715	69.07	134836	93.20
1/4	3/8	5/8	3-1/2	134242	61.13	134363	82.53	134726	69.07	134847	93.20
9/32	3/8	11/16	3-1/2	134253	67.40	134374	91.00	134737	79.27	134858	107.03
5/16	3/8	3/4	3-1/2	134264	67.40	134385	91.00	134748	79.27	134869	107.03
11/32	3/8	3/4	3-1/2	134275	67.40	134396	91.00	134759	79.27	134880	107.03
3/8	3/8	3/4	3-1/2	134286	67.40	134407	91.00	134770	79.27	134891	107.03
7/16	1/2	7/8	4	134297	100.27	134418	135.40	134781	107.90	134902	145.67
1/2	1/2	1	4	134308	112.63	134429	152.07	134792	117.30	134913	158.33

NOTE: ALL TOOLS WITH WELDON FLATS

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



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/8	3/8	3/8	3-1/8	134440	58.03	134561	78.37	134924	69.07	135045	93.20
5/32	3/8	7/16	3-1/4	134451	56.20	134572	75.87	134935	69.07	135056	93.20
3/16	3/8	1/2	3-1/4	134462	56.20	134583	75.87	134946	69.07	135067	93.20
7/32	3/8	9/16	3-1/2	134473	59.37	134594	80.17	134957	69.07	135078	93.20
1/4	3/8	5/8	3-1/2	134484	57.80	134605	78.03	134968	69.07	135089	93.20
9/32	3/8	11/16	3-1/2	134495	63.73	134616	86.03	134979	79.27	135100	107.03
5/16	3/8	3/4	3-1/2	134506	63.73	134627	86.03	134990	79.27	135111	107.03
11/32	3/8	3/4	3-1/2	134517	63.73	134638	86.03	135001	79.27	135122	107.03
3/8	3/8	3/4	3-1/2	134528	63.73	134649	86.03	135012	79.27	135133	107.03
7/16	1/2	7/8	4	134539	94.80	134660	128.00	135023	107.90	135144	145.67
1/2	1/2	1	4	134550	106.50	134671	143.80	135034	117.30	135155	158.33

NOTE: ALL TOOLS WITH WELDON FLATS

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



# Solid Carbide Micro Endmills

## 2 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.005	0.125	0.015	1-1/2	143768	45.48	222682	54.58	144956	56.85	223870	68.21
0.006	0.125	0.018	1-1/2	143779	45.48	222693	54.58	144967	56.85	223881	68.21
0.007	0.125	0.021	1-1/2	143790	45.48	222704	54.58	144978	56.85	223892	68.21
0.008	0.125	0.024	1-1/2	143801	45.48	222715	54.58	144989	56.85	223903	68.21
0.009	0.125	0.027	1-1/2	143812	40.76	222726	48.91	145000	50.97	223914	61.15
0.010	0.125	0.030	1-1/2	143823	40.76	222737	48.91	145011	50.97	223925	61.15
0.011	0.125	0.033	1-1/2	143834	36.48	222748	43.79	145022	45.61	223936	54.76
0.012	0.125	0.036	1-1/2	143845	36.48	222759	43.79	145033	45.61	223947	54.76
0.013	0.125	0.039	1-1/2	143856	30.18	222770	36.21	145044	37.79	223958	45.33
0.014	0.125	0.042	1-1/2	143867	30.18	222781	36.21	145055	37.79	223969	45.33
0.015	0.125	0.045	1-1/2	143878	25.52	222792	30.61	145066	31.88	223980	38.24
0.016	0.125	0.048	1-1/2	143889	25.52	222803	30.61	145077	31.88	223991	38.24
0.017	0.125	0.051	1-1/2	143900	25.52	222814	30.61	145088	31.88	224002	38.24
0.018	0.125	0.054	1-1/2	143911	25.52	222825	30.61	145099	31.88	224013	38.24
0.019	0.125	0.057	1-1/2	143922	25.52	222836	30.61	145110	31.88	224024	38.24
0.020	0.125	0.060	1-1/2	143933	23.18	222847	27.82	145121	29.00	224035	34.79
0.021	0.125	0.063	1-1/2	143944	23.18	222858	27.82	145132	29.00	224046	34.79
0.022	0.125	0.066	1-1/2	143955	23.18	222869	27.82	145143	29.00	224057	34.79
0.023	0.125	0.069	1-1/2	143966	23.18	222880	27.82	145154	29.00	224068	34.79
0.024	0.125	0.072	1-1/2	143977	23.18	222891	27.82	145165	29.00	224079	34.79
0.025	0.125	0.075	1-1/2	143988	23.18	222902	27.82	145176	29.00	224090	34.79
0.026	0.125	0.078	1-1/2	143999	21.76	222913	26.12	145187	27.21	224101	32.64
0.027	0.125	0.081	1-1/2	144010	21.76	222924	26.12	145198	27.21	224112	32.64
0.028	0.125	0.084	1-1/2	144021	21.76	222935	26.12	145209	27.21	224123	32.64
0.029	0.125	0.087	1-1/2	144032	21.76	222946	26.12	145220	27.21	224134	32.64
0.030	0.125	0.090	1-1/2	144043	21.76	222957	26.12	145231	27.21	224145	32.64
0.031	0.125	0.093	1-1/2	144054	20.39	222968	24.45	145242	25.52	224156	30.61
0.032	0.125	0.096	1-1/2	144065	20.39	222979	24.45	145253	25.52	224167	30.61
0.033	0.125	0.099	1-1/2	144076	20.39	222990	24.45	145264	25.52	224178	30.61
0.034	0.125	0.102	1-1/2	144087	20.39	223001	24.45	145275	25.52	224189	30.61
0.035	0.125	0.105	1-1/2	144098	20.39	223012	24.45	145286	25.52	224200	30.61
0.036	0.125	0.108	1-1/2	144109	20.39	223023	24.45	145297	25.52	224211	30.61
0.037	0.125	0.111	1-1/2	144120	20.39	223034	24.45	145308	25.52	224222	30.61
0.038	0.125	0.114	1-1/2	144131	20.39	223045	24.45	145319	25.52	224233	30.61
0.039	0.125	0.117	1-1/2	144142	20.39	223056	24.45	145330	25.52	224244	30.61
0.040	0.125	0.120	1-1/2	144153	20.39	223067	24.45	145341	25.52	224255	30.61
0.041	0.125	0.123	1-1/2	144164	20.39	223078	24.45	145352	25.52	224266	30.61
0.042	0.125	0.126	1-1/2	144175	20.39	223089	24.45	145363	25.52	224277	30.61
0.043	0.125	0.129	1-1/2	144186	20.39	223100	24.45	145374	25.52	224288	30.61
0.044	0.125	0.132	1-1/2	144197	19.88	223111	23.88	145385	24.88	224299	29.88
0.045	0.125	0.135	1-1/2	144208	19.88	223122	23.88	145396	24.88	224310	29.88
0.046	0.125	0.138	1-1/2	144219	19.88	223133	23.88	145407	24.88	224321	29.88
0.047	0.125	0.141	1-1/2	144230	19.88	223144	23.88	145418	24.88	224332	29.88
0.048	0.125	0.144	1-1/2	144241	19.88	223155	23.88	145429	24.88	224343	29.88
0.049	0.125	0.147	1-1/2	144252	19.88	223166	23.88	145440	24.88	224354	29.88
0.050	0.125	0.150	1-1/2	144263	19.88	223177	23.88	145451	24.88	224365	29.88
0.051	0.125	0.153	1-1/2	144274	19.88	223188	23.88	145462	24.88	224376	29.88
0.052	0.125	0.156	1-1/2	144285	19.88	223199	23.88	145473	24.88	224387	29.88
0.053	0.125	0.159	1-1/2	144296	19.88	223210	23.88	145484	24.88	224398	29.88
0.054	0.125	0.162	1-1/2	144307	19.88	223221	23.88	145495	24.88	224409	29.88
0.055	0.125	0.165	1-1/2	144318	19.88	223232	23.88	145506	24.88	224420	29.88
0.056	0.125	0.168	1-1/2	144329	19.88	223243	23.88	145517	24.88	224431	29.88
0.057	0.125	0.171	1-1/2	144340	19.88	223254	23.88	145528	24.88	224442	29.88
0.058	0.125	0.174	1-1/2	144351	19.88	223265	23.88	145539	24.88	224453	29.88

LENGTH OF CUT = 3 X DIAMETER

CONTINUED ON NEXT PAGE

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

CARBIDE ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

# Solid Carbide Micro Endmills



## 2 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.059	0.125	0.177	1-1/2	144362	19.88	223276	23.88	145550	24.88	224464	29.88
0.060	0.125	0.180	1-1/2	144373	19.88	223287	23.88	145561	24.88	224475	29.88
0.061	0.125	0.183	1-1/2	144384	19.88	223298	23.88	145572	24.88	224486	29.88
0.062	0.125	0.186	1-1/2	144395	19.88	223309	23.88	145583	24.88	224497	29.88
0.063	0.125	0.189	1-1/2	144406	19.88	223320	23.88	145594	24.88	224508	29.88
0.064	0.125	0.192	1-1/2	144417	19.88	223331	23.88	145605	24.88	224519	29.88
0.065	0.125	0.195	1-1/2	144428	19.88	223342	23.88	145616	24.88	224530	29.88
0.066	0.125	0.198	1-1/2	144439	19.88	223353	23.88	145627	24.88	224541	29.88
0.067	0.125	0.201	1-1/2	144450	19.88	223364	23.88	145638	24.88	224552	29.88
0.068	0.125	0.204	1-1/2	144461	19.88	223375	23.88	145649	24.88	224563	29.88
0.069	0.125	0.207	1-1/2	144472	19.88	223386	23.88	145660	24.88	224574	29.88
0.070	0.125	0.210	1-1/2	144483	19.88	223397	23.88	145671	24.88	224585	29.88
0.071	0.125	0.213	1-1/2	144494	19.88	223408	23.88	145682	24.88	224596	29.88
0.072	0.125	0.216	1-1/2	144505	19.88	223419	23.88	145693	24.88	224607	29.88
0.073	0.125	0.219	1-1/2	144516	19.88	223430	23.88	145704	24.88	224618	29.88
0.074	0.125	0.222	1-1/2	144527	19.88	223441	23.88	145715	24.88	224629	29.88
0.075	0.125	0.225	1-1/2	144538	19.88	223452	23.88	145726	24.88	224640	29.88
0.076	0.125	0.228	1-1/2	144549	19.88	223463	23.88	145737	24.88	224651	29.88
0.077	0.125	0.231	1-1/2	144560	19.88	223474	23.88	145748	24.88	224662	29.88
0.078	0.125	0.234	1-1/2	144571	19.88	223485	23.88	145759	24.88	224673	29.88
0.079	0.125	0.237	1-1/2	144582	19.88	223496	23.88	145770	24.88	224684	29.88
0.080	0.125	0.240	1-1/2	144593	19.88	223507	23.88	145781	24.88	224695	29.88
0.081	0.125	0.243	1-1/2	144604	19.88	223518	23.88	145792	24.88	224706	29.88
0.082	0.125	0.246	1-1/2	144615	19.88	223529	23.88	145803	24.88	224717	29.88
0.083	0.125	0.249	1-1/2	144626	19.88	223540	23.88	145814	24.88	224728	29.88
0.084	0.125	0.252	1-1/2	144637	19.88	223551	23.88	145825	24.88	224739	29.88
0.085	0.125	0.255	1-1/2	144648	19.88	223562	23.88	145836	24.88	224750	29.88
0.086	0.125	0.258	1-1/2	144659	19.88	223573	23.88	145847	24.88	224761	29.88
0.087	0.125	0.261	1-1/2	144670	19.88	223584	23.88	145858	24.88	224772	29.88
0.088	0.125	0.264	1-1/2	144681	19.88	223595	23.88	145869	24.88	224783	29.88
0.089	0.125	0.267	1-1/2	144692	19.88	223606	23.88	145880	24.88	224794	29.88
0.090	0.125	0.270	1-1/2	144703	19.88	223617	23.88	145891	24.88	224805	29.88
0.091	0.125	0.273	1-1/2	144714	19.88	223628	23.88	145902	24.88	224816	29.88
0.092	0.125	0.276	1-1/2	144725	19.88	223639	23.88	145913	24.88	224827	29.88
0.093	0.125	0.279	1-1/2	144736	19.88	223650	23.88	145924	24.88	224838	29.88
0.094	0.125	0.282	1-1/2	144747	19.88	223661	23.88	145935	24.88	224849	29.88
0.095	0.125	0.285	1-1/2	144758	19.88	223672	23.88	145946	24.88	224860	29.88
0.096	0.125	0.288	1-1/2	144769	19.88	223683	23.88	145957	24.88	224871	29.88
0.097	0.125	0.291	1-1/2	144780	19.88	223694	23.88	145968	24.88	224882	29.88
0.098	0.125	0.294	1-1/2	144791	19.88	223705	23.88	145979	24.88	224893	29.88
0.099	0.125	0.297	1-1/2	144802	19.88	223716	23.88	145990	24.88	224904	29.88
0.100	0.125	0.300	1-1/2	144813	19.88	223727	23.88	146001	24.88	224915	29.88
0.101	0.125	0.303	1-1/2	144824	19.88	223738	23.88	146012	24.88	224926	29.88
0.102	0.125	0.306	1-1/2	144835	19.88	223749	23.88	146023	24.88	224937	29.88
0.103	0.125	0.309	1-1/2	144846	19.88	223760	23.88	146034	24.88	224948	29.88
0.104	0.125	0.312	1-1/2	144857	19.88	223771	23.88	146045	24.88	224959	29.88
0.105	0.125	0.315	1-1/2	144868	19.88	223782	23.88	146056	24.88	224970	29.88
0.106	0.125	0.318	1-1/2	144879	19.88	223793	23.88	146067	24.88	224981	29.88
0.107	0.125	0.321	1-1/2	144890	19.88	223804	23.88	146078	24.88	224992	29.88
0.108	0.125	0.324	1-1/2	144901	19.88	223815	23.88	146089	24.88	225003	29.88
0.109	0.125	0.327	1-1/2	144912	19.88	223826	23.88	146100	24.88	225014	29.88
0.110	0.125	0.330	1-1/2	144923	19.88	223837	23.88	146111	24.88	225025	29.88
0.115	0.125	0.345	1-1/2	144934	19.88	223848	23.88	146122	24.88	225036	29.88
0.120	0.125	0.360	1-1/2	144945	19.88	223859	23.88	146133	24.88	225047	29.88

LENGTH OF CUT = 3 X DIAMETER

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

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Solid Carbide Micro Endmills

## 4 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.010	0.125	0.030	1-1/2	146144	40.76	225058	48.91	147277	50.97	226191	61.15
0.011	0.125	0.033	1-1/2	146155	36.48	225069	43.79	147288	45.61	226202	54.76
0.012	0.125	0.036	1-1/2	146166	36.48	225080	43.79	147299	45.61	226213	54.76
0.013	0.125	0.039	1-1/2	146177	30.18	225091	36.21	147310	37.79	226224	45.33
0.014	0.125	0.042	1-1/2	146188	30.18	225102	36.21	147321	37.79	226235	45.33
0.015	0.125	0.045	1-1/2	146199	25.52	225113	30.61	147332	31.88	226246	38.24
0.016	0.125	0.048	1-1/2	146210	25.52	225124	30.61	147343	31.88	226257	38.24
0.017	0.125	0.051	1-1/2	146221	25.52	225135	30.61	147354	31.88	226268	38.24
0.018	0.125	0.054	1-1/2	146232	25.52	225146	30.61	147365	31.88	226279	38.24
0.019	0.125	0.057	1-1/2	146243	25.52	225157	30.61	147376	31.88	226290	38.24
0.020	0.125	0.060	1-1/2	146254	23.18	225168	27.82	147387	29.00	226301	34.79
0.021	0.125	0.063	1-1/2	146265	23.18	225179	27.82	147398	29.00	226312	34.79
0.022	0.125	0.066	1-1/2	146276	23.18	225190	27.82	147409	29.00	226323	34.79
0.023	0.125	0.069	1-1/2	146287	23.18	225201	27.82	147420	29.00	226334	34.79
0.024	0.125	0.072	1-1/2	146298	23.18	225212	27.82	147431	29.00	226345	34.79
0.025	0.125	0.075	1-1/2	146309	23.18	225223	27.82	147442	29.00	226356	34.79
0.026	0.125	0.078	1-1/2	146320	21.76	225234	26.12	147453	27.21	226367	32.64
0.027	0.125	0.081	1-1/2	146331	21.76	225245	26.12	147464	27.21	226378	32.64
0.028	0.125	0.084	1-1/2	146342	21.76	225256	26.12	147475	27.21	226389	32.64
0.029	0.125	0.087	1-1/2	146353	21.76	225267	26.12	147486	27.21	226400	32.64
0.030	0.125	0.090	1-1/2	146364	21.76	225278	26.12	147497	27.21	226411	32.64
0.031	0.125	0.093	1-1/2	146375	20.39	225289	24.45	147508	25.52	226422	30.61
0.032	0.125	0.096	1-1/2	146386	20.39	225300	24.45	147519	25.52	226433	30.61
0.033	0.125	0.099	1-1/2	146397	20.39	225311	24.45	147530	25.52	226444	30.61
0.034	0.125	0.102	1-1/2	146408	20.39	225322	24.45	147541	25.52	226455	30.61
0.035	0.125	0.105	1-1/2	146419	20.39	225333	24.45	147552	25.52	226466	30.61
0.036	0.125	0.108	1-1/2	146430	20.39	225344	24.45	147563	25.52	226477	30.61
0.037	0.125	0.111	1-1/2	146441	20.39	225355	24.45	147574	25.52	226488	30.61
0.038	0.125	0.114	1-1/2	146452	20.39	225366	24.45	147585	25.52	226499	30.61
0.039	0.125	0.117	1-1/2	146463	20.39	225377	24.45	147596	25.52	226510	30.61
0.040	0.125	0.120	1-1/2	146474	20.39	225388	24.45	147607	25.52	226521	30.61
0.041	0.125	0.123	1-1/2	146485	20.39	225399	24.45	147618	25.52	226532	30.61
0.042	0.125	0.126	1-1/2	146496	20.39	225410	24.45	147629	25.52	226543	30.61
0.043	0.125	0.129	1-1/2	146507	20.39	225421	24.45	147640	25.52	226554	30.61
0.044	0.125	0.132	1-1/2	146518	19.88	225432	23.88	147651	24.88	226565	29.88
0.045	0.125	0.135	1-1/2	146529	19.88	225443	23.88	147662	24.88	226576	29.88
0.046	0.125	0.138	1-1/2	146540	19.88	225454	23.88	147673	24.88	226587	29.88
0.047	0.125	0.141	1-1/2	146551	19.88	225465	23.88	147684	24.88	226598	29.88
0.048	0.125	0.144	1-1/2	146562	19.88	225476	23.88	147695	24.88	226609	29.88
0.049	0.125	0.147	1-1/2	146573	19.88	225487	23.88	147706	24.88	226620	29.88
0.050	0.125	0.150	1-1/2	146584	19.88	225498	23.88	147717	24.88	226631	29.88
0.051	0.125	0.153	1-1/2	146595	19.88	225509	23.88	147728	24.88	226642	29.88
0.052	0.125	0.156	1-1/2	146606	19.88	225520	23.88	147739	24.88	226653	29.88
0.053	0.125	0.159	1-1/2	146617	19.88	225531	23.88	147750	24.88	226664	29.88
0.054	0.125	0.162	1-1/2	146628	19.88	225542	23.88	147761	24.88	226675	29.88
0.055	0.125	0.165	1-1/2	146639	19.88	225553	23.88	147772	24.88	226686	29.88
0.056	0.125	0.168	1-1/2	146650	19.88	225564	23.88	147783	24.88	226697	29.88
0.057	0.125	0.171	1-1/2	146661	19.88	225575	23.88	147794	24.88	226708	29.88
0.058	0.125	0.174	1-1/2	146672	19.88	225586	23.88	147805	24.88	226719	29.88

CONTINUED ON NEXT PAGE

LENGTH OF CUT = 3 X DIAMETER

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.005, -0.005	-0.001, -0.003

CARBIDE ENDMILLS  
CARBIDE THREADED MILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

# Solid Carbide Micro Endmills



## 4 FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIN COATED



BALL NOSE - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.059	0.125	0.177	1-1/2	146683	19.88	225597	23.88	147816	24.88	226730	29.88
0.060	0.125	0.180	1-1/2	146694	19.88	225608	23.88	147827	24.88	226741	29.88
0.061	0.125	0.183	1-1/2	146705	19.88	225619	23.88	147838	24.88	226752	29.88
0.062	0.125	0.186	1-1/2	146716	19.88	225630	23.88	147849	24.88	226763	29.88
0.063	0.125	0.189	1-1/2	146727	19.88	225641	23.88	147860	24.88	226774	29.88
0.064	0.125	0.192	1-1/2	146738	19.88	225652	23.88	147871	24.88	226785	29.88
0.065	0.125	0.195	1-1/2	146749	19.88	225663	23.88	147882	24.88	226796	29.88
0.066	0.125	0.198	1-1/2	146760	19.88	225674	23.88	147893	24.88	226807	29.88
0.067	0.125	0.201	1-1/2	146771	19.88	225685	23.88	147904	24.88	226818	29.88
0.068	0.125	0.204	1-1/2	146782	19.88	225696	23.88	147915	24.88	226829	29.88
0.069	0.125	0.207	1-1/2	146793	19.88	225707	23.88	147926	24.88	226840	29.88
0.070	0.125	0.210	1-1/2	146804	19.88	225718	23.88	147937	24.88	226851	29.88
0.071	0.125	0.213	1-1/2	146815	19.88	225729	23.88	147948	24.88	226862	29.88
0.072	0.125	0.216	1-1/2	146826	19.88	225740	23.88	147959	24.88	226873	29.88
0.073	0.125	0.219	1-1/2	146837	19.88	225751	23.88	147970	24.88	226884	29.88
0.074	0.125	0.222	1-1/2	146848	19.88	225762	23.88	147981	24.88	226895	29.88
0.075	0.125	0.225	1-1/2	146859	19.88	225773	23.88	147992	24.88	226906	29.88
0.076	0.125	0.228	1-1/2	146870	19.88	225784	23.88	148003	24.88	226917	29.88
0.077	0.125	0.231	1-1/2	146881	19.88	225795	23.88	148014	24.88	226928	29.88
0.078	0.125	0.234	1-1/2	146892	19.88	225806	23.88	148025	24.88	226939	29.88
0.079	0.125	0.237	1-1/2	146903	19.88	225817	23.88	148036	24.88	226950	29.88
0.080	0.125	0.240	1-1/2	146914	19.88	225828	23.88	148047	24.88	226961	29.88
0.081	0.125	0.243	1-1/2	146925	19.88	225839	23.88	148058	24.88	226972	29.88
0.082	0.125	0.246	1-1/2	146936	19.88	225850	23.88	148069	24.88	226983	29.88
0.083	0.125	0.249	1-1/2	146947	19.88	225861	23.88	148080	24.88	226994	29.88
0.084	0.125	0.252	1-1/2	146958	19.88	225872	23.88	148091	24.88	227005	29.88
0.085	0.125	0.255	1-1/2	146969	19.88	225883	23.88	148102	24.88	227016	29.88
0.086	0.125	0.258	1-1/2	146980	19.88	225894	23.88	148113	24.88	227027	29.88
0.087	0.125	0.261	1-1/2	146991	19.88	225905	23.88	148124	24.88	227038	29.88
0.088	0.125	0.264	1-1/2	147002	19.88	225916	23.88	148135	24.88	227049	29.88
0.089	0.125	0.267	1-1/2	147013	19.88	225927	23.88	148146	24.88	227060	29.88
0.090	0.125	0.270	1-1/2	147024	19.88	225938	23.88	148157	24.88	227071	29.88
0.091	0.125	0.273	1-1/2	147035	19.88	225949	23.88	148168	24.88	227082	29.88
0.092	0.125	0.276	1-1/2	147046	19.88	225960	23.88	148179	24.88	227093	29.88
0.093	0.125	0.279	1-1/2	147057	19.88	225971	23.88	148190	24.88	227104	29.88
0.094	0.125	0.282	1-1/2	147068	19.88	225982	23.88	148201	24.88	227115	29.88
0.095	0.125	0.285	1-1/2	147079	19.88	225993	23.88	148212	24.88	227126	29.88
0.096	0.125	0.288	1-1/2	147090	19.88	226004	23.88	148223	24.88	227137	29.88
0.097	0.125	0.291	1-1/2	147101	19.88	226015	23.88	148234	24.88	227148	29.88
0.098	0.125	0.294	1-1/2	147112	19.88	226026	23.88	148245	24.88	227159	29.88
0.099	0.125	0.297	1-1/2	147123	19.88	226037	23.88	148256	24.88	227170	29.88
0.100	0.125	0.300	1-1/2	147134	19.88	226048	23.88	148267	24.88	227181	29.88
0.101	0.125	0.303	1-1/2	147145	19.88	226059	23.88	148278	24.88	227192	29.88
0.102	0.125	0.306	1-1/2	147156	19.88	226070	23.88	148289	24.88	227203	29.88
0.103	0.125	0.309	1-1/2	147167	19.88	226081	23.88	148300	24.88	227214	29.88
0.104	0.125	0.312	1-1/2	147178	19.88	226092	23.88	148311	24.88	227225	29.88
0.105	0.125	0.315	1-1/2	147189	19.88	226103	23.88	148322	24.88	227236	29.88
0.106	0.125	0.318	1-1/2	147200	19.88	226114	23.88	148333	24.88	227247	29.88
0.107	0.125	0.321	1-1/2	147211	19.88	226125	23.88	148344	24.88	227258	29.88
0.108	0.125	0.324	1-1/2	147222	19.88	226136	23.88	148355	24.88	227269	29.88
0.109	0.125	0.327	1-1/2	147233	19.88	226147	23.88	148366	24.88	227280	29.88
0.110	0.125	0.330	1-1/2	147244	19.88	226158	23.88	148377	24.88	227291	29.88
0.115	0.125	0.345	1-1/2	147255	19.88	226169	23.88	148388	24.88	227302	29.88
0.120	0.125	0.360	1-1/2	147266	19.88	226180	23.88	148399	24.88	227313	29.88

LENGTH OF CUT = 3 X DIAMETER

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

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Solid Carbide Micro Endmills

## 2 FLUTE - STUB FLUTE - 30° HELIX



SQUARE END - UNCOATED



BALL NOSE - UNCOATED



SQUARE END - ALTIM COATED



BALL NOSE - ALTIM COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIM	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIM	LIST PRICE
0.005	0.125	0.008	1-1/2	220526	52.30	220801	62.76	221076	65.36	221351	78.45
0.010	0.125	0.015	1-1/2	220537	46.88	220812	56.24	221087	58.61	221362	70.30
0.015	0.125	0.023	1-1/2	220548	29.33	220823	35.21	221098	36.67	221373	44.00
0.020	0.125	0.030	1-1/2	220559	26.67	220834	32.00	221109	33.33	221384	40.00
0.025	0.125	0.038	1-1/2	220570	26.67	220845	32.00	221120	33.33	221395	40.00
0.030	0.125	0.045	1-1/2	220581	25.03	220856	30.03	221131	31.27	221406	37.52
0.031	0.125	0.047	1-1/2	220592	23.45	220867	28.12	221142	29.33	221417	35.21
0.035	0.125	0.053	1-1/2	220603	23.45	220878	28.12	221153	29.33	221428	35.21
0.040	0.125	0.060	1-1/2	220614	23.45	220889	28.12	221164	29.33	221439	35.21
0.045	0.125	0.068	1-1/2	220625	22.88	220900	27.45	221175	28.61	221450	34.36
0.047	0.125	0.071	1-1/2	220636	22.88	220911	27.45	221186	28.61	221461	34.36
0.050	0.125	0.075	1-1/2	220647	22.88	220922	27.45	221197	28.61	221472	34.36
0.055	0.125	0.083	1-1/2	220658	22.88	220933	27.45	221208	28.61	221483	34.36
0.060	0.125	0.090	1-1/2	220669	22.88	220944	27.45	221219	28.61	221494	34.36
0.062	0.125	0.093	1-1/2	220680	22.88	220955	27.45	221230	28.61	221505	34.36
0.065	0.125	0.098	1-1/2	220691	22.88	220966	27.45	221241	28.61	221516	34.36
0.070	0.125	0.105	1-1/2	220702	22.88	220977	27.45	221252	28.61	221527	34.36
0.075	0.125	0.113	1-1/2	220713	22.88	220988	27.45	221263	28.61	221538	34.36
0.078	0.125	0.117	1-1/2	220724	22.88	220999	27.45	221274	28.61	221549	34.36
0.080	0.125	0.120	1-1/2	220735	22.88	221010	27.45	221285	28.61	221560	34.36
0.085	0.125	0.128	1-1/2	220746	22.88	221021	27.45	221296	28.61	221571	34.36
0.090	0.125	0.135	1-1/2	220757	22.88	221032	27.45	221307	28.61	221582	34.36
0.093	0.125	0.140	1-1/2	220768	22.88	221043	27.45	221318	28.61	221593	34.36
0.095	0.125	0.143	1-1/2	220779	22.88	221054	27.45	221329	28.61	221604	34.36
0.100	0.125	0.150	1-1/2	220790	22.88	221065	27.45	221340	28.61	221615	34.36

LENGTH OF CUT = 1.5 X DIAMETER

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.005, -0.005	-0.001, -0.003

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Solid Carbide Micro Endmills



## 4 FLUTE - STUB FLUTE - 30° HELIX



**SQUARE END - UNCOATED**



**BALL NOSE - UNCOATED**



**SQUARE END - ALTIN COATED**



**BALL NOSE - ALTIN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.010	0.125	0.015	1-1/2	221626	46.88	221890	56.24	222154	50.97	222418	70.30
0.015	0.125	0.023	1-1/2	221637	29.33	221901	35.21	222165	31.88	222429	44.00
0.020	0.125	0.030	1-1/2	221648	26.67	221912	32.00	222176	29.00	222440	40.00
0.025	0.125	0.038	1-1/2	221659	26.67	221923	32.00	222187	29.00	222451	40.00
0.030	0.125	0.045	1-1/2	221670	25.03	221934	30.03	222198	27.21	222462	37.52
0.031	0.125	0.047	1-1/2	221681	23.45	221945	28.12	222209	25.52	222473	35.21
0.035	0.125	0.053	1-1/2	221692	23.45	221956	28.12	222220	25.52	222484	35.21
0.040	0.125	0.060	1-1/2	221703	23.45	221967	28.12	222231	25.52	222495	35.21
0.045	0.125	0.068	1-1/2	221714	22.88	221978	27.45	222242	24.88	222506	34.36
0.047	0.125	0.071	1-1/2	221725	22.88	221989	27.45	222253	24.88	222517	34.36
0.050	0.125	0.075	1-1/2	221736	22.88	222000	27.45	222264	24.88	222528	34.36
0.055	0.125	0.083	1-1/2	221747	22.88	222011	27.45	222275	24.88	222539	34.36
0.060	0.125	0.090	1-1/2	221758	22.88	222022	27.45	222286	24.88	222550	34.36
0.062	0.125	0.093	1-1/2	221769	22.88	222033	27.45	222297	24.88	222561	34.36
0.065	0.125	0.098	1-1/2	221780	22.88	222044	27.45	222308	24.88	222572	34.36
0.070	0.125	0.105	1-1/2	221791	22.88	222055	27.45	222319	24.88	222583	34.36
0.075	0.125	0.113	1-1/2	221802	22.88	222066	27.45	222330	24.88	222594	34.36
0.078	0.125	0.117	1-1/2	221813	22.88	222077	27.45	222341	24.88	222605	34.36
0.080	0.125	0.120	1-1/2	221824	22.88	222088	27.45	222352	24.88	222616	34.36
0.085	0.125	0.128	1-1/2	221835	22.88	222099	27.45	222363	24.88	222627	34.36
0.090	0.125	0.135	1-1/2	221846	22.88	222110	27.45	222374	24.88	222638	34.36
0.093	0.125	0.140	1-1/2	221857	22.88	222121	27.45	222385	24.88	222649	34.36
0.095	0.125	0.143	1-1/2	221868	22.88	222132	27.45	222396	24.88	222660	34.36
0.100	0.125	0.150	1-1/2	221879	22.88	222143	27.45	222407	24.88	222671	34.36

LENGTH OF CUT = 1.5 X DIAMETER

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

**MADE IN THE USA**

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Solid Carbide Micro Endmills

## Ⓜ CORNER RADIUS - 4 FLUTE - STUB FLUTE - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
0.015	0.125	0.023	1-1/2	0.003	218722	62.03	219173	76.91
0.020	0.125	0.030	1-1/2	0.005	218733	57.91	219184	71.79
0.025	0.125	0.038	1-1/2	0.005	218744	57.91	219195	71.79
0.030	0.125	0.045	1-1/2	0.005	218755	41.36	219206	51.27
0.030	0.125	0.045	1-1/2	0.010	218766	41.36	219217	51.27
0.031	0.125	0.047	1-1/2	0.005	218777	41.36	219228	51.27
0.031	0.125	0.047	1-1/2	0.010	218788	41.36	219239	51.27
0.035	0.125	0.053	1-1/2	0.005	218799	41.36	219250	51.27
0.035	0.125	0.053	1-1/2	0.010	218810	41.36	219261	51.27
0.040	0.125	0.060	1-1/2	0.005	218821	41.36	219272	51.27
0.040	0.125	0.060	1-1/2	0.010	218832	41.36	219283	51.27
0.045	0.125	0.068	1-1/2	0.005	218843	41.36	219294	51.27
0.045	0.125	0.068	1-1/2	0.010	218854	41.36	219305	51.27
0.045	0.125	0.068	1-1/2	0.015	218865	41.36	219316	51.27
0.047	0.125	0.071	1-1/2	0.005	218876	41.36	219327	51.27
0.047	0.125	0.071	1-1/2	0.010	218887	41.36	219338	51.27
0.047	0.125	0.071	1-1/2	0.015	218898	41.36	219349	51.27
0.050	0.125	0.075	1-1/2	0.005	218909	41.36	219360	51.27
0.050	0.125	0.075	1-1/2	0.010	218920	41.36	219371	51.27
0.050	0.125	0.075	1-1/2	0.015	218931	41.36	219382	51.27
0.060	0.125	0.090	1-1/2	0.005	218942	41.36	219393	51.27
0.060	0.125	0.090	1-1/2	0.010	218953	41.36	219404	51.27
0.060	0.125	0.090	1-1/2	0.015	218964	41.36	219415	51.27
0.062	0.125	0.093	1-1/2	0.005	218975	41.36	219426	51.27
0.062	0.125	0.093	1-1/2	0.010	218986	41.36	219437	51.27
0.062	0.125	0.093	1-1/2	0.015	218997	41.36	219448	51.27
0.075	0.125	0.113	1-1/2	0.005	219008	41.36	219459	51.27
0.075	0.125	0.113	1-1/2	0.010	219019	41.36	219470	51.27
0.075	0.125	0.113	1-1/2	0.015	219030	41.36	219481	51.27
0.078	0.125	0.117	1-1/2	0.005	219041	41.36	219492	51.27
0.078	0.125	0.117	1-1/2	0.010	219052	41.36	219503	51.27
0.078	0.125	0.117	1-1/2	0.015	219063	41.36	219514	51.27
0.090	0.125	0.135	1-1/2	0.005	219074	41.36	219525	51.27
0.090	0.125	0.135	1-1/2	0.010	219085	41.36	219536	51.27
0.090	0.125	0.135	1-1/2	0.015	219096	41.36	219547	51.27
0.093	0.125	0.140	1-1/2	0.005	219107	41.36	219558	51.27
0.093	0.125	0.140	1-1/2	0.010	219118	41.36	219569	51.27
0.093	0.125	0.140	1-1/2	0.015	219129	41.36	219580	51.27
0.100	0.125	0.150	1-1/2	0.005	219140	41.36	219591	51.27
0.100	0.125	0.150	1-1/2	0.010	219151	41.36	219602	51.27
0.100	0.125	0.150	1-1/2	0.015	219162	41.36	219613	51.27

LENGTH OF CUT = 1.5 X DIAMETER

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.005, -0.005	-0.001, -0.003	+0.003, -0.003

CARBIDE ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

# Solid Carbide Micro Endmills



## ® CORNER RADIUS - 4 FLUTE - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	® RADIUS	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
0.015	0.125	0.045	1-1/2	0.003	219624	62.03	220075	76.91
0.020	0.125	0.060	1-1/2	0.005	219635	57.91	220086	71.79
0.025	0.125	0.075	1-1/2	0.005	219646	57.91	220097	71.79
0.030	0.125	0.090	1-1/2	0.005	219657	41.36	220108	51.27
0.030	0.125	0.090	1-1/2	0.010	219668	41.36	220119	51.27
0.031	0.125	0.093	1-1/2	0.005	219679	41.36	220130	51.27
0.031	0.125	0.093	1-1/2	0.010	219690	41.36	220141	51.27
0.035	0.125	0.105	1-1/2	0.005	219701	41.36	220152	51.27
0.035	0.125	0.105	1-1/2	0.010	219712	41.36	220163	51.27
0.040	0.125	0.120	1-1/2	0.005	219723	41.36	220174	51.27
0.040	0.125	0.120	1-1/2	0.010	219734	41.36	220185	51.27
0.045	0.125	0.135	1-1/2	0.005	219745	41.36	220196	51.27
0.045	0.125	0.135	1-1/2	0.010	219756	41.36	220207	51.27
0.045	0.125	0.135	1-1/2	0.015	219767	41.36	220218	51.27
0.047	0.125	0.141	1-1/2	0.005	219778	41.36	220229	51.27
0.047	0.125	0.141	1-1/2	0.010	219789	41.36	220240	51.27
0.047	0.125	0.141	1-1/2	0.015	219800	41.36	220251	51.27
0.050	0.125	0.150	1-1/2	0.005	219811	41.36	220262	51.27
0.050	0.125	0.150	1-1/2	0.010	219822	41.36	220273	51.27
0.050	0.125	0.150	1-1/2	0.015	219833	41.36	220284	51.27
0.060	0.125	0.180	1-1/2	0.005	219844	41.36	220295	51.27
0.060	0.125	0.180	1-1/2	0.010	219855	41.36	220306	51.27
0.060	0.125	0.180	1-1/2	0.015	219866	41.36	220317	51.27
0.062	0.125	0.186	1-1/2	0.005	219877	41.36	220328	51.27
0.062	0.125	0.186	1-1/2	0.010	219888	41.36	220339	51.27
0.062	0.125	0.186	1-1/2	0.015	219899	41.36	220350	51.27
0.075	0.125	0.225	1-1/2	0.005	219910	41.36	220361	51.27
0.075	0.125	0.225	1-1/2	0.010	219921	41.36	220372	51.27
0.075	0.125	0.225	1-1/2	0.015	219932	41.36	220383	51.27
0.078	0.125	0.234	1-1/2	0.005	219943	41.36	220394	51.27
0.078	0.125	0.234	1-1/2	0.010	219954	41.36	220405	51.27
0.078	0.125	0.234	1-1/2	0.015	219965	41.36	220416	51.27
0.090	0.125	0.270	1-1/2	0.005	219976	41.36	220427	51.27
0.090	0.125	0.270	1-1/2	0.010	219987	41.36	220438	51.27
0.090	0.125	0.270	1-1/2	0.015	219998	41.36	220449	51.27
0.093	0.125	0.279	1-1/2	0.005	220009	41.36	220460	51.27
0.093	0.125	0.279	1-1/2	0.010	220020	41.36	220471	51.27
0.093	0.125	0.279	1-1/2	0.015	220031	41.36	220482	51.27
0.100	0.125	0.300	1-1/2	0.005	220042	41.36	220493	51.27
0.100	0.125	0.300	1-1/2	0.010	220053	41.36	220504	51.27
0.100	0.125	0.300	1-1/2	0.015	220064	41.36	220515	51.27

LENGTH OF CUT = 3.0 X DIAMETER

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.005, -0.005	-0.001, -0.003	+0.003, -0.003



# Solid Carbide Threadmills

## INTERNAL / EXTERNAL - UN THREADS



ALTIM COATED

SIZE	SHANK DIAMETER	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
6 - 32	1/8	0.100	0.218	2	3	156253	152.45
8 - 32	1/8	0.115	0.250	2	3	156264	152.45
8 - 36	1/8	0.115	0.250	2	3	156275	152.45
10 - 24	3/16	0.120	0.312	2	3	156286	152.45
10 - 32	3/16	0.120	0.312	2	3	156297	152.45
1/4 - 20	3/16	0.180	0.500	2-1/2	3	156308	172.43
1/4 - 28	3/16	0.180	0.500	2-1/2	3	156319	172.43
5/16 - 18	1/4	0.240	0.625	2-1/2	3	156330	202.91
5/16 - 24	1/4	0.240	0.625	2-1/2	3	156341	202.91
3/8 - 16	5/16	0.290	0.750	3	4	156352	241.78
3/8 - 24	5/16	0.290	0.750	3	4	156363	241.78
7/16 - 14	3/8	0.340	0.875	3	4	156374	260.73
7/16 - 20	3/8	0.340	0.875	3	4	156385	260.73
1/2 - 13	3/8	0.350	0.875	3-1/2	4	156396	260.73
1/2 - 20	3/8	0.350	0.875	3-1/2	4	156407	260.73
9/16 - 12	1/2	0.370	0.875	3-1/2	4	156418	260.73
9/16 - 18	1/2	0.370	0.875	3-1/2	4	156429	260.73
5/8 - 11	1/2	0.470	1.250	3-1/2	5	156440	325.90
5/8 - 18	1/2	0.470	1.250	3-1/2	5	156451	325.90
3/4 - 10	1/2	0.495	1.250	3-1/2	5	156462	325.90
3/4 - 16	1/2	0.495	1.250	3-1/2	5	156473	325.90
7/8 - 9	5/8	0.620	1.250	3-1/2	5	156484	407.91
7/8 - 14	5/8	0.620	1.250	3-1/2	5	156495	407.91
1 - 8	3/4	0.620	1.375	4	5	156506	407.91
1 - 12	3/4	0.620	1.375	4	5	156517	407.91

## INTERNAL / EXTERNAL - NPT PIPE THREADS



ALTIM COATED

SIZE	SHANK DIAMETER	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/16 - 27	1/4	0.245	0.437	2-1/2	3	156528	202.91
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156539	202.91
1/4 - 18	3/8	0.370	0.625	3	4	156550	231.27
3/8 - 18	3/8	0.370	0.625	3	4	156561	231.27
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156572	325.90
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156583	325.90
1 - 11-1/2	3/4	0.620	1.125	4	5	156594	407.91

THREADMILL CUTTING DIAMETER TOLERANCE

+0.000, -.002

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

CARBIDE THREADMILLS

# Solid Carbide Threadmills



## INTERNAL / EXTERNAL - NPTF PIPE THREADS



ALTiN COATED

SIZE	SHANK DIAMETER	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/16 - 27	1/4	0.245	0.437	2-1/2	3	156605	202.91
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156616	202.91
1/4 - 18	3/8	0.370	0.625	3	4	156627	231.27
3/8 - 18	3/8	0.370	0.625	3	4	156638	231.27
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156649	325.90
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156660	325.90
1 - 11-1/2	3/4	0.620	1.125	4	5	156671	407.91

## INTERNAL / EXTERNAL - METRIC THREADS



ALTiN COATED

SIZE	SHANK DIAMETER	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
M4 x 0.70	1/8	0.115	0.250	2	3	156682	155.60
M4.5 x 0.75	1/8	0.120	0.250	2	3	156693	155.60
M5 x 0.80	3/16	0.120	0.312	2	3	156704	155.60
M6 x 1.00	3/16	0.170	0.500	2-1/2	3	156715	171.37
M8 x 0.75	1/4	0.235	0.625	2-1/2	3	156726	202.91
M8 x 1.00	1/4	0.235	0.625	2-1/2	3	156737	202.91
M8 x 1.25	1/4	0.235	0.625	2-1/2	3	156748	202.91
M10 x 1.25	5/16	0.300	0.750	3	4	156759	241.78
M10 x 1.50	5/16	0.300	0.750	3	4	156770	241.78
M12 x 1.00	3/8	0.360	0.875	3-1/2	4	156781	261.76
M12 x 1.25	3/8	0.360	0.875	3-1/2	4	156792	261.76
M12 x 1.75	3/8	0.360	0.875	3-1/2	4	156803	261.76
M14 x 1.50	3/8	0.360	0.875	3-1/2	4	156814	261.76
M16 x 2.00	1/2	0.470	1.250	3-1/2	5	156825	325.90
M18 x 2.50	1/2	0.470	1.250	3-1/2	5	156836	325.90
M20 x 3.00	5/8	0.470	1.250	3-1/2	5	156847	325.90

THREADMILL CUTTING DIAMETER TOLERANCE

+0.00, -.002

MADE IN THE USA

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Drill Mills

## 2 FLUTE - 60° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	242034	20.53
1/16	1/8	3/16	1-1/2	2	242045	20.53
3/32	1/8	3/8	1-1/2	2	242056	20.53
1/8	1/8	1/2	1-1/2	2	242067	19.69
3/16	3/16	5/8	2	2	242078	27.72
1/4	1/4	3/4	2-1/2	2	242089	34.69
5/16	5/16	13/16	2-1/2	2	242100	43.07
3/8	3/8	1	2-1/2	2	242111	54.12
7/16	7/16	1	2-3/4	2	242122	73.17
1/2	1/2	1	3	2	242133	89.71
5/8	5/8	1-1/4	3-1/2	2	242144	171.30
3/4	3/4	1-1/2	4	2	242155	252.31



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	242166	25.66
1/16	1/8	3/16	1-1/2	2	242177	25.66
3/32	1/8	3/8	1-1/2	2	242188	25.66
1/8	1/8	1/2	1-1/2	2	242199	24.64
3/16	3/16	5/8	2	2	242210	34.66
1/4	1/4	3/4	2-1/2	2	242221	43.36
5/16	5/16	13/16	2-1/2	2	242232	53.84
3/8	3/8	1	2-1/2	2	242243	67.68
7/16	7/16	1	2-3/4	2	242254	91.48
1/2	1/2	1	3	2	242265	112.17
5/8	5/8	1-1/4	3-1/2	2	242276	214.15
3/4	3/4	1-1/2	4	2	242287	315.40

Drill mills enjoy great popularity in job shop environments because of their versatility in performing a wide range of applications.

The following applications can be performed with drill mills:  
 Drilling • Chamfering • Countersinking • Spotting • Profile Milling

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -0.0004
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

CARBIDE DRILL MILLS

# Solid Carbide Drill Mills



## 4 FLUTE - 60° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	242628	20.53
1/16	1/8	3/16	1-1/2	4	242639	20.53
3/32	1/8	3/8	1-1/2	4	242650	20.53
1/8	1/8	1/2	1-1/2	4	242661	19.69
3/16	3/16	5/8	2	4	242672	27.72
1/4	1/4	3/4	2-1/2	4	242683	34.69
5/16	5/16	13/16	2-1/2	4	242694	43.07
3/8	3/8	1	2-1/2	4	242705	54.12
7/16	7/16	1	2-3/4	4	242716	73.17
1/2	1/2	1	3	4	242727	89.71
5/8	5/8	1-1/4	3-1/2	4	242738	171.30
3/4	3/4	1-1/2	4	4	242749	252.31



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	242760	25.66
1/16	1/8	3/16	1-1/2	4	242771	25.66
3/32	1/8	3/8	1-1/2	4	242782	25.66
1/8	1/8	1/2	1-1/2	4	242793	24.64
3/16	3/16	5/8	2	4	242804	34.66
1/4	1/4	3/4	2-1/2	4	242815	43.36
5/16	5/16	13/16	2-1/2	4	242826	53.84
3/8	3/8	1	2-1/2	4	242837	67.68
7/16	7/16	1	2-3/4	4	242848	91.48
1/2	1/2	1	3	4	242859	112.17
5/8	5/8	1-1/4	3-1/2	4	242870	214.15
3/4	3/4	1-1/2	4	4	242881	315.40

Drill mills enjoy great popularity in job shop environments because of their versatility in performing a wide range of applications.

The following applications can be performed with drill mills:  
 Drilling • Chamfering • Countersinking • Spotting • Profile Milling

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -0.0004
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Drill Mills

## 2 FLUTE - 90° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	241545	20.53
1/16	1/8	3/16	1-1/2	2	241550	20.53
3/32	1/8	3/8	1-1/2	2	241561	20.53
1/8	1/8	1/2	1-1/2	2	241572	19.69
3/16	3/16	5/8	2	2	241583	27.72
1/4	1/4	3/4	2-1/2	2	241594	34.69
5/16	5/16	13/16	2-1/2	2	241605	43.07
3/8	3/8	1	2-1/2	2	241616	54.12
7/16	7/16	1	2-3/4	2	241627	73.17
1/2	1/2	1	3	2	241638	89.71
5/8	5/8	1-1/4	3-1/2	2	241649	171.30
3/4	3/4	1-1/2	4	2	241660	252.31



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	241668	25.66
1/16	1/8	3/16	1-1/2	2	241671	25.66
3/32	1/8	3/8	1-1/2	2	241682	25.66
1/8	1/8	1/2	1-1/2	2	241693	24.64
3/16	3/16	5/8	2	2	241704	34.66
1/4	1/4	3/4	2-1/2	2	241715	43.36
5/16	5/16	13/16	2-1/2	2	241726	53.84
3/8	3/8	1	2-1/2	2	241737	67.68
7/16	7/16	1	2-3/4	2	241748	91.48
1/2	1/2	1	3	2	241759	112.17
5/8	5/8	1-1/4	3-1/2	2	241770	214.15
3/4	3/4	1-1/2	4	2	241781	315.40

Drill mills enjoy great popularity in job shop environments because of their versatility in performing a wide range of applications.

The following applications can be performed with drill mills:  
 Drilling • Chamfering • Countersinking • Spotting • Profile Milling

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -0.0004
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

CARBIDE DRILL MILLS

# Solid Carbide Drill Mills



## 4 FLUTE - 90° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	241785	20.53
1/16	1/8	3/16	1-1/2	4	241792	20.53
3/32	1/8	3/8	1-1/2	4	241803	20.53
1/8	1/8	1/2	1-1/2	4	241814	19.69
3/16	3/16	5/8	2	4	241825	27.72
1/4	1/4	3/4	2-1/2	4	241836	34.69
5/16	5/16	13/16	2-1/2	4	241847	43.07
3/8	3/8	1	2-1/2	4	241858	54.12
7/16	7/16	1	2-3/4	4	241869	73.17
1/2	1/2	1	3	4	241880	89.71
5/8	5/8	1-1/4	3-1/2	4	241891	171.30
3/4	3/4	1-1/2	4	4	241902	252.31



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	241908	25.66
1/16	1/8	3/16	1-1/2	4	241913	25.66
3/32	1/8	3/8	1-1/2	4	241924	25.66
1/8	1/8	1/2	1-1/2	4	241935	24.64
3/16	3/16	5/8	2	4	241946	34.66
1/4	1/4	3/4	2-1/2	4	241957	43.36
5/16	5/16	13/16	2-1/2	4	241968	53.84
3/8	3/8	1	2-1/2	4	241979	67.68
7/16	7/16	1	2-3/4	4	241990	91.48
1/2	1/2	1	3	4	242001	112.17
5/8	5/8	1-1/4	3-1/2	4	242012	214.15
3/4	3/4	1-1/2	4	4	242023	315.40

Drill mills enjoy great popularity in job shop environments because of their versatility in performing a wide range of applications.

The following applications can be performed with drill mills:  
 Drilling • Chamfering • Countersinking • Spotting • Profile Milling

TOLERANCES	DIAMETER	SHANK
1/32" - 3/32"	+0.000, -0.001	-0.0001, -0.0004
1/8" - 1/2"	+0.000, -0.002	-0.0001, -0.0004
5/8" - 3/4"	+0.000, -0.003	-0.0001, -0.0004

CARBIDE DRILL MILLS  
 CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Chamfer Mills



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	17.75
1/4	1/4	2-1/2	1	252520	252564	252608	252652	252696	31.25
3/8	3/8	2-1/2	1	252531	252575	252619	252663	252707	48.75
1/2	1/2	3	1	252542	252586	252630	252674	252718	80.70



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	22.20
1/4	1/4	2-1/2	1	252740	252784	252828	252872	252916	39.00
3/8	3/8	2-1/2	1	252751	252795	252839	252883	252927	60.95
1/2	1/2	3	1	252762	252806	252850	252894	252938	100.95



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	17.75
1/4	1/4	2-1/2	1	252960	253004	253048	253092	253136	31.25
3/8	3/8	2-1/2	1	252971	253015	253059	253103	253147	48.75
1/2	1/2	3	1	252982	253026	253070	253114	253158	80.70



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	22.20
1/4	1/4	2-1/2	1	253180	253224	253268	253312	253356	39.00
3/8	3/8	2-1/2	1	253191	253235	253279	253323	253367	60.95
1/2	1/2	3	1	253202	253246	253290	253334	253378	100.95

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE CHAMFER MILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

# Solid Carbide Chamfer Mills



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	31.95
3/16	3/16	2-1/2	1	253400	253466	253532	253598	253664	44.00
1/4	1/4	2-1/2	1	253411	253477	253543	253609	253675	56.25
5/16	5/16	2-1/2	1	253422	253488	253554	253620	253686	72.00
3/8	3/8	2-1/2	1	253433	253499	253565	253631	253697	87.75
1/2	1/2	3	1	253444	253510	253576	253642	253708	145.26



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	39.96
3/16	3/16	2-1/2	1	253730	253796	253862	253928	253994	55.00
1/4	1/4	2-1/2	1	253741	253807	253873	253939	254005	70.20
5/16	5/16	2-1/2	1	253752	253818	253884	253950	254016	89.95
3/8	3/8	2-1/2	1	253763	253829	253895	253961	254027	109.80
1/2	1/2	3	1	253774	253840	253906	253972	254038	181.75



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	31.95
3/16	3/16	2-1/2	1	254060	254126	254192	254258	254324	44.00
1/4	1/4	2-1/2	1	254071	254137	254203	254269	254335	56.25
5/16	5/16	2-1/2	1	254082	254148	254214	254280	254346	72.00
3/8	3/8	2-1/2	1	254093	254159	254225	254291	254357	87.75
1/2	1/2	3	1	254104	254170	254236	254302	254368	145.26



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

SIZE	SHANK DIA.	OVERALL LENGTH	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	39.96
3/16	3/16	2-1/2	1	254390	254456	254522	254588	254654	55.00
1/4	1/4	2-1/2	1	254401	254467	254533	254599	254665	70.20
5/16	5/16	2-1/2	1	254412	254478	254544	254610	254676	89.95
3/8	3/8	2-1/2	1	254423	254489	254555	254621	254687	109.80
1/2	1/2	3	1	254434	254500	254566	254632	254698	181.75

CARBIDE CHAMFER MILLS  
 CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Drills

## N/C SPOTTING DRILLS



**90° POINT  
UNCOATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138686	24.16
3/16	3/16	3/8	2	138697	28.75
1/4	1/4	3/8	3	138708	34.92
3/8	3/8	1/2	4	138719	55.51
1/2	1/2	3/4	4	138730	92.77
5/8	5/8	1	4	138741	165.14
3/4	3/4	1	4	138752	221.73



**120° POINT  
UNCOATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138763	24.16
3/16	3/16	3/8	2	138774	28.75
1/4	1/4	3/8	3	138785	34.92
3/8	3/8	1/2	4	138796	55.51
1/2	1/2	3/4	4	138807	92.77
5/8	5/8	1	4	138818	165.14
3/4	3/4	1	4	138829	221.73



**140° POINT  
UNCOATED**

**N/C SPOTTING FOR HIGH PERFORMANCE DRILLING**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138840	24.16
3/16	3/16	3/8	2	138851	28.75
1/4	1/4	3/8	3	138862	34.92
3/8	3/8	1/2	4	138873	55.51
1/2	1/2	3/4	4	138884	92.77
5/8	5/8	1	4	138895	165.14
3/4	3/4	1	4	138906	221.73

CARBIDE N/C SPOTTING DRILLS

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

# Solid Carbide Drills



## N/C SPOTTING DRILLS



**90° POINT  
ALTiN COATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138753	30.19
3/16	3/16	3/8	2	138754	35.94
1/4	1/4	3/8	3	138755	43.85
3/8	3/8	1/2	4	138756	69.38
1/2	1/2	3/4	4	138757	120.78
5/8	5/8	1	4	138758	211.13
3/4	3/4	1	4	138759	277.17



**120° POINT  
ALTiN COATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138830	30.19
3/16	3/16	3/8	2	138831	35.94
1/4	1/4	3/8	3	138832	43.85
3/8	3/8	1/2	4	138833	69.38
1/2	1/2	3/4	4	138834	120.78
5/8	5/8	1	4	138835	211.13
3/4	3/4	1	4	138836	277.17



**140° POINT  
ALTiN COATED**

### N/C SPOTTING FOR HIGH PERFORMANCE DRILLING

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138907	30.19
3/16	3/16	3/8	2	138908	35.94
1/4	1/4	3/8	3	138909	43.85
3/8	3/8	1/2	4	138910	69.38
1/2	1/2	3/4	4	138911	120.78
5/8	5/8	1	4	138912	211.13
3/4	3/4	1	4	138913	277.17

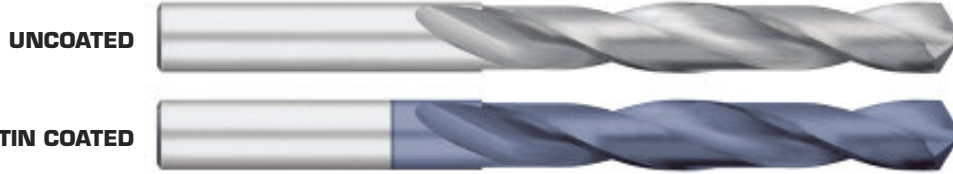
CARBIDE N/C SPOTTING DRILLS

- CARBIDE ENDMILLS
- CARBIDE MICRO ENDMILLS
- CARBIDE THREADMILLS
- CARBIDE DRILL MILLS
- CARBIDE REAMERS
- CARBIDE BURS
- COUNTERSINKS
- TAPS & DIES
- HSS & COBALT DRILLS
- HSS & COBALT ENDMILLS
- HSS & COBALT REAMERS



# Solid Carbide Drills

## JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX



UNCOATED

ALUMINUM COATED

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
1/32	5/16	1-1/4	138917	14.13	227324	17.67
3/64	3/4	1-1/2	138928	14.13	227335	17.67
1/16	3/4	1-1/2	138939	13.37	227346	16.70
5/64	7/8	1-3/4	138950	14.13	227357	17.67
3/32	1	2	138961	15.57	227368	19.47
7/64	1-1/4	2-1/4	138972	17.70	227379	22.13
1/8	1-1/4	2-1/4	138983	18.87	227390	23.60
9/64	1-3/8	2-1/2	138994	20.90	227401	26.13
5/32	1-3/8	2-1/2	139005	23.43	227412	29.30
11/64	1-5/8	2-3/4	139016	27.67	227423	34.60
3/16	1-5/8	2-3/4	139027	28.47	227434	35.57
13/64	1-3/4	3	139038	32.87	227445	41.10
7/32	1-3/4	3	139049	36.47	227456	45.60
15/64	2	3-1/4	139060	41.30	227467	51.60
1/4	2	3-1/4	139071	43.40	227478	54.23
17/64	2-1/8	3-1/2	139082	48.87	227489	61.10

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
9/32	2-1/8	3-1/2	139093	50.97	227500	63.73
19/64	2-3/8	3-3/4	139104	57.27	227511	71.57
5/16	2-3/8	3-3/4	139115	60.23	227522	75.27
21/64	2-1/2	4	139126	65.73	227533	82.17
11/32	2-1/2	4	139137	71.87	227544	89.83
23/64	2-3/4	4-1/4	139148	80.37	227555	100.47
3/8	2-3/4	4-1/4	139159	85.23	227566	106.53
25/64	2-7/8	4-1/2	139170	99.80	227577	124.73
13/32	2-7/8	4-1/2	139181	109.30	227588	136.63
27/64	2-7/8	4-1/2	139192	118.87	227599	148.57
7/16	2-7/8	4-1/2	139203	124.37	227610	155.50
29/64	3	4-3/4	139214	144.30	227621	180.37
15/32	3	4-3/4	139225	150.33	227632	187.90
31/64	3	4-3/4	139236	154.57	227643	193.23
1/2	3	4-3/4	139247	154.90	227654	193.63
-	-	-	-	-	-	-

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

### METRIC SIZES

SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
0.7	12	31	216775	17.57	228611	21.97
0.8	12	31	216786	17.57	228622	21.97
0.9	16	38	216797	17.57	228633	21.97
1.0	16	38	216808	17.57	228644	21.97
1.1	19	38	216819	17.57	228655	21.97
1.2	19	38	216830	17.57	228666	21.97
1.3	19	38	216841	17.57	228677	21.97
1.4	19	38	216852	17.57	228688	21.97
1.5	19	38	216863	17.70	228699	22.13
1.6	19	38	216874	17.70	228710	22.13
1.7	19	38	216885	17.70	228721	22.13
1.8	22	38	216896	17.70	228732	22.13
1.9	22	38	216907	17.70	228743	22.13
2.0	22	44	216918	18.80	228754	23.50
2.1	22	44	216929	18.80	228765	23.50
2.2	25	50	216940	18.80	228776	23.50
2.3	25	50	216951	18.80	228787	23.50
2.4	25	50	216962	18.80	228798	23.50
2.5	25	50	216973	21.60	228809	27.00
2.6	32	57	216984	21.60	228820	27.00
2.7	32	57	216995	21.60	228831	27.00
2.8	32	57	217006	21.60	228842	27.00
2.9	32	57	217017	21.60	228853	27.00

### METRIC SIZES

SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
3.0	32	57	217028	24.20	228864	30.23
3.1	32	57	217039	24.20	228875	30.23
3.2	32	57	217050	24.20	228886	30.23
3.3	32	57	217061	24.20	228897	30.23
3.4	35	63	217072	26.27	228908	32.87
3.5	35	63	217083	26.27	228919	32.87
4.0	35	63	217094	32.33	228930	40.40
4.5	41	70	217105	34.63	228941	43.30
5.0	44	75	217116	38.30	228952	47.90
5.5	44	75	217127	45.37	228963	56.70
6.0	50	82	217138	47.97	228974	59.93
6.5	50	82	217149	76.40	228985	95.50
7.0	54	89	217160	83.67	228996	104.60
7.5	60	95	217171	86.40	229007	108.00
8.0	60	95	217182	91.40	229018	114.23
8.5	63	100	217193	112.83	229029	141.03
9.0	70	100	217204	128.10	229040	160.13
9.5	70	108	217215	146.17	229051	182.73
10.0	73	114	217226	167.87	229062	209.83
10.5	73	114	217237	187.73	229073	234.67
11.0	73	114	217248	223.37	229084	279.23
11.5	76	120	217259	230.07	229095	287.60
12.0	76	120	217270	255.33	229106	319.20

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

NOTE: SIZES 3.1mm AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE +.0000, -.0005

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE JOBBER DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# Solid Carbide Drills



## JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX



UNCOATED



ALTiN COATED

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
A	2	3-1/4	139258	41.67	227665	52.07
B	2	3-1/4	139269	43.40	227676	54.23
C	2	3-1/4	139280	43.73	227687	54.67
D	2	3-1/4	139291	44.27	227698	55.33
E	2	3-1/4	139302	43.40	227709	54.23
F	2	3-1/4	139313	48.27	227720	60.33
G	2-1/8	3-1/2	139324	51.20	227731	63.97
H	2-1/8	3-1/2	139335	52.30	227742	65.37
I	2-1/8	3-1/2	139346	53.13	227753	66.43
J	2-1/8	3-1/2	139357	54.57	227764	68.23
K	2-1/8	3-1/2	139368	55.03	227775	68.80
L	2-1/8	3-1/2	139379	58.17	227786	72.73
M	2-3/8	3-3/4	139390	59.37	227797	74.20

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
N	2-3/8	3-3/4	139401	63.10	227808	78.87
O	2-3/8	3-3/4	139412	66.50	227819	83.13
P	2-3/8	3-3/4	139423	69.03	227830	86.30
Q	2-1/2	4	139434	71.57	227841	89.43
R	2-1/2	4	139445	74.70	227852	93.37
S	2-1/2	4	139456	79.57	227863	99.47
T	2-3/4	4-1/4	139467	82.43	227874	103.00
U	2-3/4	4-1/4	139478	86.50	227885	108.10
V	2-3/4	4-1/4	139489	95.80	227896	119.73
W	2-7/8	4-1/2	139500	103.17	227907	128.97
X	2-7/8	4-1/2	139511	112.60	227918	140.73
Y	2-7/8	4-1/2	139522	116.37	227929	145.47
Z	2-7/8	4-1/2	139533	126.10	227940	157.63

### WIRE SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1	1-3/4	3	139544	37.77	227951	47.20
2	1-3/4	3	139555	37.77	227962	47.20
3	1-3/4	3	139566	37.77	227973	47.20
4	1-3/4	3	139577	37.37	227984	46.70
5	1-3/4	3	139588	33.33	227995	41.70
6	1-3/4	3	139599	33.33	228006	41.70
7	1-3/4	3	139610	32.40	228017	40.50
8	1-3/4	3	139621	32.23	228028	40.30
9	1-3/4	3	139632	32.23	228039	40.30
10	1-5/8	2-3/4	139643	32.23	228050	40.30
11	1-5/8	2-3/4	139654	31.47	228061	39.30
12	1-5/8	2-3/4	139665	31.47	228072	39.30
13	1-5/8	2-3/4	139676	30.33	228083	37.93
14	1-5/8	2-3/4	139687	29.57	228094	36.97
15	1-5/8	2-3/4	139698	29.10	228105	36.37
16	1-5/8	2-3/4	139709	29.10	228116	36.37
17	1-5/8	2-3/4	139720	27.67	228127	34.60
18	1-5/8	2-3/4	139731	26.03	228138	32.53
19	1-5/8	2-3/4	139742	25.47	228149	31.83
20	1-3/8	2-1/2	139753	24.37	228160	30.47
21	1-3/8	2-1/2	139764	24.37	228171	30.47
22	1-3/8	2-1/2	139775	23.43	228182	29.30
23	1-3/8	2-1/2	139786	23.43	228193	29.30
24	1-3/8	2-1/2	139797	23.27	228204	29.10
25	1-3/8	2-1/2	139808	22.00	228215	27.53
26	1-3/8	2-1/2	139819	22.00	228226	27.53
27	1-3/8	2-1/2	139830	22.00	228237	27.53
28	1-3/8	2-1/2	139841	20.90	228248	26.13
29	1-3/8	2-1/2	139852	20.90	228259	26.13
30	1-1/4	2-1/4	139863	19.80	228270	24.77

### WIRE SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
31	1-1/4	2-1/4	139874	18.40	228281	23.00
32	1-1/4	2-1/4	139885	18.40	228292	23.00
33	1-1/4	2-1/4	139896	18.23	228303	22.80
34	1-1/4	2-1/4	139907	18.10	228314	22.60
35	1-1/4	2-1/4	139918	18.10	228325	22.60
36	1-1/4	2-1/4	139929	18.10	228336	22.60
37	1-1/4	2-1/4	139940	17.13	228347	21.43
38	1-1/4	2-1/4	139951	16.83	228358	21.03
39	1-1/4	2-1/4	139962	16.83	228369	21.03
40	1	2	139973	16.20	228380	20.23
41	1	2	139984	16.20	228391	20.23
42	1	2	139995	15.73	228402	19.67
43	1	2	140006	15.73	228413	19.67
44	1	2	140017	14.93	228424	18.67
45	7/8	1-3/4	140028	14.50	228435	18.10
46	7/8	1-3/4	140039	14.50	228446	18.10
47	7/8	1-3/4	140050	14.50	228457	18.10
48	7/8	1-3/4	140061	14.50	228468	18.10
49	7/8	1-3/4	140072	13.83	228479	17.30
50	7/8	1-3/4	140083	13.83	228490	17.30
51	3/4	1-1/2	140094	13.37	228501	16.70
52	3/4	1-1/2	140105	13.37	228512	16.70
53	3/4	1-1/2	140116	14.13	228523	17.67
54	3/4	1-1/2	140127	14.13	228534	17.67
55	3/4	1-1/2	140138	14.13	228545	17.67
56	3/4	1-1/2	140149	14.13	228556	17.67
57	3/4	1-1/2	140160	14.13	228567	17.67
58	3/4	1-1/2	140171	14.13	228578	17.67
59	3/4	1-1/2	140182	14.13	228589	17.67
60	3/4	1-1/2	140193	14.13	228600	17.67

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE      +.0000, -.0005



# Solid Carbide Drills

## STUB LENGTH - 135° SPLIT POINT - 15° HELIX

UNCOATED



ALTIN COATED



### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/32	3/8	1-1/2	141469	15.03	217358	18.80
3/64	3/8	1-1/2	141480	15.03	217369	18.80
1/16	13/32	1-1/2	141491	14.20	217380	17.73
5/64	7/16	1-1/2	141502	15.03	217391	18.80
3/32	1/2	1-1/2	141513	16.57	217402	20.70
7/64	5/8	2	141524	18.80	217413	23.50
1/8	3/4	2	141535	20.07	217424	25.07
9/64	3/4	2	141546	22.23	217435	27.77
5/32	7/8	2	141557	24.90	217446	31.10
11/64	7/8	2	141568	29.40	217457	36.77
3/16	7/8	2	141579	30.23	217468	37.80
13/64	1-1/8	2-1/2	141590	34.93	217479	43.67
7/32	1-1/8	2-1/2	141601	38.77	217490	48.47
15/64	1-1/4	2-1/2	141612	43.87	217501	54.83
1/4	1-1/4	2-1/2	141623	46.10	217512	57.63
17/64	1-1/4	2-1/2	141634	51.97	217523	64.93

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
9/32	1-1/4	2-1/2	141645	54.13	217534	67.67
19/64	1-1/4	2-1/2	141656	60.80	217545	76.03
5/16	1-1/4	2-1/2	141667	64.03	217556	80.00
21/64	1-3/8	3	141678	69.83	217567	87.30
11/32	1-3/8	3	141689	76.37	217578	95.43
23/64	1-3/8	3	141700	85.37	217589	106.70
3/8	1-3/8	3	141711	90.53	217600	113.17
25/64	1-3/8	3	141722	106.03	217611	132.53
13/32	1-3/8	3	141733	116.13	217622	145.17
27/64	1-3/8	3	141744	126.33	217633	157.90
7/16	1-3/8	3	141755	132.13	217644	165.17
29/64	1-3/8	3	141766	153.30	217655	191.63
15/32	1-3/8	3	141777	159.73	217666	199.67
31/64	1-3/8	3	141788	164.23	217677	205.30
1/2	1-3/8	3	141799	164.60	217688	205.73
-	-	-	-	-	-	-

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

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
A	1-1/4	2-1/2	141810	44.27	217699	55.33
B	1-1/4	2-1/2	141821	46.10	217710	57.63
C	1-1/4	2-1/2	141832	46.43	217721	58.07
D	1-1/4	2-1/2	141843	47.03	217732	58.77
E	1-1/4	2-1/2	141854	46.10	217743	57.63
F	1-1/4	2-1/2	141865	51.30	217754	64.10
G	1-1/4	2-1/2	141876	54.37	217765	67.97
H	1-1/4	2-1/2	141887	55.53	217776	69.43
I	1-1/4	2-1/2	141898	56.47	217787	70.60
J	1-1/4	2-1/2	141909	57.97	217798	72.47
K	1-1/4	2-1/2	141920	58.50	217809	73.10
L	1-1/4	2-1/2	141931	61.83	217820	77.27
M	1-1/4	2-1/2	141942	63.07	217831	78.87

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	1-1/4	2-1/2	141953	67.03	217842	83.77
O	1-3/8	3	141964	70.67	217853	88.33
P	1-3/8	3	141975	73.37	217864	91.70
Q	1-3/8	3	141986	76.03	217875	95.03
R	1-3/8	3	141997	79.37	217886	99.20
S	1-3/8	3	142008	84.53	217897	105.70
T	1-3/8	3	142019	87.57	217908	109.47
U	1-3/8	3	142030	91.90	217919	114.87
V	1-3/8	3	142041	101.77	217930	127.20
W	1-3/8	3	142052	109.60	217941	137.00
X	1-3/8	3	142063	119.63	217952	149.53
Y	1-3/8	3	142074	123.63	217963	154.53
Z	1-3/8	3	142085	134.00	217974	167.47

DIAMETER TOLERANCE +.0000, -.0005

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE STUB LENGTH DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# Solid Carbide Drills



## STUB LENGTH - 135° SPLIT POINT - 15° HELIX



UNCOATED



ALTiN COATED

WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1	1-1/4	2-1/2	142096	40.10	217985	50.13	31	3/4	2	142426	19.57	218315	24.43
2	1-1/4	2-1/2	142107	40.10	217996	50.13	32	3/4	2	142437	19.57	218326	24.43
3	1-1/8	2-1/2	142118	40.10	218007	50.13	33	3/4	2	142448	19.37	218337	24.23
4	1-1/8	2-1/2	142129	39.67	218018	49.60	34	3/4	2	142459	19.20	218348	24.00
5	1-1/8	2-1/2	142140	35.43	218029	44.27	35	3/4	2	142470	19.20	218359	24.00
6	1-1/8	2-1/2	142151	35.43	218040	44.27	36	5/8	2	142481	19.20	218370	24.00
7	1-1/8	2-1/2	142162	34.40	218051	43.00	37	5/8	2	142492	18.20	218381	22.77
8	1-1/8	2-1/2	142173	34.27	218062	42.83	38	5/8	2	142503	17.87	218392	22.33
9	1-1/8	2-1/2	142184	34.27	218073	42.83	39	5/8	2	142514	17.87	218403	22.33
10	1-1/8	2-1/2	142195	34.27	218084	42.83	40	5/8	2	142525	17.20	218414	21.53
11	1-1/8	2-1/2	142206	33.40	218095	41.77	41	5/8	2	142536	17.20	218425	21.53
12	1-1/8	2-1/2	142217	33.40	218106	41.77	42	1/2	1-1/2	142547	16.73	218436	20.90
13	7/8	2	142228	32.23	218117	40.30	43	1/2	1-1/2	142558	16.73	218447	20.90
14	7/8	2	142239	31.43	218128	39.30	44	1/2	1-1/2	142569	15.87	218458	19.83
15	7/8	2	142250	30.93	218139	38.63	45	1/2	1-1/2	142580	15.37	218469	19.20
16	7/8	2	142261	30.93	218150	38.63	46	1/2	1-1/2	142591	15.37	218480	19.20
17	7/8	2	142272	29.40	218161	36.77	47	1/2	1-1/2	142602	15.37	218491	19.20
18	7/8	2	142283	27.63	218172	34.57	48	7/16	1-1/2	142613	15.37	218502	19.20
19	7/8	2	142294	27.07	218183	33.83	49	7/16	1-1/2	142624	14.70	218513	18.37
20	7/8	2	142305	25.90	218194	32.40	50	7/16	1-1/2	142635	14.70	218524	18.37
21	7/8	2	142316	25.90	218205	32.40	51	7/16	1-1/2	142646	14.20	218535	17.73
22	7/8	2	142327	24.90	218216	31.10	52	7/16	1-1/2	142657	14.20	218546	17.73
23	7/8	2	142338	24.90	218227	31.10	53	13/32	1-1/2	142668	15.03	218557	18.80
24	7/8	2	142349	24.73	218238	30.93	54	13/32	1-1/2	142679	15.03	218568	18.80
25	7/8	2	142360	23.40	218249	29.23	55	13/32	1-1/2	142690	15.03	218579	18.80
26	7/8	2	142371	23.40	218260	29.23	56	3/8	1-1/2	142701	15.03	218590	18.80
27	7/8	2	142382	23.40	218271	29.23	57	3/8	1-1/2	142712	15.03	218601	18.80
28	3/4	2	142393	22.23	218282	27.77	58	3/8	1-1/2	142723	15.03	218612	18.80
29	3/4	2	142404	22.23	218293	27.77	59	3/8	1-1/2	142734	15.03	218623	18.80
30	3/4	2	142415	21.03	218304	26.30	60	3/8	1-1/2	142745	15.03	218634	18.80

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE      +.0000, -.0005



# Solid Carbide Drills

## STRAIGHT FLUTE - 140° SPLIT POINT

UNCOATED



ALTIM COATED



### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
1/32	3/8	1-1/2	140204	17.97	229117	22.47
3/64	3/8	1-1/2	140215	17.97	229128	22.47
1/16	13/32	1-1/2	140226	18.50	229139	23.10
5/64	7/16	1-1/2	140237	19.30	229150	24.13
3/32	1/2	1-1/2	140248	21.27	229161	26.60
7/64	5/8	2	140259	23.20	229172	29.00
1/8	3/4	2	140270	22.00	229183	27.50
9/64	3/4	2	140281	25.17	229194	31.43
5/32	7/8	2	140292	28.17	229205	35.23
11/64	7/8	2	140303	31.27	229216	39.07
3/16	7/8	2	140314	28.87	229227	36.07
13/64	1-1/8	2-1/2	140325	37.53	229238	46.97
7/32	1-1/8	2-1/2	140336	42.17	229249	52.73
15/64	1-1/4	2-1/2	140347	44.50	229260	55.63
1/4	1-1/4	2-1/2	140358	42.10	229271	52.63

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
17/64	1-1/4	2-1/2	140369	58.53	229282	73.13
9/32	1-1/4	2-1/2	140380	60.83	229293	76.07
19/64	1-1/4	2-1/2	140391	64.40	229304	80.50
5/16	1-1/4	2-1/2	140402	66.70	229315	83.37
21/64	1-3/8	3	140413	71.70	229326	89.60
11/32	1-3/8	3	140424	79.53	229337	99.40
23/64	1-3/8	3	140435	87.00	229348	108.77
3/8	1-3/8	3	140446	86.27	229359	107.83
25/64	1-3/8	3	140457	106.70	229370	133.37
13/32	1-3/8	3	140468	102.10	229381	127.63
27/64	1-3/8	3	140479	129.47	229392	161.80
7/16	1-3/8	3	140490	126.27	229403	157.83
15/32	1-3/8	3	140501	140.50	229414	175.63
1/2	1-3/8	3	140512	152.23	229425	190.30
-	-	-	-	-	-	-

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

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
A	1-1/4	2-1/2	140523	44.50	229436	55.63
B	1-1/4	2-1/2	140534	44.50	229447	55.63
C	1-1/4	2-1/2	140545	44.50	229458	55.63
D	1-1/4	2-1/2	140556	44.50	229469	55.63
E	1-1/4	2-1/2	140567	42.10	229480	52.63
F	1-1/4	2-1/2	140578	58.53	229491	73.13
G	1-1/4	2-1/2	140589	58.53	229502	73.13
H	1-1/4	2-1/2	140600	58.53	229513	73.13
I	1-1/4	2-1/2	140611	60.83	229524	76.07
J	1-1/4	2-1/2	140622	60.83	229535	76.07
K	1-1/4	2-1/2	140633	60.83	229546	76.07
L	1-1/4	2-1/2	140644	64.40	229557	80.50
M	1-1/4	2-1/2	140655	64.40	229568	80.50

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
N	1-1/4	2-1/2	140666	66.70	229579	83.37
O	1-3/8	3	140677	66.70	229590	83.37
P	1-3/8	3	140688	71.70	229601	89.63
Q	1-3/8	3	140699	79.53	229612	99.40
R	1-3/8	3	140710	79.53	229623	99.40
S	1-3/8	3	140721	87.00	229634	108.77
T	1-3/8	3	140732	87.00	229645	108.77
U	1-3/8	3	140743	96.50	229656	120.60
V	1-3/8	3	140754	96.50	229667	120.60
W	1-3/8	3	140765	106.70	229678	133.37
X	1-3/8	3	140776	118.07	229689	147.60
Y	1-3/8	3	140787	123.77	229700	154.70
Z	1-3/8	3	140798	129.47	229711	161.80

DIAMETER TOLERANCE +.0000, -.0005

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE STRAIGHT FLUTE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# Solid Carbide Drills



## STRAIGHT FLUTE - 140° SPLIT POINT



UNCOATED

ALUMINUM COATED

WIRE SIZES							WIRE SIZES						
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE	SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
1	1-1/4	2-1/2	140809	43.30	229722	54.13	31	3/4	2	141139	24.73	230052	30.97
2	1-1/4	2-1/2	140820	42.53	229733	53.17	32	3/4	2	141150	24.53	230063	30.67
3	1-1/8	2-1/2	140831	40.83	229744	51.03	33	3/4	2	141161	23.90	230074	29.90
4	1-1/8	2-1/2	140842	38.57	229755	48.20	34	3/4	2	141172	23.80	230085	29.77
5	1-1/8	2-1/2	140853	39.00	229766	48.73	35	3/4	2	141183	23.20	230096	29.00
6	1-1/8	2-1/2	140864	38.43	229777	48.03	36	5/8	2	141194	22.97	230107	28.70
7	1-1/8	2-1/2	140875	37.00	229788	46.27	37	5/8	2	141205	22.97	230118	28.70
8	1-1/8	2-1/2	140886	36.47	229799	45.57	38	5/8	2	141216	22.73	230129	28.40
9	1-1/8	2-1/2	140897	35.37	229810	44.20	39	5/8	2	141227	21.83	230140	27.30
10	1-1/8	2-1/2	140908	34.83	229821	43.57	40	5/8	2	141238	21.83	230151	27.30
11	1-1/8	2-1/2	140919	34.23	229832	42.77	41	5/8	2	141249	21.83	230162	27.30
12	1-1/8	2-1/2	140930	33.60	229843	42.00	42	1/2	1-1/2	141260	21.03	230173	26.27
13	7/8	2	140941	33.03	229854	41.27	43	1/2	1-1/2	141271	20.67	230184	25.83
14	7/8	2	140952	32.80	229865	41.03	44	1/2	1-1/2	141282	20.40	230195	25.50
15	7/8	2	140963	32.50	229876	40.60	45	1/2	1-1/2	141293	19.93	230206	24.93
16	7/8	2	140974	32.37	229887	40.47	46	1/2	1-1/2	141304	19.30	230217	24.13
17	7/8	2	140985	31.60	229898	39.50	47	1/2	1-1/2	141315	19.30	230228	24.13
18	7/8	2	140996	30.70	229909	38.37	48	7/16	1-1/2	141326	19.30	230239	24.13
19	7/8	2	141007	30.50	229920	38.13	49	7/16	1-1/2	141337	18.83	230250	23.53
20	7/8	2	141018	29.47	229931	36.83	50	7/16	1-1/2	141348	18.60	230261	23.23
21	7/8	2	141029	29.27	229942	36.60	51	7/16	1-1/2	141359	18.50	230272	23.10
22	7/8	2	141040	28.70	229953	35.90	52	7/16	1-1/2	141370	18.50	230283	23.10
23	7/8	2	141051	27.50	229964	34.37	53	13/32	1-1/2	141381	18.23	230294	22.80
24	7/8	2	141062	26.73	229975	33.43	54	13/32	1-1/2	141392	18.23	230305	22.80
25	7/8	2	141073	25.93	229986	32.43	55	13/32	1-1/2	141403	17.97	230316	22.47
26	7/8	2	141084	25.63	229997	32.03	56	3/8	1-1/2	141414	17.97	230327	22.47
27	7/8	2	141095	25.13	230008	31.43	57	3/8	1-1/2	141425	17.97	230338	22.47
28	3/4	2	141106	24.30	230019	30.33	58	3/8	1-1/2	141436	17.97	230349	22.47
29	3/4	2	141117	23.77	230030	29.70	59	3/8	1-1/2	141447	17.97	230360	22.47
30	3/4	2	141128	23.40	230041	29.27	60	3/8	1-1/2	141458	17.97	230371	22.47

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE      +.0000, -.0005



# Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0400	N60	.0400	1/4	1-1/2	4	157353	34.11
.0410	N59	.0410	3/8	1-1/2	4	157364	34.11
.0420	N58	.0420	3/8	1-1/2	4	157375	34.11
.0430	N57	.0430	3/8	1-1/2	4	157386	34.11
.0440		.0440	3/8	1-1/2	4	157397	36.04
.0450		.0450	3/8	1-1/2	4	157408	36.04
.0460		.0460	3/8	1-1/2	4	157419	36.04
.0465	N56	.0465	3/8	1-1/2	4	157430	34.11
.0469	3/64	.0469	3/8	1-1/2	4	157441	32.41
.0470		.0470	3/8	1-1/2	4	157452	36.04
.0480		.0480	3/8	1-1/2	4	157463	36.04
.0490		.0490	3/8	1-1/2	4	157474	36.04
.0500		.0500	3/8	1-1/2	4	157485	36.04
.0510		.0510	3/8	1-1/2	4	157496	36.04
.0520	N55	.0520	3/8	1-1/2	4	157507	34.11
.0530		.0530	3/8	1-1/2	4	157518	36.04
.0540		.0540	3/8	1-1/2	4	157529	36.04
.0550	N54	.0550	3/8	1-1/2	4	157540	34.11
.0560		.0560	3/8	1-1/2	4	157551	36.04
.0570		.0570	3/8	1-1/2	4	157562	36.04
.0580		.0580	3/8	1-1/2	4	157573	36.04
.0590		.0590	3/8	1-1/2	4	157584	36.04
.0591	1.5mm	.0591	3/8	1-1/2	4	157595	36.04
.0595	N53	.0595	3/8	1-1/2	4	157606	34.11
.0600		.0600	3/8	1-1/2	4	157617	36.04
.0605		.0605	3/8	1-1/2	4	157628	47.92
.0610		.0610	3/8	1-1/2	4	157639	36.04
.0615		.0615	3/8	1-1/2	4	157650	39.86
.0620		.0620	3/8	1-1/2	4	157661	36.04
.0625	1/16	.0625	3/8	1-1/2	4	157672	32.41
.0630		.0630	3/8	1-1/2	4	157683	36.04
.0635	N52	.0635	3/8	1-1/2	4	157694	34.11
.0640		.0640	3/8	1-1/2	4	157705	36.04
.0645		.0645	3/8	1-1/2	4	157716	47.92
.0650		.0650	3/8	1-1/2	4	157727	36.04
.0660		.0660	1/2	1-3/4	4	157738	36.04
.0670	N51	.0670	1/2	1-3/4	4	157749	34.11
.0680		.0680	1/2	1-3/4	4	157760	36.04
.0690		.0690	1/2	1-3/4	4	157771	36.04
.0700	N50	.0700	1/2	1-3/4	4	157782	34.11
.0710		.0710	1/2	1-3/4	4	157793	36.04
.0720		.0720	1/2	1-3/4	4	157804	36.04
.0730	N49	.0730	1/2	1-3/4	4	157815	34.11
.0740		.0740	1/2	1-3/4	4	157826	36.04
.0750		.0750	1/2	1-3/4	4	157837	36.04
.0760	N48	.0760	1/2	1-3/4	4	157848	34.11
.0770		.0770	1/2	1-3/4	4	157859	36.04
.0780		.0780	1/2	1-3/4	4	157870	36.04
.0781	5/64	.0781	1/2	1-3/4	4	157881	32.41
.0785	N47	.0785	1/2	1-3/4	4	157892	34.11
.0787	2mm	.0787	1/2	1-3/4	4	157903	36.04
.0790		.0790	1/2	1-3/4	4	157914	36.04
.0800		.0800	1/2	1-3/4	4	157925	36.04
.0810	N46	.0810	1/2	2	4	157936	34.11
.0820	N45	.0820	1/2	2	4	157947	34.11
.0830		.0830	1/2	2	4	157958	36.04

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0840		.0840	1/2	2	4	157969	36.04
.0850		.0850	1/2	2	4	157980	36.04
.0860	N44	.0860	1/2	2	4	157991	34.11
.0870		.0870	1/2	2	4	158002	36.04
.0880		.0880	1/2	2	4	158013	36.04
.0890	N43	.0890	1/2	2	4	158024	34.11
.0900		.0900	1/2	2	4	158035	36.04
.0910		.0910	1/2	2	4	158046	36.04
.0915		.0915	1/2	2	4	158057	47.54
.0920		.0920	1/2	2	4	158068	36.04
.0925		.0925	1/2	2	4	158079	39.86
.0930		.0930	1/2	2	4	158090	36.04
.0935	N42	.0935	1/2	2	4	158101	34.11
.0938	3/32	.0938	1/2	2	4	158112	32.41
.0940		.0940	1/2	2	4	158123	36.04
.0945		.0945	1/2	2	4	158134	39.86
.0950		.0950	1/2	2	4	158145	36.04
.0960	N41	.0960	5/8	2	4	158156	34.11
.0970		.0970	5/8	2	4	158167	36.04
.0980	N40	.0980	5/8	2	4	158178	34.11
.0984	2.5mm	.0984	5/8	2	4	158189	36.04
.0990		.0990	5/8	2-1/4	4	158200	36.04
.0995	N39	.0995	5/8	2-1/4	4	158211	34.11
.1000		.1000	5/8	2-1/4	4	158222	36.04
.1010		.1010	5/8	2-1/4	4	158233	36.04
.1015	N38	.1015	5/8	2-1/4	4	158244	34.11
.1020		.1020	5/8	2-1/4	4	158255	36.04
.1030		.1030	5/8	2-1/4	4	158266	36.04
.1040	N37	.1040	5/8	2-1/4	4	158277	34.11
.1050		.1050	5/8	2-1/4	4	158288	36.04
.1060		.1060	5/8	2-1/4	4	158299	36.04
.1065	N36	.1065	5/8	2-1/4	4	158310	34.11
.1070		.1070	5/8	2-1/4	4	158321	36.04
.1080		.1080	5/8	2-1/4	4	158332	36.04
.1090		.1090	5/8	2-1/4	4	158343	37.55
.1094	7/64	.1094	5/8	2-1/4	4	158354	32.41
.1100	N35	.1100	5/8	2-1/4	4	158365	34.11
.1110	N34	.1110	5/8	2-1/4	4	158376	34.11
.1120		.1120	5/8	2-1/4	4	158387	36.04
.1130	N33	.1130	5/8	2-1/4	4	158398	34.11
.1140		.1140	5/8	2-1/4	4	158409	36.04
.1150		.1150	5/8	2-1/4	4	158420	36.04
.1160	N32	.1160	5/8	2-1/4	4	158431	35.88
.1170		.1170	5/8	2-1/4	4	158442	38.16
.1180		.1180	5/8	2-1/4	4	158453	38.16
.1181	3mm	.1181	5/8	2-1/4	4	158464	35.08
.1190		.1190	5/8	2-1/4	4	158475	38.16
.1200	N31	.1200	5/8	2-1/4	4	158486	35.88
.1210		.1210	5/8	2-1/4	4	158497	38.16
.1220		.1220	5/8	2-1/4	4	158508	38.16
.1230		.1230	5/8	2-1/4	4	158519	38.16
.1235		.1235	5/8	2-1/4	4	158530	50.82
.1240		.1240	5/8	2-1/4	4	158541	38.16
.1245		.1245	5/8	2-1/4	4	158552	42.18
.1250	1/8	.1250	5/8	2-1/4	4	158563	34.50
.1255		.1255	5/8	2-1/4	4	158574	42.18

CONTINUED ON NEXT PAGE

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0003, -.0000	+ .0003, -.0002

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS  
**CARBIDE REAMERS**

# Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1260		.1260	5/8	2-1/4	4	158585	38.16
.1265		.1265	5/8	2-1/4	4	158596	50.82
.1270		.1270	5/8	2-1/4	4	158607	38.16
.1275		.1275	5/8	2-1/4	4	158618	50.82
.1280		.1280	5/8	2-1/4	4	158629	38.16
.1285	N30	.1285	5/8	2-1/4	4	158640	38.16
.1290		.1290	5/8	2-1/4	4	158651	38.16
.1300		.1300	5/8	2-1/2	4	158662	38.16
.1310		.1310	3/4	2-1/2	4	158673	43.68
.1320		.1320	3/4	2-1/2	4	158684	43.68
.1330		.1330	3/4	2-1/2	4	158695	43.68
.1340		.1340	3/4	2-1/2	4	158706	43.68
.1350		.1350	3/4	2-1/2	4	158717	43.68
.1360	N29	.1360	3/4	2-1/2	4	158728	40.86
.1370		.1370	3/4	2-1/2	4	158739	43.68
.1378	3.5mm	.1378	3/4	2-1/2	4	158750	43.68
.1380		.1380	3/4	2-1/2	4	158761	43.68
.1390		.1390	3/4	2-1/2	4	158772	43.68
.1400		.1400	3/4	2-1/2	4	158783	43.68
.1405	N28	.1405	3/4	2-1/2	4	158794	40.86
.1406	9/64	.1406	3/4	2-1/2	4	158805	39.32
.1410		.1410	3/4	2-1/2	4	158816	43.68
.1420		.1420	3/4	2-1/2	4	158827	43.68
.1430		.1430	3/4	2-1/2	4	158838	43.68
.1440	N27	.1440	3/4	2-1/2	4	158849	40.86
.1450		.1450	3/4	2-1/2	4	158860	43.68
.1460		.1460	3/4	2-1/2	4	158871	45.61
.1470	N26	.1470	3/4	2-1/2	4	158882	42.56
.1480		.1480	3/4	2-1/2	4	158893	45.61
.1490		.1490	3/4	2-1/2	4	158904	45.61
.1495	N25	.1495	3/4	2-1/2	4	158915	42.56
.1500		.1500	3/4	2-1/2	4	158926	45.61
.1510		.1510	3/4	2-1/2	4	158937	45.61
.1520	N24	.1520	3/4	2-1/2	4	158948	42.56
.1530		.1530	3/4	2-1/2	4	158959	45.61
.1540	N23	.1540	3/4	2-1/2	4	158970	42.56
.1545		.1545	3/4	2-1/2	4	158981	52.74
.1550		.1550	3/4	2-1/2	4	158992	45.61
.1555		.1555	3/4	2-1/2	4	159003	52.74
.1560		.1560	3/4	2-1/2	4	159014	45.61
.1562	5/32	.1562	3/4	2-1/2	4	159025	41.24
.1565		.1565	3/4	2-1/2	4	159036	52.74
.1570	N22	.1570	3/4	2-1/2	4	159047	42.56
.1575	4mm	.1575	3/4	2-1/2	4	159058	45.61
.1580		.1580	3/4	2-1/2	4	159069	45.61
.1590	N21	.1590	3/4	2-1/2	4	159080	42.56
.1600		.1600	3/4	2-1/2	4	159091	45.61
.1610	N20	.1610	7/8	2-1/2	4	159102	47.92
.1620		.1620	7/8	2-3/4	4	159113	51.36
.1630		.1630	7/8	2-3/4	4	159124	51.36
.1640		.1640	7/8	2-3/4	4	159135	51.36
.1650		.1650	7/8	2-3/4	4	159146	47.92
.1660	N19	.1660	7/8	2-3/4	4	159157	47.92
.1670		.1670	7/8	2-3/4	4	159168	51.36
.1680		.1680	7/8	2-3/4	4	159179	51.36
.1690		.1690	7/8	2-3/4	4	159190	51.36

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1695	N18	.1695	7/8	2-3/4	4	159201	47.92
.1700		.1700	7/8	2-3/4	4	159212	51.36
.1710		.1710	7/8	2-3/4	4	159223	51.36
.1719	11/64	.1719	7/8	2-3/4	4	159234	46.19
.1720		.1720	7/8	2-3/4	4	159245	51.36
.1730	N17	.1730	7/8	2-3/4	4	159256	47.92
.1740		.1740	7/8	2-3/4	4	159267	51.36
.1750		.1750	7/8	2-3/4	4	159278	51.36
.1760		.1760	7/8	2-3/4	4	159289	51.36
.1770	N16	.1770	7/8	2-3/4	4	159300	47.92
.1772	4.5mm	.1772	7/8	2-3/4	4	159311	53.48
.1780		.1780	7/8	2-3/4	4	159322	51.36
.1790		.1790	7/8	2-3/4	4	159333	51.36
.1800	N15	.1800	7/8	2-3/4	4	159344	47.92
.1810		.1810	7/8	2-3/4	4	159355	51.36
.1820	N14	.1820	7/8	2-3/4	4	159366	47.92
.1830		.1830	7/8	2-3/4	4	159377	51.36
.1840		.1840	7/8	2-3/4	4	159388	51.36
.1850	N13	.1850	7/8	2-3/4	4	159399	47.92
.1855		.1855	7/8	2-3/4	4	159410	61.74
.1860		.1860	7/8	2-3/4	4	159421	51.36
.1865		.1865	7/8	2-3/4	4	159432	55.22
.1870		.1870	7/8	2-3/4	4	159443	51.36
.1875	3/16	.1875	7/8	2-3/4	4	159454	46.19
.1880		.1880	7/8	2-3/4	4	159465	51.36
.1885		.1885	7/8	2-3/4	4	159476	55.22
.1890	N12	.1890	7/8	2-3/4	4	159487	47.92
.1900		.1900	7/8	2-3/4	4	159498	51.36
.1910	N11	.1910	7/8	2-3/4	4	159509	58.27
.1920		.1920	7/8	2-3/4	4	159520	62.32
.1930		.1930	7/8	2-3/4	4	159531	62.32
.1935	N10	.1935	7/8	2-3/4	4	159542	58.27
.1940		.1940	7/8	2-3/4	4	159553	62.32
.1950		.1950	7/8	2-3/4	4	159564	62.32
.1960	N9	.1960	1	3	4	159575	58.27
.1969	5mm	.1969	1	3	4	159586	62.32
.1970		.1970	1	3	4	159597	62.32
.1980		.1980	1	3	4	159608	62.32
.1990	N8	.1990	1	3	4	159619	58.27
.2000		.2000	1	3	4	159630	62.32
.2010	N7	.2010	1	3	4	159641	58.27
.2020		.2020	1	3	4	159652	62.32
.2030		.2030	1	3	4	159663	62.32
.2031	13/64	.2031	1	3	4	159674	55.96
.2040	N6	.2040	1	3	4	159685	58.27
.2050		.2050	1	3	4	159696	62.32
.2055	N5	.2055	1	3	4	159707	58.27
.2060		.2060	1	3	4	159718	62.32
.2070		.2070	1	3	4	159729	62.32
.2080		.2080	1	3	4	159740	62.32
.2090	N4	.2090	1	3	4	159751	58.27
.2100		.2100	1	3	4	159762	62.32
.2110		.2110	1	3	4	159773	62.32
.2120		.2120	1	3	4	159784	62.32
.2130	N3	.2130	1	3	4	159795	58.27
.2140		.2140	1	3	4	159806	62.32

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TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0003, -.0000	+ .0003, -.0002



# Solid Carbide Reamers



CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**CARBIDE REAMERS**

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2150		.2150	1	3	4	159817	62.32
.2160		.2160	1	3	4	159828	62.32
.2165	5.5mm	.2165	1	3	4	159839	65.75
.2170		.2170	1	3	4	159850	62.32
.2180		.2180	1	3	4	159861	62.32
.2188	7/32	.2188	1	3	4	159872	55.96
.2190		.2190	1	3	4	159883	62.32
.2200		.2200	1	3	4	159894	62.32
.2210	N2	.2210	1	3	4	159905	58.27
.2220		.2220	1	3	4	159916	62.32
.2230		.2230	1	3	4	159927	62.32
.2240		.2240	1	3	4	159938	62.32
.2250		.2250	1	3	4	159949	62.32
.2260		.2260	1	3	4	159960	68.45
.2270		.2270	1	3	4	159971	68.45
.2280	N1	.2280	1	3	4	159982	63.86
.2290		.2290	1	3	4	159993	63.86
.2300		.2300	1	3	4	160004	68.45
.2310		.2310	1	3	4	160015	68.45
.2320		.2320	1	3	4	160026	68.45
.2330		.2330	1	3	4	160037	68.45
.2340	A	.2340	1	3	4	160048	68.45
.2344	15/64	.2344	1	3	4	160059	61.54
.2350		.2350	1	3	4	160070	68.45
.2360		.2360	1	3	4	160081	68.45
.2362	6mm	.2362	1	3	4	160092	65.17
.2370		.2370	1	3	4	160103	68.45
.2380	B	.2380	1	3	4	160114	68.45
.2390		.2390	1	3	4	160125	68.45
.2400		.2400	1	3	4	160136	68.45
.2410		.2410	1	3	4	160147	68.45
.2420	C	.2420	1	3	4	160158	68.45
.2430		.2430	1	3	4	160169	68.45
.2440		.2440	1	3	4	160180	68.45
.2450		.2450	1	3	4	160191	68.45
.2460	D	.2460	1	3	4	160202	68.45
.2470		.2470	1	3	4	160213	68.45
.2480		.2480	1	3	4	160224	68.45
.2485		.2485	1	3	4	160235	76.48
.2490		.2490	1	3	4	160246	68.45
.2495		.2495	1	3	4	160257	72.66
.2500	1/4	.2500	1	3	4	160268	61.54
.2505		.2505	1	3	4	160279	72.66
.2510		.2510	1	3	4	160290	68.45
.2515		.2515	1	3	4	160301	85.12
.2520		.2520	1	3	4	160312	68.45
.2530		.2530	1	3	4	160323	68.45
.2540		.2540	1	3	4	160334	68.45
.2550		.2550	1	3	6	160345	68.45
.2559	6.5mm	.2559	1-1/8	3-1/4	6	160356	72.47
.2560		.2560	1-1/8	3-1/4	6	160367	82.81
.2570	F	.2570	1-1/8	3-1/4	6	160378	82.81
.2580		.2580	1-1/8	3-1/4	6	160389	82.81
.2590		.2590	1-1/8	3-1/4	6	160400	82.81
.2600		.2600	1-1/8	3-1/4	6	160411	82.81
.2610	G	.2610	1-1/8	3-1/4	6	160422	82.81

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2620		.2620	1-1/8	3-1/4	6	160433	82.81
.2630		.2630	1-1/8	3-1/4	6	160444	82.81
.2640		.2640	1-1/8	3-1/4	6	160455	82.81
.2650		.2650	1-1/8	3-1/4	6	160466	82.81
.2656	17/64	.2656	1-1/8	3-1/4	6	160477	74.59
.2660	H	.2660	1-1/8	3-1/4	6	160488	82.81
.2670		.2670	1-1/8	3-1/4	6	160499	82.81
.2680		.2680	1-1/8	3-1/4	6	160510	82.81
.2690		.2690	1-1/8	3-1/4	6	160521	82.81
.2700		.2700	1-1/8	3-1/4	6	160532	82.81
.2710		.2710	1-1/8	3-1/4	6	160543	82.81
.2720	I	.2720	1-1/8	3-1/4	6	160554	82.81
.2730		.2730	1-1/8	3-1/4	6	160565	82.81
.2740		.2740	1-1/8	3-1/4	6	160576	82.81
.2750		.2750	1-1/8	3-1/4	6	160587	82.81
.2756	7mm	.2756	1-1/8	3-1/4	6	160598	90.45
.2760		.2760	1-1/8	3-1/4	6	160609	82.81
.2770	J	.2770	1-1/8	3-1/4	6	160620	82.81
.2780		.2780	1-1/8	3-1/4	6	160631	82.81
.2790		.2790	1-1/8	3-1/4	6	160642	82.81
.2800		.2800	1-1/8	3-1/4	6	160653	82.81
.2810	K	.2810	1-1/8	3-1/4	6	160664	82.81
.2812	9/32	.2812	1-1/8	3-1/4	6	160675	74.59
.2820		.2820	1-1/8	3-1/4	6	160686	82.81
.2830		.2830	1-1/8	3-1/4	6	160697	82.81
.2840		.2840	1-1/8	3-1/4	6	160708	82.81
.2850		.2850	1-1/8	3-1/4	6	160719	82.81
.2860		.2860	1-1/8	3-1/4	6	160730	82.81
.2870		.2870	1-1/8	3-1/4	6	160741	82.81
.2880		.2880	1-1/8	3-1/4	6	160752	82.81
.2890		.2890	1-1/8	3-1/4	6	160763	82.81
.2900	L	.2900	1-1/8	3-1/4	6	160774	82.81
.2910		.2910	1-1/8	3-1/4	6	160785	82.81
.2920		.2920	1-1/8	3-1/4	6	160796	82.81
.2930		.2930	1-1/8	3-1/4	6	160807	82.81
.2940		.2940	1-1/8	3-1/4	6	160818	82.81
.2950	M	.2950	1-1/8	3-1/4	6	160829	82.81
.2953	7.5mm	.2953	1-1/8	3-1/4	6	160840	90.45
.2960		.2960	1-1/8	3-1/4	6	160851	82.81
.2969	19/64	.2969	1-1/8	3-1/4	6	160862	82.81
.2970		.2970	1-1/8	3-1/4	6	160873	82.81
.2980		.2980	1-1/8	3-1/4	6	160884	82.81
.2990		.2990	1-1/8	3-1/4	6	160895	82.81
.3000		.3000	1-1/8	3-1/4	6	160906	82.81
.3010		.3010	1-1/8	3-1/4	6	160917	82.81
.3020	N	.3020	1-1/8	3-1/4	6	160928	82.81
.3030		.3030	1-1/8	3-1/4	6	160939	82.81
.3040		.3040	1-1/8	3-1/4	6	160950	82.81
.3050		.3050	1-1/8	3-1/4	6	160961	82.81
.3060		.3060	1-1/8	3-1/4	6	160972	82.81
.3070		.3070	1-1/8	3-1/4	6	160983	82.81
.3080		.3080	1-1/8	3-1/4	6	160994	82.81
.3090		.3090	1-1/8	3-1/4	6	161005	82.81
.3100		.3100	1-1/8	3-1/4	6	161016	82.81
.3110		.3110	1-1/8	3-1/4	6	161027	82.81
.3115		.3115	1-1/8	3-1/4	6	161038	95.08

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TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0003, -.0000	+ .0003, -.0002

# Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3120		.3120	1-1/8	3-1/4	6	161049	82.81
.3125	5/16	.3125	1-1/8	3-1/4	6	161060	82.81
.3130		.3130	1-1/8	3-1/4	6	161071	82.81
.3135		.3135	1-1/8	3-1/4	6	161082	95.08
.3140		.3140	1-1/8	3-1/4	6	161093	82.81
.3150	8mm	.3150	1-1/8	3-1/4	6	161104	82.81
.3160	O	.3160	1-1/8	3-1/4	6	161115	92.61
.3170		.3170	1-1/8	3-1/4	6	161126	92.61
.3180		.3180	1-1/8	3-1/4	6	161137	92.61
.3190		.3190	1-1/8	3-1/4	6	161148	92.61
.3200		.3200	1-1/8	3-1/4	6	161159	92.61
.3210		.3210	1-1/4	3-1/2	6	161170	92.61
.3220		.3220	1-1/4	3-1/2	6	161181	92.61
.3230	P	.3230	1-1/4	3-1/2	6	161192	92.61
.3240		.3240	1-1/4	3-1/2	6	161203	92.61
.3250		.3250	1-1/4	3-1/2	6	161214	92.61
.3260		.3260	1-1/4	3-1/2	6	161225	92.61
.3270		.3270	1-1/4	3-1/2	6	161236	92.61
.3280		.3280	1-1/4	3-1/2	6	161247	92.61
.3281	21/64	.3281	1-1/4	3-1/2	6	161258	93.54
.3290		.3290	1-1/4	3-1/2	6	161269	92.61
.3300		.3300	1-1/4	3-1/2	6	161280	92.61
.3310		.3310	1-1/4	3-1/2	6	161291	92.61
.3320	Q	.3320	1-1/4	3-1/2	6	161302	92.61
.3330		.3330	1-1/4	3-1/2	6	161313	92.61
.3340		.3340	1-1/4	3-1/2	6	161324	92.61
.3346	8.5mm	.3346	1-1/4	3-1/2	6	161335	92.61
.3350		.3350	1-1/4	3-1/2	6	161346	92.61
.3360		.3360	1-1/4	3-1/2	6	161357	92.61
.3370		.3370	1-1/4	3-1/2	6	161368	92.61
.3380		.3380	1-1/4	3-1/2	6	161379	92.61
.3390	R	.3390	1-1/4	3-1/2	6	161390	93.22
.3400		.3400	1-1/4	3-1/2	6	161401	92.61
.3410		.3410	1-1/4	3-1/2	6	161412	92.61
.3420		.3420	1-1/4	3-1/2	6	161423	92.61
.3430		.3430	1-1/4	3-1/2	6	161434	92.61
.3438	11/32	.3438	1-1/4	3-1/2	6	161445	93.54
.3440		.3440	1-1/4	3-1/2	6	161456	92.61
.3450		.3450	1-1/4	3-1/2	6	161467	92.61
.3460		.3460	1-1/4	3-1/2	6	161478	92.61
.3470		.3470	1-1/4	3-1/2	6	161489	92.61
.3480	S	.3480	1-1/4	3-1/2	6	161500	92.61
.3490		.3490	1-1/4	3-1/2	6	161511	92.61
.3500		.3500	1-1/4	3-1/2	6	161522	92.61
.3510		.3510	1-1/4	3-1/2	6	161533	101.02
.3520		.3520	1-1/4	3-1/2	6	161544	101.02
.3530		.3530	1-1/4	3-1/2	6	161555	101.02
.3540		.3540	1-1/4	3-1/2	6	161566	101.02
.3543	9mm	.3543	1-1/4	3-1/2	6	161577	105.42
.3550		.3550	1-1/4	3-1/2	6	161588	101.02
.3560		.3560	1-1/4	3-1/2	6	161599	101.02
.3570		.3570	1-1/4	3-1/2	6	161610	101.02
.3580	T	.3580	1-1/4	3-1/2	6	161621	101.02
.3590		.3590	1-1/4	3-1/2	6	161632	102.76
.3594	23/64	.3594	1-1/4	3-1/2	6	161643	99.67
.3600		.3600	1-1/4	3-1/2	6	161654	101.02

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3610		.3610	1-1/4	3-1/2	6	161665	101.02
.3620		.3620	1-1/4	3-1/2	6	161676	101.02
.3630		.3630	1-1/4	3-1/2	6	161687	101.02
.3640		.3640	1-1/4	3-1/2	6	161698	101.02
.3650		.3650	1-1/4	3-1/2	6	161709	101.02
.3660		.3660	1-1/4	3-1/2	6	161720	101.02
.3670		.3670	1-1/4	3-1/2	6	161731	101.02
.3680	U	.3680	1-1/4	3-1/2	6	161742	101.02
.3690		.3690	1-1/4	3-1/2	6	161753	101.02
.3700		.3700	1-1/4	3-1/2	6	161764	101.02
.3710		.3710	1-1/4	3-1/2	6	161775	101.02
.3720		.3720	1-1/4	3-1/2	6	161786	101.02
.3730		.3730	1-1/4	3-1/2	6	161797	101.02
.3740	9.5mm	.3740	1-1/4	3-1/2	6	161808	84.35
.3745		.3745	1-1/4	3-1/2	6	161819	122.67
.3750	3/8	.3750	1-1/4	3-1/2	6	161830	99.67
.3755		.3755	1-1/4	3-1/2	6	161841	122.67
.3760		.3760	1-1/4	3-1/2	6	161852	126.88
.3765		.3765	1-1/4	3-1/2	6	161863	133.11
.3770	V	.3770	1-1/4	3-1/2	6	161874	126.88
.3780		.3780	1-1/4	3-1/2	6	161885	126.88
.3790		.3790	1-1/4	3-1/2	6	161896	126.88
.3800		.3800	1-1/4	3-1/2	6	161907	126.88
.3810		.3810	1-1/4	3-1/2	6	161918	126.88
.3820		.3820	1-1/4	3-1/2	6	161929	126.88
.3830		.3830	1-1/4	3-1/2	6	161940	126.88
.3840		.3840	1-1/4	3-1/2	6	161951	126.88
.3850		.3850	1-1/4	3-1/2	6	161962	126.88
.3860	W	.3860	1-1/4	3-1/2	6	161973	126.88
.3870		.3870	1-1/4	3-1/2	6	161984	157.39
.3880		.3880	1-1/4	3-1/2	6	161995	157.39
.3890		.3890	1-1/4	3-1/2	6	162006	157.39
.3900		.3900	1-1/4	3-1/2	6	162017	157.39
.3906	25/64	.3906	1-1/4	3-1/2	6	162028	114.26
.3910		.3910	1-1/4	3-1/2	6	162039	157.39
.3920		.3920	1-1/4	3-1/2	6	162050	157.39
.3930		.3930	1-1/4	3-1/2	6	162061	157.39
.3937	10mm	.3937	1-1/4	3-1/2	6	162072	119.23
.3940		.3940	1-1/4	3-1/2	6	162083	157.39
.3950		.3950	1-1/4	3-1/2	6	162094	157.39
.3960		.3960	1-1/4	3-1/2	6	162105	157.39
.3970	X	.3970	1-1/4	3-1/2	6	162116	157.39
.3980		.3980	1-1/4	3-1/2	6	162127	157.39
.3990		.3990	1-1/4	3-1/2	6	162138	157.39
.4000		.4000	1-1/4	3-1/2	6	162149	157.39
.4010		.4010	1-1/4	3-1/2	6	162160	157.39
.4020		.4020	1-1/4	3-1/2	6	162171	157.39
.4030		.4030	1-1/4	3-1/2	6	162182	157.39
.4040	Y	.4040	1-1/4	3-1/2	6	162193	157.39
.4050		.4050	1-1/4	3-1/2	6	162204	157.39
.4060		.4060	1-1/4	3-1/2	6	162215	157.39
.4062	13/32	.4062	1-1/4	3-1/2	6	162226	114.26
.4070		.4070	1-1/4	3-1/2	6	162237	157.39
.4080		.4080	1-1/4	3-1/2	6	162248	157.39
.4090		.4090	1-1/4	3-1/2	6	162259	157.39
.4100		.4100	1-1/4	3-1/2	6	162270	157.39

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TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0003, -.0000	+ .0003, -.0002



# Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4110		.4110	1-1/4	3-1/2	6	162281	157.39
.4120		.4120	1-1/4	3-1/2	6	162292	157.39
.4130	Z	.4130	1-1/4	3-1/2	6	162303	157.39
.4134	10.5mm	.4134	1-1/4	3-1/2	6	162314	143.36
.4140		.4140	1-1/4	3-1/2	6	162325	157.39
.4150		.4150	1-1/4	3-1/2	6	162336	157.39
.4160		.4160	1-3/8	4	6	162347	157.39
.4170		.4170	1-3/8	4	6	162358	157.39
.4180		.4180	1-3/8	4	6	162369	157.39
.4190		.4190	1-3/8	4	6	162380	157.39
.4200		.4200	1-3/8	4	6	162391	157.39
.4210		.4210	1-3/8	4	6	162402	157.39
.4219	27/64	.4219	1-3/8	4	6	162413	129.54
.4220		.4220	1-3/8	4	6	162424	157.39
.4230		.4230	1-3/8	4	6	162435	157.39
.4240		.4240	1-3/8	4	6	162446	157.39
.4250		.4250	1-3/8	4	6	162457	157.39
.4260		.4260	1-3/8	4	6	162468	157.39
.4270		.4270	1-3/8	4	6	162479	157.39
.4280		.4280	1-3/8	4	6	162490	157.39
.4290		.4290	1-3/8	4	6	162501	157.39
.4300		.4300	1-3/8	4	6	162512	157.39
.4310		.4310	1-3/8	4	6	162523	157.39
.4320		.4320	1-3/8	4	6	162534	157.39
.4330		.4330	1-3/8	4	6	162545	157.39
.4331	11mm	.4331	1-3/8	4	6	162556	143.36
.4340		.4340	1-3/8	4	6	162567	157.39
.4350		.4350	1-3/8	4	6	162578	157.39
.4360		.4360	1-3/8	4	6	162589	157.39
.4365		.4365	1-3/8	4	6	162600	157.39
.4370		.4370	1-3/8	4	6	162611	157.39
.4375	7/16	.4375	1-3/8	4	6	162622	129.54
.4380		.4380	1-3/8	4	6	162633	157.39
.4385		.4385	1-3/8	4	6	162644	188.07
.4390		.4390	1-3/8	4	6	162655	157.39
.4400		.4400	1-3/8	4	6	162666	157.39
.4410		.4410	1-3/8	4	6	162677	178.59
.4420		.4420	1-3/8	4	6	162688	178.59
.4430		.4430	1-3/8	4	6	162699	178.59
.4440		.4440	1-3/8	4	6	162710	178.59
.4450		.4450	1-3/8	4	6	162721	178.59
.4460		.4460	1-3/8	4	6	162732	178.59
.4470		.4470	1-3/8	4	6	162743	178.59
.4480		.4480	1-3/8	4	6	162754	178.59
.4490		.4490	1-3/8	4	6	162765	178.59
.4500		.4500	1-3/8	4	6	162776	178.59
.4510		.4510	1-3/8	4	6	162787	178.59
.4520		.4520	1-3/8	4	6	162798	178.59
.4528	11.5mm	.4528	1-3/8	4	6	162809	178.59
.4530		.4530	1-3/8	4	6	162820	163.69
.4531	29/64	.4531	1-3/8	4	6	162831	142.81
.4540		.4540	1-3/8	4	6	162842	178.59
.4550		.4550	1-3/8	4	6	162853	178.59

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4560		.4560	1-3/8	4	6	162864	178.59
.4570		.4570	1-3/8	4	6	162875	178.59
.4580		.4580	1-3/8	4	6	162886	178.59
.4590		.4590	1-3/8	4	6	162897	178.59
.4600		.4600	1-3/8	4	6	162908	178.59
.4610		.4610	1-3/8	4	6	162919	178.59
.4620		.4620	1-3/8	4	6	162930	178.59
.4630		.4630	1-3/8	4	6	162941	178.59
.4640		.4640	1-3/8	4	6	162952	178.59
.4650		.4650	1-3/8	4	6	162963	178.59
.4660		.4660	1-3/8	4	6	162974	178.59
.4670		.4670	1-3/8	4	6	162985	178.59
.4680		.4680	1-3/8	4	6	162996	178.59
.4688	15/32	.4688	1-3/8	4	6	163007	142.81
.4690		.4690	1-3/8	4	6	163018	188.20
.4700		.4700	1-3/8	4	6	163029	188.20
.4710		.4710	1-3/8	4	6	163040	188.20
.4720		.4720	1-3/8	4	6	163051	188.20
.4724	12mm	.4724	1-3/8	4	6	163062	181.32
.4730		.4730	1-3/8	4	6	163073	188.20
.4740		.4740	1-3/8	4	6	163084	188.20
.4750		.4750	1-3/8	4	6	163095	188.20
.4760		.4760	1-1/2	4	6	163106	188.20
.4770		.4770	1-1/2	4	6	163117	188.20
.4780		.4780	1-1/2	4	6	163128	188.20
.4790		.4790	1-1/2	4	6	163139	188.20
.4800		.4800	1-1/2	4	6	163150	188.20
.4810		.4810	1-1/2	4	6	163161	188.20
.4820		.4820	1-1/2	4	6	163172	188.20
.4830		.4830	1-1/2	4	6	163183	188.20
.4840		.4840	1-1/2	4	6	163194	188.20
.4844	31/64	.4844	1-1/2	4	6	163205	161.79
.4850		.4850	1-1/2	4	6	163216	188.20
.4860		.4860	1-1/2	4	6	163227	188.20
.4870		.4870	1-1/2	4	6	163238	226.94
.4880		.4880	1-1/2	4	6	163249	226.94
.4890		.4890	1-1/2	4	6	163260	226.94
.4900		.4900	1-1/2	4	6	163271	226.94
.4910		.4910	1-1/2	4	6	163282	226.94
.4920		.4920	1-1/2	4	6	163293	226.94
.4921	12.5mm	.4921	1-1/2	4	6	163304	226.94
.4930		.4930	1-1/2	4	6	163315	226.94
.4940		.4940	1-1/2	4	6	163326	226.94
.4950		.4950	1-1/2	4	6	163337	226.94
.4960		.4960	1-1/2	4	6	163348	226.94
.4970		.4970	1-1/2	4	6	163359	226.94
.4980		.4980	1-1/2	4	6	163370	226.94
.4990		.4990	1-1/2	4	6	163381	226.94
.4995		.4995	1-1/2	4	6	163392	226.94
.5000	1/2	.5000	1-1/2	4	6	163403	161.79
.5005		.5005	1-1/2	4	6	163414	226.94
.5010		.5010	1-1/2	4	6	163425	226.94
.5020		.5020	1-1/2	4	6	163436	226.94

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0003, -.0000	+ .0003, -.0002

CARBIDE REAMERS  
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# Solid Carbide Reamers



## 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 DIA.	FLUTE LENGTH	OVERALL LENGTH	1 PIECE	2 PIECES	3-5 PIECES	6-11 PIECES	12-17 PIECES	18-23 PIECES	24-35 PIECES	36-49 PIECES	50-74 PIECES
.0401 - .0450	0.037	3/8	1-1/2	218.26	144.39	125.92	80.59	63.81	57.08	53.72	50.36	47.01
.0451 - .0500	0.042	3/8	1-1/2	218.26	144.39	125.92	80.59	63.81	57.08	53.72	50.36	47.01
.0501 - .0570	0.046	3/8	1-1/2	219.93	146.06	127.59	82.26	65.48	58.76	55.40	52.05	48.69
.0571 - .0650	0.053	3/8	1-1/2	218.26	144.39	125.92	80.59	63.81	57.08	53.72	50.36	47.01
.0651 - .0800	0.060	1/2	1-3/4	219.93	146.06	127.59	82.26	65.48	58.76	55.40	52.05	48.69
.0801 - .0950	0.075	1/2	2	221.62	147.74	129.27	83.94	67.16	60.44	57.08	53.72	50.36
.0951 - .1150	0.090	5/8	2-1/4	224.96	151.09	132.63	87.30	70.50	63.81	60.44	57.08	53.72
.1151 - .1300	0.110	5/8	2-1/4	226.65	152.77	134.31	88.98	72.19	65.48	62.11	58.76	55.40
.1301 - .1450	0.125	3/4	2-1/2	231.68	157.81	139.35	94.02	77.24	70.50	67.16	63.81	60.44
.1451 - .1600	0.140	3/4	2-1/2	236.73	162.85	144.39	99.06	82.26	75.55	72.19	68.83	65.48
.1601 - .1750	0.155	7/8	2-3/4	241.75	167.89	149.41	104.08	87.30	80.59	77.24	73.87	70.50
.1751 - .1950	0.170	7/8	2-3/4	248.48	174.60	156.14	110.81	94.02	87.30	83.94	80.59	77.24
.1951 - .2100	0.188	1	3	261.90	188.04	169.57	124.24	107.45	100.73	97.38	94.02	90.66
.2101 - .2250	0.205	1	3	266.94	193.07	174.60	129.27	112.49	105.77	102.42	99.06	95.68
.2251 - .2400	0.220	1	3	275.33	201.47	183.00	137.67	120.89	114.16	110.81	107.45	104.08
.2401 - .2550	0.235	1	3	282.05	208.17	189.71	144.39	127.59	120.89	117.51	114.16	110.81
.2551 - .2750	0.250	1	3-1/4	298.84	224.96	206.49	161.18	144.39	137.67	134.31	130.95	127.59
.2751 - .2950	0.270	1-1/8	3-1/4	300.51	226.65	208.17	162.85	146.06	139.35	135.99	132.63	129.27
.2951 - .3150	0.290	1-1/8	3-1/4	317.30	243.43	224.96	179.64	162.85	156.14	152.77	149.41	146.06
.3151 - .3350	0.313	1-1/4	3-1/2	340.81	266.94	248.48	203.15	186.35	179.64	176.29	172.92	169.57
.3351 - .3550	0.330	1-1/4	3-1/2	344.16	273.66	251.83	206.49	189.71	183.00	179.64	176.29	172.92
.3551 - .3800	0.350	1-1/4	3-1/2	350.88	280.37	258.55	213.22	196.43	189.71	186.35	183.00	179.64
.3801 - .4100	0.375	1-1/4	4	376.06	302.20	283.72	238.40	221.62	214.89	211.54	208.17	204.82
.4101 - .4400	0.405	1-3/8	4	389.49	315.64	297.16	251.83	235.05	228.32	224.96	221.62	218.26
.4401 - .4700	0.438	1-3/8	4	409.64	335.78	317.30	271.98	255.18	248.48	245.12	241.75	238.40
.4701 - .5050	0.465	1-1/2	4	443.22	369.36	350.88	305.55	288.76	282.05	278.70	275.33	271.98
.5051 - .5400	0.500	1-1/2	4-1/2	486.87	413.01	394.54	349.21	332.42	325.69	322.34	318.99	315.64
.5401 - .5800	0.535	1-1/2	4-1/2	554.03	480.15	461.69	416.36	399.57	392.86	389.49	386.14	382.79
.5801 - .6260	0.575	1-3/4	4-1/2	607.76	533.88	515.41	470.08	453.30	446.58	443.22	439.86	436.50
.6261 - .6600	0.615	1-3/4	4-1/2	688.34	614.46	596.00	550.68	533.88	527.16	523.81	520.45	517.09
.6601 - .7050	0.655	2	5	789.07	715.20	696.73	651.40	634.62	627.89	624.54	621.19	617.82
.7051 - .7550	0.700	2	5	856.21	782.36	763.88	718.56	701.77	695.04	691.69	688.34	684.98
.7551 - .7950	0.750	2	5	923.37	849.51	831.03	785.71	768.92	762.21	758.84	755.49	752.13
.7951 - .8450	0.750	2-1/4	5	990.53	916.67	898.20	852.86	836.08	829.36	826.00	822.65	819.29
.8451 - .9000	0.750	2-1/4	5	1,124.84	1,050.99	1,032.51	987.18	970.40	963.66	960.31	956.96	953.61
.9001 - .9600	0.875	2-1/4	5	1,292.73	1,218.86	1,200.40	1,155.06	1,138.27	1,131.56	1,128.19	1,124.84	1,121.49
.9601 - 1.025	0.875	2-1/4	5	1,427.04	1,353.17	1,334.70	1,289.38	1,272.58	1,265.87	1,262.51	1,259.15	1,255.79

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

DIAMETER TOLERANCE +.0003, -.0000

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# Solid Carbide Burs

## SA - CYLINDRICAL



SA - CYLINDRICAL								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SA-41	1/16	1/8	3/16	1-1/2	122461	8.70	122131	8.70
SA-42	3/32	1/8	7/16	1-1/2	122483	8.70	122153	8.70
SA-43	1/8	1/8	9/16	1-1/2	122505	8.70	122175	8.70
SA-52	5/32	1/8	1/2	1-1/2	122527	29.06	122197	29.06
SA-53	3/16	1/8	1/2	1-1/2	122549	29.06	122219	29.06
SA-51	1/4	1/8	1/2	1-3/4	122571	12.91	122241	12.91
SA-11	1/8	1/4	1/2	2	122593	20.67	122263	20.67
SA-13	5/32	1/4	5/8	2	129171	23.94	128973	23.94
SA-14	3/16	1/4	5/8	2	122615	20.67	122285	20.67
SA-1	1/4	1/4	5/8	2	122637	14.64	122307	14.64
SA-2	5/16	1/4	3/4	2-1/2	122659	27.03	122329	27.03
SA-3	3/8	1/4	3/4	2-1/2	122681	18.12	122351	18.12
SA-4	7/16	1/4	1	2-3/4	122703	42.00	122373	42.00
SA-5	1/2	1/4	1	2-3/4	122725	28.91	122395	28.91
SA-6	5/8	1/4	1	2-3/4	122747	41.68	122417	41.68
SA-7	3/4	1/4	1	2-3/4	122769	64.99	122439	64.99
SA-9	1	1/4	1	2-3/4	129193	102.63	128995	102.63

## SA - CYLINDRICAL - EXTENDED SHANK LENGTHS

SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SA-1L6	1/4	1/4	1/2	6-3/4	127829	29.67	127763	29.67
SA-3L6	3/8	1/4	3/4	6-3/4	127851	41.79	127785	41.79
SA-5L6	1/2	1/4	1	7	127873	65.30	127807	65.30

## SA - CYLINDRICAL - FOR ALUMINUM

SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM#	LIST PRICE
SA-1NF	1/4	1/4	3/4	2	—	—	128423	21.18
SA-3NF	3/8	1/4	3/4	2-1/2	—	—	128445	29.61
SA-5NF	1/2	1/4	1	2-3/4	—	—	128467	49.45
SA-6NF	5/8	1/4	1	2-3/4	—	—	128489	73.50
SA-7NF	3/4	1/4	1	2-3/4	—	—	128511	96.57

## SB - CYLINDRICAL END CUT



TOP VIEW END CUT

SB - CYLINDRICAL END CUT								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SB-41	1/16	1/8	1/4	1-1/2	129259	11.73	122791	11.73
SB-42	3/32	1/8	7/16	1-1/2	129237	9.27	122813	9.27
SB-43	1/8	1/8	9/16	1-1/2	129215	8.48	122835	8.48
SB-51	1/4	1/8	3/16	1-7/16	123033	12.94	122857	12.94
SB-51	1/4	1/8	1/2	1-3/4	123055	14.09	122879	14.09
SB-11	1/8	1/4	1/2	2	123077	22.36	122901	22.36
SB-13	5/32	1/4	5/8	2	129281	27.00	129017	27.00
SB-14	3/16	1/4	5/8	2	123099	22.36	122923	22.36
SB-1	1/4	1/4	5/8	2	123121	17.36	122945	17.36
SB-2	5/16	1/4	3/4	2-1/2	123143	29.73	122967	29.73
SB-3	3/8	1/4	3/4	2-1/2	123165	20.73	122989	20.73
SB-4	7/16	1/4	1	2-3/4	123187	47.73	129039	47.73
SB-5	1/2	1/4	1	2-3/4	123209	31.82	123011	31.82
SB-6	5/8	1/4	1	2-3/4	123231	46.63	129369	46.63
SB-7	3/4	1/4	1	2-3/4	123253	71.61	129061	71.61
SB-9	1	1/4	1	2-3/4	129303	112.00	129083	112.00

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

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CARBIDE BURS

# Solid Carbide Burs



## SC - CYLINDRICAL BALL NOSE



SC - CYLINDRICAL BALL NOSE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SC-41	3/32	1/8	7/16	1-1/2	123583	8.70	123275	8.70
SC-42	1/8	1/8	9/16	1-1/2	123605	8.70	123297	8.70
SC-52	5/32	1/8	1/2	1-1/2	123627	29.06	123319	29.06
SC-53	3/16	1/8	1/2	1-1/2	123649	29.06	123341	29.06
SC-51	1/4	1/8	1/2	1-3/4	123671	12.94	123363	12.94
SC-11	1/8	1/4	1/2	2	123693	24.03	123385	24.03
SC-13	5/32	1/4	5/8	2	129325	27.48	129105	27.48
SC-14	3/16	1/4	5/8	2	123715	24.03	123407	24.03
SC-1	1/4	1/4	5/8	1-3/4	123737	17.39	123429	17.39
SC-2	5/16	1/4	3/4	2-1/2	123759	29.21	123451	29.21
SC-3	3/8	1/4	3/4	2-1/2	123781	21.03	123473	21.03
SC-4	7/16	1/4	1	2-3/4	123803	46.15	123495	46.15
SC-5	1/2	1/4	1	2-3/4	123825	32.61	123517	32.61
SC-6	5/8	1/4	1	2-3/4	123847	48.58	123539	48.58
SC-7	3/4	1/4	1	2-3/4	123869	70.01	123561	70.01
SC-9	1	1/4	1	2-3/4	129457	105.87	129435	105.87

SC - CYLINDRICAL BALL NOSE - EXTENDED SHANK LENGTHS								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SC-1L6	1/4	1/4	1/2	6-3/4	127961	34.55	127895	34.55
SC-3L6	3/8	1/4	3/4	6-3/4	127983	46.55	127917	46.55
SC-5L6	1/2	1/4	1	7	128005	73.24	127939	73.24

SC - CYLINDRICAL BALL NOSE - FOR ALUMINUM								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
SC-1NF	1/4	1/4	3/4	2	—	—	128533	20.85
SC-3NF	3/8	1/4	3/4	2-1/2	—	—	128555	27.79
SC-5NF	1/2	1/4	1	2-3/4	—	—	128577	39.39
SC-7NF	3/4	1/4	1	2-3/4	—	—	128599	95.48

## SE - EGG SHAPE



SE - EGG SHAPE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SE-41	1/8	1/8	7/32	1-1/2	125695	8.70	125519	8.70
SE-53	3/16	1/8	9/32	1-1/2	125717	29.06	125541	29.06
SE-51	1/4	1/8	3/8	1-5/8	125739	12.91	125563	12.91
SE-1	1/4	1/4	3/8	2	125761	20.67	125585	20.67
SE-3	3/8	1/4	5/8	2-3/8	125783	21.76	125607	21.76
SE-5	1/2	1/4	7/8	2-5/8	125805	30.42	125629	30.42
SE-6	5/8	1/4	1	2-3/4	125827	48.06	125651	48.06
SE-7	3/4	1/4	1	2-3/4	125849	67.22	125673	67.22

SE - EGG SHAPE - FOR ALUMINUM								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
SE-3NF	3/8	1/4	5/8	2-3/8	—	—	128731	28.85
SE-5NF	1/2	1/4	7/8	2-5/8	—	—	128753	50.21
SE-6NF	5/8	1/4	1	2-3/4	—	—	128775	71.13
SE-7NF	3/4	1/4	1	2-3/4	—	—	128797	101.79

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILL MILLS

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# Solid Carbide Burs

## SD - BALL SHAPE



SD - BALL SHAPE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SD-40	1/16	1/8	1/16	1-1/2	-	-	126267	11.73
SD-41	3/32	1/8	3/32	1-1/2	126531	8.70	126289	8.70
SD-42	1/8	1/8	1/8	1-1/2	126553	8.70	129127	8.70
SD-53	3/16	1/8	3/16	1-1/2	126575	29.06	-	-
SD-51	1/4	1/8	1/4	1-3/4	126597	12.91	126311	12.91
SD-11	1/8	1/4	1/8	2	126619	22.06	126333	22.06
SD-14	3/16	1/4	3/16	2	126641	22.06	126355	22.06
SD-1	1/4	1/4	1/4	2	126663	16.91	126377	16.91
SD-2	5/16	1/4	5/16	2-1/32	126685	23.76	126399	23.76
SD-3	3/8	1/4	3/8	2-5/64	126707	18.12	126421	18.12
SD-4	7/16	1/4	7/16	2-9/64	126729	30.67	126443	30.67
SD-5	1/2	1/4	1/2	2-13/64	126751	24.58	126465	24.58
SD-6	5/8	1/4	5/8	2-5/16	126773	38.26	126487	38.26
SD-7	3/4	1/4	3/4	2-7/16	126795	52.80	126509	52.80
SD-9	1	1/4	1	2-11/16	129347	112.00	129149	112.00

SD - BALL SHAPE - EXTENDED SHANK LENGTHS								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SD-1L6	1/4	1/4	1/4	6-1/4	128093	31.85	128027	31.85
SD-3L6	3/8	1/4	3/8	6-3/8	128115	38.30	128049	38.30
SD-5L6	1/2	1/4	1/2	6-1/2	128137	51.61	128071	51.61

SD - BALL SHAPE - FOR ALUMINUM								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	-	-	ALUMA CUT ITEM#	LIST PRICE
SD-1NF	1/4	1/4	1/4	2	-	-	128885	20.55
SD-3NF	3/8	1/4	3/8	2-1/2	-	-	128907	25.97
SD-5NF	1/2	1/4	1/2	2-13/64	-	-	128929	42.61
SD-6NF	5/8	1/4	5/8	2-5/16	-	-	128951	64.16

## SG - POINTED TREE



SG - POINTED TREE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	STANDARD CUT ITEM#	LIST PRICE
SG-41	1/8	1/8	1/4	1-1/2	124749	8.67	124463	8.67
SG-42	1/8	1/8	5/16	1-1/2	124771	8.67	124485	8.67
SG-43	1/8	1/8	3/8	1-1/2	124793	8.67	124507	8.67
SG-44	1/8	1/8	1/2	1-1/2	124815	12.06	124529	12.06
SG-53	3/16	1/8	1/2	1-1/2	124837	29.06	124551	29.06
SG-51	1/4	1/8	1/2	1-3/4	124859	12.91	124573	12.91
SG-1	1/4	1/4	5/8	2	124881	19.21	124595	19.21
SG-2	5/16	1/4	3/4	2-1/2	124903	30.45	124617	30.45
SG-3	3/8	1/4	3/4	2-1/2	124925	21.67	124639	21.67
SG-13	1/2	1/4	3/4	2-1/2	124947	45.94	124661	45.94
SG-5	1/2	1/4	1	2-3/4	124969	31.82	124683	31.82
SG-6	5/8	1/4	1	2-3/4	124991	49.35	124705	49.35
SG-7	3/4	1/4	1	2-3/4	125013	66.04	124727	66.04

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Solid Carbide Burs



## SF - ROUND NOSE TREE



SF - ROUND NOSE TREE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SF-41	1/8	1/8	1/4	1-1/2	124177	8.70	123891	8.70
SF-42	1/8	1/8	1/2	1-1/2	124199	8.70	123913	8.70
SF-53	3/16	1/8	1/2	1-1/2	124221	29.06	123935	29.06
SF-51	1/4	1/8	1/2	1-3/4	124243	12.91	123957	12.91
SF-1	1/4	1/4	3/4	2	124265	18.85	123979	18.85
SF-3	3/8	1/4	3/4	2-1/2	124287	21.03	124001	21.03
SF-4	7/16	1/4	1	2-3/4	124309	43.97	124023	43.97
SF-13	1/2	1/4	3/4	2-1/2	124331	46.82	124045	46.82
SF-5	1/2	1/4	1	2-3/4	124353	31.58	124067	31.58
SF-6	5/8	1/4	1	2-3/4	124375	48.33	124089	48.33
SF-7	3/4	1/4	1	2-3/4	124397	67.54	124111	67.54
SF-14	3/4	1/4	1-1/4	3	124419	122.98	124133	122.98
SF-15	3/4	1/4	1-1/2	3	124441	144.41	124155	144.41

SF - ROUND NOSE TREE - EXTENDED SHANK LENGTHS								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SF-1L6	1/4	1/4	5/8	6-3/4	128225	36.03	128159	36.03
SF-3L6	3/8	1/4	3/4	6-3/4	128247	45.64	128181	45.64
SF-5L6	1/2	1/4	1	7	128269	67.30	128203	67.30

SF - ROUND NOSE TREE - FOR ALUMINUM								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
SF-1NF	1/4	1/4	3/4	2	—	—	128621	21.24
SF-3NF	3/8	1/4	3/4	2-1/2	—	—	128643	28.09
SF-5NF	1/2	1/4	1	2-3/4	—	—	128665	49.70
SF-6NF	5/8	1/4	1	2-3/4	—	—	128687	75.83
SF-14NF	3/4	1/4	1-1/4	3	—	—	128709	92.24

## SH - FLAME SHAPE



SH - FLAME SHAPE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SH-41	1/8	1/8	1/4	1-1/2	126949	8.70	126817	8.70
SH-53	3/16	1/8	3/8	1-1/2	126971	29.06	126839	29.06
SH-1	1/4	1/4	5/8	2	129523	20.42	129501	20.42
SH-2	5/16	1/4	3/4	2-1/2	126993	23.55	126861	23.55
SH-5	1/2	1/4	1-1/4	3	127015	45.64	126883	45.64
SH-6	5/8	1/4	1-7/16	3-3/16	127037	107.58	126905	107.58
SH-7	3/4	1/4	1-5/8	3-3/8	127059	136.68	126927	136.68

CARBIDE BURS  
 CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Solid Carbide Burs

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
**CARBIDE BURS**  
 COUNTERSINKS  
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 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

## SJ - 60° INCLUDED ANGLE



SJ - 60° INCLUDED ANGLE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
<b>SJ-42</b>	1/8	1/8	3/32	1-1/2	<a href="#">127675</a>	8.70	<a href="#">127587</a>	8.70
<b>SJ-1</b>	1/4	1/4	3/16	2	<a href="#">127697</a>	16.91	<a href="#">127609</a>	16.91
<b>SJ-3</b>	3/8	1/4	5/16	2-3/16	<a href="#">127719</a>	20.73	<a href="#">127631</a>	20.73
<b>SJ-5</b>	1/2	1/4	7/16	2-19/64	<a href="#">127741</a>	28.42	<a href="#">127653</a>	28.42

## SK - 90° INCLUDED ANGLE



SK - 90° INCLUDED ANGLE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
<b>SK-42</b>	1/8	1/8	1/16	1-1/2	<a href="#">127499</a>	8.70	<a href="#">127411</a>	8.70
<b>SK-1</b>	1/4	1/4	1/8	2	<a href="#">127521</a>	16.91	<a href="#">127433</a>	16.91
<b>SK-3</b>	3/8	1/4	3/16	2-1/16	<a href="#">127543</a>	17.48	<a href="#">127455</a>	17.48
<b>SK-5</b>	1/2	1/4	1/4	2-1/8	<a href="#">127565</a>	27.39	<a href="#">127477</a>	27.39
<b>SK-7</b>	3/4	1/4	3/8	2-1/4	<a href="#">129413</a>	55.79	<a href="#">129391</a>	55.79

## SL - INCLUDED ANGLE WITH RADIUS END



SL - INCLUDED ANGLE WITH RADIUS END									
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
<b>SL-41</b>	1/8	1/8	3/8	1-1/2	8°	<a href="#">126069</a>	8.67	<a href="#">125871</a>	8.67
<b>SL-42</b>	1/8	1/8	1/2	1-1/2	8°	<a href="#">126091</a>	8.67	<a href="#">125893</a>	8.67
<b>SL-53</b>	3/16	1/8	1/2	1-1/2	14°	<a href="#">126113</a>	29.06	<a href="#">125915</a>	29.06
<b>SL-1</b>	1/4	1/4	5/8	2	14°	<a href="#">126135</a>	17.61	<a href="#">125937</a>	17.61
<b>SL-2</b>	5/16	1/4	7/8	2-3/4	14°	<a href="#">126157</a>	33.67	<a href="#">125959</a>	33.67
<b>SL-3</b>	3/8	1/4	1-1/16	2-15/16	14°	<a href="#">126179</a>	24.36	<a href="#">125981</a>	24.36
<b>SL-4</b>	1/2	1/4	1-1/4	3	14°	<a href="#">126201</a>	49.36	<a href="#">126003</a>	49.36
<b>SL-6</b>	5/8	1/4	1-5/16	3-3/16	14°	<a href="#">126223</a>	79.18	<a href="#">126025</a>	79.18
<b>SL-7</b>	3/4	1/4	1-1/2	3-3/8	14°	<a href="#">126245</a>	108.34	<a href="#">126047</a>	108.34

## SL - INCL. ANGLE WITH RAD. END - EXTENDED SHANK LENGTHS

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
<b>SL-1L6</b>	1/4	1/4	5/8	6-5/8	14°	<a href="#">128357</a>	36.91	<a href="#">128291</a>	36.91
<b>SL-3L6</b>	3/8	1/4	1-1/16	7-1/16	14°	<a href="#">128379</a>	58.15	<a href="#">128313</a>	58.15
<b>SL-4L6</b>	1/2	1/4	1-1/4	7-1/4	14°	<a href="#">128401</a>	71.24	<a href="#">128335</a>	71.24

## SL - INCL. ANGLE WITH RADIUS END - FOR ALUMINUM

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	—	—	ALUMA CUT ITEM #	LIST PRICE
<b>SL-4NF</b>	1/2	1/4	1-1/4	3	14°	—	—	<a href="#">128819</a>	49.82
<b>SL-6NF</b>	5/8	1/4	1-5/16	3-3/16	14°	—	—	<a href="#">128841</a>	100.33
<b>SL-7NF</b>	3/4	1/4	1-1/2	3-3/8	14°	—	—	<a href="#">128863</a>	124.62

# Solid Carbide Burs



## SM - POINTED CONE



SM - POINTED CONE								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SM-41	1/8	1/8	11/32	1-1/2	125277	8.70	125035	8.70
SM-42	1/8	1/8	7/16	1-1/2	125299	8.70	125057	8.70
SM-43	1/8	1/8	5/8	1-1/2	125321	8.70	125079	8.70
SM-53	3/16	1/8	1/2	1-1/2	125343	29.06	125101	29.06
SM-51	1/4	1/8	1/2	1-7/8	125365	12.91	125123	12.91
SM-1	1/4	1/4	1/2	2	125387	16.55	125145	16.55
SM-2	1/4	1/4	3/4	2	125409	25.64	125167	25.64
SM-3	1/4	1/4	1	2	125431	18.48	125189	18.48
SM-4	3/8	1/4	5/8	2-1/2	125453	24.64	125211	24.64
SM-5	1/2	1/4	7/8	2-3/4	125475	34.48	125233	34.48
SM-6	5/8	1/4	1	2-7/8	125497	77.89	125255	77.89

## SN - INVERTED TAPER



SN - INVERTED TAPER								
SIZE	DIAMETER	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	STANDARD CUT ITEM #	LIST PRICE
SN-41	3/32	1/8	3/16	1-1/2	-	-	127081	8.48
SN-42	1/8	1/8	3/16	1-1/2	127213	8.70	127103	8.70
SN-53	3/16	1/8	1/4	1-1/2	127235	29.06	127125	29.06
SN-51	1/4	1/8	1/4	1-1/2	127257	12.91	127147	12.91
SN-1	1/4	1/4	5/16	2	127279	16.82	127169	16.82
SN-4	1/2	1/4	1/2	2-1/4	127301	49.09	127191	49.09

## CARBIDE BUR SETS

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	128.12
SA-51, SB-51, SC-51, SD-51, SE-51, SF-51, SG-51, SM-51, SN-51	9 PCS.	1/4	1/8	WOOD	DOUBLE CUT	127345	137.76
SA-1, SC-1, SD-1, SE-1, SF-1, SG-1, SL-1, SM-2	8 PCS.	1/4	1/4	WOOD	DOUBLE CUT	127367	209.88
SA-5, SC-5, SD-5, SE-5, SF-5, SG-5, SL-4, SM-5	8 PCS.	1/2	1/4	WOOD	DOUBLE CUT	127389	376.61
SC-3, SD-3, SF-3, SG-3, SA-5, SC-5, SF-5, SL-4	8 PCS.	-	1/4	WOOD	DOUBLE CUT	129479	242.52
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	241.24

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Technical Information

## Micrograin Solid Carbide Endmills - Technical Information

All speed and feed recommendations should be considered only as a starting point. For extra long endmills the SFM should be reduced by 25%.

### GENERAL RECOMMENDATIONS

These suggested parameters (on the right) are recommended for uncoated tools only (except for the 6 flute 40° helix Altin coated tool). 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.

## SOLID CARBIDE ENDMILLS - SPEEDS & FEEDS

MATERIAL	SPEED SFM	FEEDRATE (INCHES/TOOTH) PER CUTTING TOOL DIAMETER				
		1/8	1/4	1/2	3/4	1
<b>NON FERROUS:</b>						
ALUMINUM/ALUMINUM ALLOY	1000 - 2000	.001	.002	.004	.006	.008
ALUMINUM/ALUMINUM ALLOY +10%	700 - 1200	.001	.002	.004	.006	.008
BRASS	300 - 450	.001	.002	.003	.004	.005
BRONZE	250 - 350	.001	.002	.003	.004	.005
COPPER/COPPER ALLOYS	500 - 900	.001	.002	.003	.005	.007
COMPOSITES:						
FIBERGLASS	200 - 600	.001	.002	.003	.004	.005
GRAPHITES	200 - 400	.001	.006	.01	.015	.02
GRAPHITE/EPOXY	200 - 400	.001	.002	.003	.004	.005
MAGNESIUM	1000 min.	.001	.002	.004	.006	.008
<b>STAINLESS STEEL:</b>						
FREE MACHINE	300 - 400	.0005	.001	.002	.004	.006
WORK HARDENING	150 - 300	.0005	.0005	.001	.003	.005
<b>HIGH TEMP ALLOYS:</b>						
NICKEL BASE	70 - 100	.0005	.001	.001	.0015	.002
<b>CAST IRON:</b>						
DUCTILE	250 - 400	.0005	.0015	.002	.004	.006
GRAY	350 - 500	.0005	.002	.004	.006	.008
MALLEABLE	200 - 350	.0005	.002	.004	.006	.008
<b>STEELS:</b>						
LOW ALLOY	350 - 600	.0005	.001	.002	.004	.006
MEDIUM ALLOY	200 - 400	.0005	.001	.002	.004	.006
HIGH ALLOY MOLD DIE	175 - 250	.0005	.001	.002	.004	.006
HIGH STRENGTH	75 - 150	.0005	.0005	.001	.003	.004
<b>TITANIUM:</b>						
SOFT	150 - 300	.0005	.001	.002	.004	.006
HARD	50 - 150	.0005	.0005	.001	.002	.004

## SOLID CARBIDE DRILLING - SPEEDS & FEEDS - CHIP LOAD

MATERIAL	Rc HARDNESS	25° Helix	15° Helix, Straight Fl	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"
<b>COBALT BASE ALLOYS:</b>								
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32	100 - 150	100 - 150	.0004"-.0010"	.0008"-.0020"	.0015"-.0025"	.0020"-.0040"	.0025"-.0050"
	OVER 32	80 - 110	80 - 110	.0004"-.0010"	.0005"-.0010"	.0010"-.0015"	.0010"-.0020"	.0015"-.0030"
<b>NICKEL BASE ALLOYS:</b>								
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32	125 - 150	125 - 175	.0005"-.0015"	.0010"-.0015"	.0015"-.0025"	.0020"-.0040"	.0025"-.0050"
	OVER 32	100 - 125	100 - 125	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>IRON BASE ALLOYS:</b>								
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32	150 - 200	175 - 200	.0010"-.0015"	.0010"-.0020"	.0015"-.0035"	.0020"-.0020"	.0030"-.0060"
	OVER 32	150 - 175	150 - 200	.0008"-.0015"	.0010"-.0020"	.0015"-.0025"	.0020"-.0040"	.0025"-.0050"
MONEL: MONEL-65% NICKEL	-	100 - 150	100 - 150	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>TITANIUM ALLOYS:</b>								
COMMERCIALLY PURE, 6AI-4V, ASTM 1/2/3, 6AI-25N-4Zr-2Mo-Si	-	150 - 200	150 - 200	.0008"-.0015"	.0010"-.0020"	.0015"-.0030"	.0020"-.0040"	.0025"-.0050"
<b>STAINLESS STEEL (PRECIPITATION):</b>								
12/8, 15/5, 17/4, AM-350/355	UNDER 32	125 - 175	150 - 200	.0005"-.0015"	.0010"-.0020"	.0015"-.0035"	.0020"-.0040"	.0025"-.0050"
	OVER 32	80 - 125	100 - 150	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC):</b>								
200 SERIES, 302, 303, 304, 316	UNDER 32	100 - 175	150 - 200	.0005"-.0015"	.0010"-.0020"	.0015"-.0035"	.0020"-.0040"	.0025"-.0050"
	OVER 32	100 - 125	125 - 150	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC):</b>								
304L, 316L	UNDER 32	80 - 100	90 - 125	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
	OVER 32	60 - 90	80 - 100	.0003"-.0008"	.0005"-.0010"	.0010"-.0015"	.0010"-.0020"	.0015"-.0030"
<b>STAINLESS STEEL (MARTENSITIC):</b>								
403, 410, 416, 440	UNDER 32	100 - 150	125 - 175	.0005"-.0015"	.0010"-.0020"	.0015"-.0035"	.0020"-.0040"	.0025"-.0050"
	OVER 32	80 - 125	100 - 140	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>HIGH STRENGTH TOOL STEELS:</b>								
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	UNDER 32	100 - 175	125 - 175	.0005"-.0015"	.0010"-.0020"	.0015"-.0025"	.0015"-.0035"	.0020"-.0040"
	OVER 32	80 - 130	80 - 130	.0004"-.0010"	.0010"-.0020"	.0010"-.0020"	.0015"-.0030"	.0020"-.0040"
<b>MEDIUM ALLOY STEELS:</b>								
200, 250, 300	UNDER 32	125 - 175	125 - 175	.0010"-.0015"	.0015"-.0025"	.0020"-.0030"	.0020"-.0040"	.0025"-.0050"
	OVER 32	100 - 150	100 - 150	.0005"-.0010"	.0010"-.0020"	.0010"-.0025"	.0015"-.0030"	.0020"-.0040"
<b>CARBON STEELS:</b>								
1000's, 1100's, 1300's	UNDER 32	125 - 175	150 - 200	.0010"-.0015"	.0015"-.0025"	.0020"-.0030"	.0020"-.0040"	.0025"-.0050"
	OVER 32	100 - 125	100 - 175	.0005"-.0010"	.0010"-.0020"	.0010"-.0020"	.0015"-.0035"	.0020"-.0040"
<b>DUCTILE: DUCTILE CAST IRONS</b>								
	-	125 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>CAST IRONS: GRAY CAST IRONS</b>								
	-	100 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>ALUMINUM: 2014, 2024, 6061-(T1-T6), 7075, DIE CAST, EXTRUDED</b>								
	-	150 - 300	-	.0010"-.0020"	.0015"-.0040"	.0020"-.0020"	.0030"-.0060"	.0035"-.0070"
<b>MAGNESIUM</b>								
	-	200 - 500	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>COPPER, COPPER ALLOYS</b>								
	-	150 - 300	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>BRASS BRONZE: BRASS, ALUM/BRONZE</b>								
	-	150 - 300	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>BRASS BRONZE: LOW SILICON BRONZE</b>								
	-	125 - 200	-	.0008"-.0015"	.0010"-.0020"	.0015"-.0030"	.0020"-.0040"	.0025"-.0050"
<b>COMPOSITES: G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS</b>								
	-	150 - 300	150 - 300	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"

TECHNICAL INFORMATION

CARBIDE ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADED MILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Technical Information



## THREADMILLS - SPEEDS & FEEDS AND FEEDRATE ADJUSTMENT

MATERIAL	SPEED SFM	FEEDRATE (INCHES/TOOTH) PER CUTTING TOOL DIAMETER						
		1/8	3/16	1/4	5/16	3/8	1/2	5/8
ALUMINUM	800 - 1400	.0005-.0010	.0010-.0015	.0015-.0025	.0020-.0030	.0030-.0045	.0035-.0055	.0050-.0070
MAGNESIUM	800 - 1400	.0005-.0010	.0010-.0015	.0015-.0025	.0020-.0030	.0030-.0045	.0035-.0055	.0050-.0070
BRASS	600 - 800	.0005-.0010	.0010-.0015	.0015-.0025	.0020-.0030	.0030-.0045	.0035-.0045	.0050-.0060
BRONZE	500 - 600	.0005-.0010	.0010-.0015	.0015-.0025	.0020-.0030	.0030-.0045	.0035-.0045	.0050-.0060
HARD BRONZE	200 - 300	.0004-.0008	.0007-.0012	.0010-.0020	.0010-.0020	.0015-.0025	.0020-.0030	.0030-.0040
LOW ALLOY STEEL<25RC	350 - 500	.0005-.0010	.0010-.0015	.0015-.0025	.0020-.0030	.0025-.0035	.0030-.0040	.0040-.0050
HIGH ALLOY STEEL>25RC	250 - 400	.0003-.0006	.0005-.0010	.0008-.0015	.0010-.0020	.0015-.0025	.0020-.0030	.0030-.0040
STAINLESS	150 - 250	.0004-.0008	.0006-.0010	.0010-.0015	.0015-.0020	.0015-.0030	.0020-.0035	.0030-.0040
CAST IRON - SOFT	250 - 350	.0004-.0008	.0007-.0013	.0007-.0013	.0015-.0020	.0020-.0030	.0020-.0040	.0030-.0050
CAST IRON - HARD	200 - 300	.0003-.0006	.0005-.0010	.0008-.0015	.0010-.0020	.0015-.0025	.0020-.0030	.0030-.0040
TITANIUM	80 - 150	.0003-.0006	.0005-.0010	.0008-.0015	.0010-.0020	.0015-.0025	.0015-.0025	.0025-.0035
INCONEL	60 - 100	.0003-.0006	.0005-.0010	.0008-.0015	.0010-.0020	.0015-.0025	.0015-.0025	.0020-.0030

## THREADMILLS - CALCULATION FORMULAS

TO CALCULATE	USE THIS FORMULA
FEEDRATE ADJUSTMENT	$\frac{(\text{THREAD MAJOR DIA. TO BE CUT}) - (\text{THREADMILL DIA.})}{(\text{THREAD MAJOR DIA. TO BE CUT})} \times \text{LINEAR FEEDRATE}$
RPM	$\frac{3.8}{(\text{THREADMILL DIAMETER})} \times \text{SFM}$
LINEAR IPM	$(\text{INCHES PER TOOTH}) \times (\text{NUMBER OF FLUTES}) \times \text{RPM}$

## Micrograin Solid Carbide Burs - Technical Information

### 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:

- Coarser flute results in improved cutting performance for Aluminum and Aluminum Alloys.

### SOLID CARBIDE BURS - SPEEDS & FEEDS

CUTTING DIAMETER	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

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Solid Carbide Countersinks

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
COUNTERSINKS  
CARBIDE BURS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



**SINGLE FLUTE**  
60° - 82° - 90° - 100°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	82° - ITEM#	90° - ITEM#	100° - ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	118842	118930	119018	216313	17.89
3/16	3/16	2	1	118853	118941	119029	216324	19.11
1/4	1/4	2	1	118864	118952	119040	216335	21.71
3/8	1/4	2-5/8	1	118875	118963	119051	216346	39.32
1/2	1/4	2-5/8	1	118886	118974	119062	216357	48.70
5/8	3/8	2-3/4	1	118897	118985	119073	216368	71.15
3/4	3/8	2-3/4	1	118908	118996	119084	216379	97.39
1	1/2	3	1	118919	119007	119095	216390	149.07



**THREE FLUTE**  
60° - 82° - 90° - 100°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	82° - ITEM#	90° - ITEM#	100° - ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	119106	119194	119282	216401	17.89
3/16	3/16	2	1	119117	119205	119293	216412	19.11
1/4	1/4	2	1	119128	119216	119304	216423	21.71
3/8	1/4	2-5/8	1	119139	119227	119315	216434	39.32
1/2	1/4	2-5/8	1	119150	119238	119326	216445	48.70
5/8	3/8	2-3/4	1	119161	119249	119337	216456	71.15
3/4	3/8	2-3/4	1	119172	119260	119348	216467	97.39
1	1/2	3	1	119183	119271	119359	216478	149.07



**SIX FLUTE - CHATTERLESS**  
60° - 82° - 90° - 100°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	82° - ITEM#	90° - ITEM#	100° - ITEM#	LIST PRICE
1/8	1/8	1-1/2	1	119480	119568	119656	216489	17.89
3/16	3/16	2	1	119491	119579	119667	216500	19.11
1/4	1/4	2	1	119502	119590	119678	216511	21.71
3/8	1/4	2-5/8	1	119513	119601	119689	216522	39.32
1/2	1/4	2-5/8	1	119524	119612	119700	216533	48.70
5/8	3/8	2-3/4	1	119535	119623	119711	216544	71.15
3/4	3/8	2-3/4	1	119546	119634	119722	216555	97.39
1	1/2	3	1	119557	119645	119733	216566	149.07

# Combined Drill & Countersinks



**SOLID CARBIDE - REGULAR - 60° UNCOATED**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	216302	26.18
0	1/32	1/8	1-1/2	1	216291	25.02
1	3/64	1/8	1-1/2	1	118776	22.77
2	5/64	3/16	2	1	118787	33.89
3	7/64	1/4	2	1	118798	38.22
4	1/8	5/16	2-1/8	1	118809	49.34
5	3/16	7/16	2-3/4	1	118820	78.22
6	7/32	1/2	3	1	118831	97.36



**SOLID CARBIDE - REGULAR - 60° ALTiN COATED**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	118833	32.70
0	1/32	1/8	1-1/2	1	118834	31.29
1	3/64	1/8	1-1/2	1	118835	28.46
2	5/64	3/16	2	1	118836	42.37
3	7/64	1/4	2	1	118837	47.76
4	1/8	5/16	2-1/8	1	118838	61.67
5	3/16	7/16	2-3/4	1	118839	97.78
6	7/32	1/2	3	1	118840	121.71



**HIGH SPEED STEEL - REGULAR - 60° UNCOATED**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
0	1/32	1/8	1-1/4	12	118666	9.15
1	3/64	1/8	1-1/4	12	118578	6.39
2	5/64	3/16	1-7/8	12	118589	6.75
3	7/64	1/4	2	12	118600	7.03
4	1/8	5/16	2-1/8	12	118611	7.36
5	3/16	7/16	2-3/4	12	118622	14.29
6	7/32	1/2	3	12	118633	21.84
7	1/4	5/8	3-1/4	6	118644	33.89
8	5/16	3/4	3-1/2	3	118655	47.92



**HIGH SPEED STEEL - REGULAR - 60° TIN COATED**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00	.025	1/8	1-1/4	12	119469	14.94
0	1/32	1/8	1-1/4	12	119458	14.94
1	3/64	1/8	1-1/4	12	119370	11.92
2	5/64	3/16	1-7/8	12	119381	12.24
3	7/64	1/4	2	12	119392	16.67
4	1/8	5/16	2-1/8	12	119403	17.18
5	3/16	7/16	2-3/4	12	119414	23.93
6	7/32	1/2	3	12	119425	38.19
7	1/4	5/8	3-1/4	6	119436	54.90
8	5/16	3/4	3-1/2	3	119447	88.33

**HIGH SPEED STEEL - MINIATURE - 60°**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00000	.010	1/8	1-1/4	12	118567	9.80
0000	.015	1/8	1-1/4	12	118556	8.93
000	.020	1/8	1-1/4	12	118545	8.54
00	.025	1/8	1-1/4	12	118534	8.54

**M42 COBALT - 60°**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	12	118732	16.90
2	5/64	3/16	1-7/8	12	118743	17.31
3	7/64	1/4	2	12	118754	18.05
4	1/8	5/16	2-1/8	12	118765	18.53

**HIGH SPEED STEEL - 90°**

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	12	118688	23.64
2	5/64	3/16	1-7/8	12	118699	24.32
3	7/64	1/4	2	12	118710	25.34
4	1/8	5/16	2-1/8	12	118721	26.02

**COMBINED DRILL & COUNTERSINK SET - 60°**

SIZE	SET ITEM#	LIST PRICE
#1 - #5 HSS - 60	118677	65.30

COUNTERSINKS  
CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



# Combined Drill & Countersinks

## COMBINED DRILL & COUNTERSINKS



HIGH SPEED STEEL - LONG LENGTH - 60°

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	ITEM#	LIST PRICE
1x3	3/64	1/8	1	119832	18.95
1x4	3/64	1/8	1	119843	19.63
1x5	3/64	1/8	1	119854	27.50
1x6	3/64	1/8	1	119865	35.82
2x3	5/64	3/16	1	119876	19.30
2x4	5/64	3/16	1	119887	22.10
2x5	5/64	3/16	1	119898	27.50
2x6	5/64	3/16	1	119909	36.07
3x3	7/64	1/4	1	119920	20.30
3x4	7/64	1/4	1	119931	21.52
3x5	7/64	1/4	1	119942	30.00
3x6	7/64	1/4	1	119953	36.49
4x4	1/8	5/16	1	119975	23.19

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	ITEM#	LIST PRICE
4x5	1/8	5/16	1	119986	32.35
4x6	1/8	5/16	1	119997	37.36
4-1/2x4	9/64	3/8	1	119964	27.78
4-1/2x5	9/64	3/8	1	120008	39.64
4-1/2x6	9/64	3/8	1	120052	44.30
5x4	3/16	7/16	1	120019	32.57
5x5	3/16	7/16	1	120030	37.58
5x6	3/16	7/16	1	120041	42.21
6x5	7/32	1/2	1	120063	40.09
6x6	7/32	1/2	1	120074	47.73
7x6	1/4	5/8	1	120085	93.60
8x6	5/16	3/4	1	120096	107.80
-	-	-	-	-	-

## COMBINED DRILL & COUNTERSINKS



HIGH SPEED STEEL - BELL TYPE - 60°

SIZE	DRILL DIAMETER	BODY DIAMETER	OVERALL LENGTH	PACKAGE QUANTITY	ITEM#	LIST PRICE
11	3/64	1/8	1-1/4	12	119744	8.87
12	1/16	3/16	1-7/8	12	119755	9.06
13	3/32	1/4	2	12	119766	9.28
14	7/64	5/16	2-1/8	12	119777	9.67
15	5/32	7/16	2-3/4	12	119788	15.45
16	3/16	1/2	3	12	119799	22.68
17	7/32	5/8	3-1/4	6	119810	43.68
18	1/4	3/4	3-1/2	3	119821	57.91

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# Countersinks



## FOUR-FLUTE MACHINE COUNTERSINKS



HIGH SPEED STEEL

60°

82°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	LIST PRICE
1/2	1/2	3-7/8	1	113573	68.19
5/8	1/2	4	1	113584	76.77
3/4	1/2	4-1/8	1	113595	97.97
7/8	1/2	4-1/4	1	113606	115.15
1	1/2	4-3/8	1	113617	119.01

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	82° - ITEM#	LIST PRICE
1/2	1/2	3-7/8	1	113628	68.19
5/8	1/2	4	1	113639	76.77
3/4	1/2	4-1/8	1	113650	97.97
7/8	1/2	4-1/4	1	113661	115.15
1	1/2	4-3/8	1	113672	119.01

## SINGLE-FLUTE COUNTERSINKS



HIGH SPEED STEEL

60°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	LIST PRICE
1/4 - 60	3/16	1-7/16	1	113408	21.36
3/8 - 60	1/4	1-21/32	1	113419	24.32
1/2 - 60	1/4	1-13/32	1	113430	31.09
3/4 - 60	1/2	1-27/32	1	113441	42.95
1 - 60	1/2	2-13/16	1	113452	66.72

82°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	82° - ITEM#	LIST PRICE
1/4 - 82	3/16	1-7/16	1	113463	21.36
3/8 - 82	1/4	1-21/32	1	113474	24.32
1/2 - 82	1/4	1-13/32	1	113485	31.09
3/4 - 82	1/2	1-27/32	1	113496	42.95
1 - 82	1/2	2-13/16	1	113507	66.72

90°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	90° - ITEM#	LIST PRICE
1/4 - 90	3/16	1-7/16	1	113518	21.36
3/8 - 90	1/4	1-21/32	1	113529	24.32
1/2 - 90	1/4	1-13/32	1	113540	31.09
3/4 - 90	1/2	1-27/32	1	113551	42.95
1 - 90	1/2	2-13/16	1	113562	66.72

COUNTERSINKS  
 CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Spiral Point Taps

## Predator

HIGH VANADIUM POWDERED METAL



SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIM	LIST PRICE
4 - 40	H2	2	1	213002	21.94	212793	25.24	213211	33.76
6 - 32	H3	2	1	213013	21.94	212804	25.24	213222	33.76
8 - 32	H3	3	1	213024	21.94	212815	25.24	213233	33.76
10 - 24	H3	3	1	213035	21.94	212826	25.24	213244	33.76
10 - 32	H3	3	1	213046	21.94	212837	25.24	213255	33.76
1/4 - 20	H3	3	1	213057	23.97	212848	27.58	213266	36.88
1/4 - 28	H3	3	1	213068	23.97	212859	27.58	213277	36.88
5/16 - 18	H3	3	1	213079	26.21	212870	30.15	213288	40.33
5/16 - 24	H3	3	1	213090	26.21	212881	30.15	213299	40.33
3/8 - 16	H3	3	1	213101	31.18	212892	35.85	213310	47.97
3/8 - 24	H3	3	1	213112	31.18	212903	35.85	213321	47.97
7/16 - 14	H3	4	1	213123	39.94	212914	45.91	213332	61.42
7/16 - 20	H3	4	1	213134	39.94	212925	45.91	213343	61.42
1/2 - 13	H3	4	1	213145	47.67	212936	54.82	213354	73.33
1/2 - 20	H3	4	1	213156	47.67	212947	54.82	213365	73.33
5/8 - 11	H3	4	1	213167	90.82	212958	104.45	213376	139.73
5/8 - 18	H3	4	1	213178	90.82	212969	104.45	213387	139.73
3/4 - 10	H3	4	1	213189	117.42	212980	135.03	213398	180.64
3/4 - 16	H3	4	1	213200	117.42	212991	135.03	213409	180.64

- **CNC STYLE**
- **FOR THROUGH HOLE TAPPING**
- **MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32**

HIGH PERFORMANCE - SPIRAL POINT TAPS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Spiral Point Taps



## Predator

HIGH VANADIUM POWDERED METAL  
METRIC



SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIM	LIST PRICE
M3 x 0.5	D3	2	1	214311	26.33	214388	30.30	214465	39.48
M4 x 0.7	D4	3	1	214322	26.33	214399	30.30	214476	39.48
M5 x 0.8	D4	3	1	214333	26.33	214410	30.30	214487	39.48
M6 x 1.0	D5	3	1	214344	28.94	214421	33.27	214498	43.39
M8 x 1.25	D5	3	1	214355	31.48	214432	36.21	214509	47.27
M10 x 1.5	D6	3	1	214366	37.39	214443	42.97	214520	55.64
M12 x 1.75	D6	3	1	214377	57.30	214454	65.88	214531	85.67
M14 x 2.0	D7	3	1	233858	87.36	233880	100.45	233902	117.85
M16 x 2.0	D7	3	1	233869	102.61	233891	118.00	233913	138.45

- **CNC STYLE**
- **FOR THROUGH HOLE TAPPING**
- **MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32**



ALL TOOLS ARE 100% MADE IN THE USA



# Spiral Flute Taps

## Predator

HIGH VANADIUM POWDERED METAL

37° HELIX - SEMI BOTTOMING  
2 - 2-1/2 THREAD CHAMFER



UNCOATED



STEAM OXIDE



ALTiN COATED

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTiN	LIST PRICE
4 - 40	H2	3	1	213420	33.94	213838	39.03	213629	52.18
6 - 32	H3	3	1	213431	33.94	213849	39.03	213640	52.18
8 - 32	H3	3	1	213442	33.94	213860	39.03	213651	52.18
10 - 24	H3	3	1	213453	33.94	213871	39.03	213662	52.18
10 - 32	H3	3	1	213464	33.94	213882	39.03	213673	52.18
1/4 - 20	H3	3	1	213475	34.97	213893	40.21	213684	53.79
1/4 - 28	H3	3	1	213486	34.97	213904	40.21	213695	53.79
5/16 - 18	H3	3	1	213497	38.30	213915	44.03	213706	58.91
5/16 - 24	H3	3	1	213508	38.30	213926	44.03	213717	58.91
3/8 - 16	H3	3	1	213519	45.36	213937	52.18	213728	69.82
3/8 - 24	H3	3	1	213530	45.36	213948	52.18	213739	69.82
7/16 - 14	H3	4	1	213541	57.39	213959	66.03	213750	88.30
7/16 - 20	H3	4	1	213552	57.39	213970	66.03	213761	88.30
1/2 - 13	H3	4	1	213563	68.06	213981	78.30	213772	104.73
1/2 - 20	H3	4	1	213574	68.06	213992	78.30	213783	104.73
5/8 - 11	H3	4	1	213585	130.03	214003	149.55	213794	200.06
5/8 - 18	H3	4	1	213596	130.03	214014	149.55	213805	200.06
3/4 - 10	H3	4	1	213607	151.97	214025	174.79	213816	233.85
3/4 - 16	H3	4	1	213618	151.97	214036	174.79	213827	233.85

- **CNC STYLE**
- **SUITED FOR BLIND HOLE TAPPING**
- **MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32**

HIGH PERFORMANCE - SPIRAL FLUTE TAPS

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# Spiral Flute Taps



## Predator

HIGH VANADIUM POWDERED METAL  
METRIC

37° HELIX - SEMI BOTTOMING  
2 - 2-1/2 THREAD CHAMFER



UNCOATED



STEAM OXIDE



ALTIN COATED

SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIN	LIST PRICE
M3 x 0.5	D3	2	1	214542	40.73	214619	46.82	214696	60.09
M4 x 0.7	D4	3	1	214553	40.73	214630	46.82	214707	60.09
M5 x 0.8	D4	3	1	214564	40.73	214641	46.82	214718	60.09
M6 x 1.0	D5	3	1	214575	41.94	214652	48.24	214729	62.30
M8 x 1.25	D5	3	1	214586	46.06	214663	52.97	214740	68.97
M10 x 1.5	D6	3	1	214597	54.45	214674	62.64	214751	81.21
M12 x 1.75	D6	3	1	214608	81.73	214685	93.97	214762	122.39
M14 x 2.0	D7	3	1	233924	115.82	233946	133.21	233968	156.36
M16 x 2.0	D7	3	1	233935	135.52	233957	155.85	233979	182.94

- **CNC STYLE**
- **SUITED FOR BLIND HOLE TAPPING**
- **MATERIALS: STEEL, STEEL ALLOYS, STAINLESS STEELS, TITANIUM ALLOYS, AND A VARIETY OF OTHER STEELS WITH A MAXIMUM OF RC 32**



ALL TOOLS ARE 100% MADE IN THE USA



# Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
0 - 80	H1	2	1	199483	199505	199527	15.15	199549	45.42
0 - 80	H2	2	1	-	199560	199571	15.15	-	-
1 - 64	H1	2	1	199582	199604	199626	14.09	199648	42.24
1 - 64	H2	2	1	-	199659	-	14.09	-	-
1 - 72	H1	2	1	199670	199681	199692	14.09	199703	42.24
1 - 72	H2	2	1	-	199714	199725	14.09	-	-
2 - 56	H1	3	1	199736	199747	199758	13.03	199769	39.06
2 - 56	H2	2	1	-	199780	199791	13.03	-	-
2 - 56	H2	3	1	199802	199824	199846	12.12	199868	36.36
2 - 64	H2	3	1	199879	199901	199923	13.03	199945	39.06
3 - 48	H1	3	1	-	199956	-	10.61	-	-
3 - 48	H2	2	1	-	199967	199978	10.61	-	-
3 - 48	H2	3	1	199989	200011	200033	9.33	200055	27.97
3 - 56	H2	3	1	200066	200077	200088	10.48	200099	31.42
4 - 40	H1	2	1	-	200110	-	8.58	-	-
4 - 40	H1	3	1	200121	200132	200143	8.24	200154	24.67
4 - 40	H2	2	1	-	200165	200176	8.24	-	-
4 - 40	H2	3	1	200187	200209	200242	7.67	200275	22.97
4 - 48	H1	3	1	-	200286	-	8.58	-	-
4 - 48	H2	3	1	200297	200319	200352	8.24	200385	24.67
4 - 36	H2	3	1	200396	200418	200451	8.24	200484	24.67
5 - 40	H1	3	1	-	200495	200506	8.24	-	-
5 - 40	H2	2	1	-	200517	200528	8.24	-	-
5 - 40	H2	3	1	200539	200561	200594	7.67	200627	22.97
5 - 44	H2	2	1	-	200638	-	8.24	-	-
5 - 44	H2	3	1	200649	200671	200704	8.24	200737	24.76
6 - 32	H1	2	1	-	200748	-	7.24	-	-
6 - 32	H1	3	1	200759	200770	200781	7.24	200792	21.70
6 - 32	H2	2	1	-	200803	200814	7.24	-	-
6 - 32	H2	3	1	200825	200847	200880	6.21	200913	18.70
6 - 32	H3	2	1	-	200924	200935	6.21	-	-
6 - 32	H3	3	1	200946	200957	200968	5.88	200979	17.61
6 - 32	H7	3	1	-	200990	201001	7.24	-	-
6 - 40	H1	3	1	-	201012	-	7.24	-	-
6 - 40	H2	2	1	-	201023	-	7.24	-	-
6 - 40	H2	3	1	201034	201056	201089	6.21	201122	18.70
8 - 32	H1	2	1	-	201133	-	7.24	-	-
8 - 32	H1	3	1	-	201144	201155	7.24	-	-
8 - 32	H1	4	1	201166	201177	201188	7.24	201199	21.70
8 - 32	H2	2	1	-	201210	201221	7.24	-	-
8 - 32	H2	3	1	-	201232	201243	7.24	-	-
8 - 32	H2	4	1	201254	201265	201276	6.21	201287	18.70
8 - 32	H3	2	1	-	201298	201309	6.21	-	-
8 - 32	H3	3	1	-	201320	201331	6.21	-	-
8 - 32	H3	4	1	201342	201364	201397	6.00	201430	18.03

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FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

HAND TAPS

# Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
8 - 32	H7	3	1	-	201441	201452	7.24	-	-
8 - 32	H7	4	1	-	201463	201474	7.24	-	-
8 - 36	H1	4	1	-	201485	-	7.24	-	-
8 - 36	H2	4	1	201496	201518	201551	6.21	201584	18.70
10 - 24	H1	3	1	-	201595	-	7.24	-	-
10 - 24	H1	4	1	201606	201617	201628	6.42	201639	19.24
10 - 24	H2	2	1	-	201650	201661	7.24	-	-
10 - 24	H2	3	1	-	201672	-	7.24	-	-
10 - 24	H2	4	1	201683	201694	201705	6.42	201716	19.24
10 - 24	H3	2	1	-	201727	201738	6.42	-	-
10 - 24	H3	3	1	-	201749	201760	6.42	-	-
10 - 24	H3	4	1	201771	201793	201826	6.21	201859	18.70
10 - 24	H7	3	1	-	201870	201881	7.24	-	-
10 - 24	H7	4	1	-	201892	201903	7.24	-	-
10 - 32	H1	2	1	-	201914	201925	7.24	-	-
10 - 32	H1	3	1	-	201936	-	7.24	-	-
10 - 32	H1	4	1	201947	201958	201969	6.42	201980	19.24
10 - 32	H2	2	1	-	201991	202002	7.24	-	-
10 - 32	H2	3	1	-	202013	202024	7.24	-	-
10 - 32	H2	4	1	202035	202046	202057	6.42	202068	19.24
10 - 32	H3	2	1	-	202079	202090	6.42	-	-
10 - 32	H3	3	1	-	202101	202112	6.42	-	-
10 - 32	H3	4	1	202123	202145	202178	6.21	202211	18.70
10 - 32	H7	3	1	-	202222	202233	7.24	-	-
10 - 32	H7	4	1	-	202244	202255	7.24	-	-
12 - 24	H3	4	1	202266	202288	202321	6.58	202354	19.73
12 - 28	H1	4	1	-	202365	-	7.64	-	-
12 - 28	H3	4	1	202376	202398	202431	7.24	202464	21.70
1/4 - 20	H1	3	1	-	202475	-	8.36	-	-
1/4 - 20	H1	4	1	202486	202497	202508	8.36	202519	25.09
1/4 - 20	H2	3	1	-	202530	-	8.36	-	-
1/4 - 20	H2	4	1	202541	202552	202563	7.97	202574	23.91
1/4 - 20	H3	2	1	-	202585	202596	8.36	-	-
1/4 - 20	H3	3	1	-	202607	202618	7.97	-	-
1/4 - 20	H3	4	1	202629	202651	202684	6.70	202717	20.09
1/4 - 20	H5	3	1	-	202728	202739	8.36	-	-
1/4 - 20	H5	4	1	-	202750	202761	7.97	-	-
1/4 - 28	H1	4	1	-	202772	202783	7.97	-	-
1/4 - 28	H2	4	1	-	202794	202805	8.36	-	-
1/4 - 28	H3	2	1	-	202816	202827	8.36	-	-
1/4 - 28	H3	3	1	-	202838	202849	8.36	-	-
1/4 - 28	H3	4	1	202860	202882	202915	6.70	202948	20.09
1/4 - 28	H4	4	1	-	202959	202970	8.36	-	-
5/16 - 18	H1	4	1	202981	202992	203003	9.27	-	-
5/16 - 18	H2	4	1	203014	203025	203036	9.27	203047	27.82

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FOR GENERAL DIMENSIONS SEE PAGE 124

MADE IN THE USA

HAND TAPS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
5/16 - 18	H3	2	1	-	203058	203069	10.42	-	-
5/16 - 18	H3	3	1	-	203080	203091	9.27	-	-
5/16 - 18	H3	4	1	203102	203124	203157	8.24	203190	24.73
5/16 - 18	H5	3	1	-	203201	203212	10.42	-	-
5/16 - 18	H5	4	1	-	203223	203234	9.27	-	-
5/16 - 24	H1	4	1	203245	203256	203267	9.27	-	-
5/16 - 24	H2	4	1	-	203278	203289	9.27	-	-
5/16 - 24	H3	3	1	-	203300	203311	9.27	-	-
5/16 - 24	H3	4	1	203322	203344	203377	8.24	203410	24.73
5/16 - 24	H4	4	1	-	203421	203432	9.27	-	-
3/8 - 16	H1	3	1	-	203443	-	11.88	-	-
3/8 - 16	H1	4	1	-	203454	203465	11.88	-	-
3/8 - 16	H2	4	1	203476	203487	203498	10.42	203509	31.30
3/8 - 16	H3	3	1	-	203520	203531	10.42	-	-
3/8 - 16	H3	4	1	203542	203564	203597	9.30	203630	27.91
3/8 - 16	H5	3	1	-	203641	203652	11.88	-	-
3/8 - 16	H5	4	1	-	203663	203674	10.42	-	-
3/8 - 24	H1	4	1	203685	203696	203707	11.88	-	-
3/8 - 24	H2	4	1	-	203718	203729	10.42	-	-
3/8 - 24	H3	3	1	-	203740	203751	11.88	-	-
3/8 - 24	H3	4	1	203762	203784	203817	9.30	203850	27.91
3/8 - 24	H4	4	1	-	203861	203872	10.42	-	-
7/16 - 14	H1	4	1	-	203883	203894	17.58	-	-
7/16 - 14	H2	4	1	-	203905	203916	17.58	-	-
7/16 - 14	H3	3	1	-	203927	-	17.58	-	-
7/16 - 14	H3	4	1	203938	203960	203993	16.00	204026	47.97
7/16 - 14	H5	4	1	-	204037	204048	17.58	-	-
7/16 - 20	H1	4	1	-	204059	204070	17.58	-	-
7/16 - 20	H2	4	1	-	204081	204092	17.58	-	-
7/16 - 20	H3	3	1	-	204103	-	17.58	-	-
7/16 - 20	H3	4	1	204114	204136	204169	16.00	204202	47.97
7/16 - 20	H5	4	1	-	204213	204224	17.58	-	-
1/2 - 13	H1	4	1	-	204235	204246	20.52	-	-
1/2 - 13	H2	4	1	-	204257	204268	20.52	-	-
1/2 - 13	H3	3	1	-	204279	204290	20.52	-	-
1/2 - 13	H3	4	1	204301	204323	204356	16.67	204389	50.03
1/2 - 13	H5	4	1	-	204400	204411	20.82	-	-
1/2 - 20	H1	4	1	204422	204433	204444	20.52	-	-
1/2 - 20	H2	4	1	-	204455	204466	20.52	-	-
1/2 - 20	H3	3	1	-	204477	-	20.52	-	-
1/2 - 20	H3	4	1	204488	204510	204543	18.85	204576	56.55
1/2 - 20	H5	4	1	-	204587	204598	20.52	-	-
9/16 - 12	H2	4	1	-	204609	-	30.48	-	-
9/16 - 12	H3	4	1	204620	204642	204675	27.97	204708	83.94
9/16 - 12	H5	4	1	-	204719	204730	30.48	-	-

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FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

HAND TAPS

# Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
9/16 - 18	H2	4	1	-	204741	-	30.48	-	-
9/16 - 18	H3	4	1	204752	204774	204807	27.97	204840	83.94
9/16 - 18	H5	4	1	-	204851	204862	30.48	-	-
5/8 - 11	H1	4	1	-	204873	-	38.61	-	-
5/8 - 11	H2	4	1	-	204884	-	38.61	-	-
5/8 - 11	H3	4	1	204895	204917	204950	33.58	204983	100.70
5/8 - 11	H5	4	1	-	204994	205005	38.61	-	-
5/8 - 18	H1	4	1	-	205016	-	38.61	-	-
5/8 - 18	H2	4	1	-	205027	205038	38.61	-	-
5/8 - 18	H3	4	1	205049	205071	205104	33.58	205137	100.70
5/8 - 18	H5	4	1	-	205148	205159	38.61	-	-
11/16 - 11	H3	4	1	205170	205192	205225	41.70	205258	125.09
11/16 - 16	H3	4	1	205269	205291	205324	41.70	205357	125.09
3/4 - 10	H1	4	1	-	205368	-	50.76	-	-
3/4 - 10	H2	4	1	-	205379	-	50.76	-	-
3/4 - 10	H3	4	1	205390	205412	205445	47.00	205478	140.91
3/4 - 10	H5	4	1	-	205489	205500	50.76	-	-
3/4 - 16	H1	4	1	-	205511	-	50.76	-	-
3/4 - 16	H2	4	1	-	205522	-	50.76	-	-
3/4 - 16	H3	4	1	205533	205555	205588	47.00	205621	140.91
3/4 - 16	H5	4	1	-	205632	205643	50.76	-	-
7/8 - 9	H2	4	1	-	205654	-	68.76	-	-
7/8 - 9	H4	4	1	205665	205687	205720	65.48	205753	196.45
7/8 - 9	H6	4	1	-	205764	-	68.76	-	-
7/8 - 14	H2	4	1	-	205775	-	68.76	-	-
7/8 - 14	H4	4	1	205786	205808	205841	65.48	205874	196.45
7/8 - 14	H6	4	1	-	205885	-	68.76	-	-
1 - 8	H2	4	1	-	205896	-	89.67	-	-
1 - 8	H4	4	1	205907	205929	205962	87.06	205995	261.21
1 - 8	H6	4	1	-	206006	-	89.67	-	-
1 - 12	H4	4	1	206017	206039	206072	87.06	206105	261.21
1 - 14	H2	4	1	-	206116	-	89.67	-	-
1 - 14	H4	4	1	206127	206149	206182	87.06	206215	261.21
1 - 14	H6	4	1	206226	206237	206248	89.67	-	-
1-1/8 - 7	H4	4	1	206259	206281	206314	140.91	206347	422.73
1-1/8 - 12	H4	4	1	206358	206380	206413	149.24	206446	447.73
1-1/4 - 7	H4	4	1	206457	206479	206512	184.97	206545	554.85
1-1/4 - 12	H4	6	1	206556	206578	206611	188.18	206644	564.55
1-3/8 - 6	H4	4	1	206655	206677	206710	232.39	206743	697.15
1-3/8 - 12	H4	6	1	206754	206776	206809	234.03	206842	702.06
1-1/2 - 6	H4	4	1	206853	206875	206908	268.36	206941	805.09
1-1/2 - 12	H4	6	1	206952	206974	207007	273.30	207040	819.88

HAND TAPS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

FOR GENERAL DIMENSIONS SEE PAGE 124

MADE IN THE USA



# Hand Taps

## STEAM OXIDE



## HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0 - 80	H1	2	1	199494	199516	199538	17.42
1 - 64	H1	2	1	199593	199615	199637	16.21
2 - 56	H2	3	1	199813	199835	199857	13.97
2 - 64	H2	3	1	199890	199912	199934	15.00
3 - 48	H2	3	1	200000	200022	200044	10.76
4 - 40	H2	3	1	200198	200231	200264	8.82
4 - 48	H2	3	1	200308	200341	200374	9.48
4 - 36	H2	3	1	200407	200440	200473	9.48
5 - 40	H2	3	1	200550	200583	200616	8.82
5 - 44	H2	3	1	200660	200693	200726	9.52
6 - 32	H2	3	1	200836	200869	200902	7.18
6 - 40	H2	3	1	201045	201078	201111	7.18
8 - 32	H3	4	1	201353	201386	201419	6.94
8 - 36	H2	4	1	201507	201540	201573	7.18
10 - 24	H3	4	1	201782	201815	201848	7.18
10 - 32	H3	4	1	202134	202167	202200	7.18
12 - 24	H3	4	1	202277	202310	202343	7.58
12 - 28	H3	4	1	202387	202420	202453	8.33
1/4 - 20	H3	4	1	202640	202673	202706	7.70
1/4 - 28	H3	4	1	202871	202904	202937	7.70
5/16 - 18	H3	4	1	203113	203146	203179	9.48
5/16 - 24	H3	4	1	203333	203366	203399	9.48
3/8 - 16	H3	4	1	203553	203586	203619	10.70
3/8 - 24	H3	4	1	203773	203806	203839	10.70
7/16 - 14	H3	4	1	203949	203982	204015	18.42
7/16 - 20	H3	4	1	204125	204158	204191	18.42
1/2 - 13	H3	4	1	204312	204345	204378	19.18
1/2 - 20	H3	4	1	204499	204532	204565	21.70
9/16 - 12	H3	4	1	204631	204664	204697	32.15
9/16 - 18	H3	4	1	204763	204796	204829	32.15
5/8 - 11	H3	4	1	204906	204939	204972	38.61
5/8 - 18	H3	4	1	205060	205093	205126	38.61
11/16 - 11	H3	4	1	205181	205214	205247	47.94
11/16 - 16	H3	4	1	205280	205313	205346	47.94
3/4 - 10	H3	4	1	205401	205434	205467	54.03
3/4 - 16	H3	4	1	205544	205577	205610	54.03
7/8 - 9	H4	4	1	205676	205709	205742	75.33
7/8 - 14	H4	4	1	205797	205830	205863	75.33
1 - 8	H4	4	1	205918	205951	205984	100.06
1 - 12	H4	4	1	206028	206061	206094	100.06
1 - 14	H4	4	1	206138	206171	206204	100.06
1-1/8 - 7	H4	4	1	206270	206303	206336	162.03
1-1/8 - 12	H4	4	1	206369	206402	206435	171.64
1-1/4 - 7	H4	4	1	206468	206501	206534	212.70
1-1/4 - 12	H4	6	1	206567	206600	206633	216.39
1-3/8 - 6	H4	4	1	206666	206699	206732	267.24
1-3/8 - 12	H4	6	1	206765	206798	206831	269.12
1-1/2 - 6	H4	4	1	206864	206897	206930	308.61
1-1/2 - 12	H4	6	1	206963	206996	207029	314.30

**STEAM OXIDE:** A BLACK OXIDE COATING 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).

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

HAND TAPS



# Hand Taps

## NITRIDE & STEAM OXIDE



### HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
4 - 40	H2	3	1	200220	200253	8.82
4 - 48	H2	3	1	200330	200363	9.48
4 - 36	H2	3	1	200429	200462	9.48
5 - 40	H2	3	1	200572	200605	8.82
5 - 44	H2	3	1	200682	200715	9.52
6 - 32	H2	3	1	200858	200891	7.18
6 - 40	H2	3	1	201067	201100	7.18
8 - 32	H3	4	1	201375	201408	6.94
8 - 36	H2	4	1	201529	201562	7.18
10 - 24	H3	4	1	201804	201837	7.18
10 - 32	H3	4	1	202156	202189	7.18
12 - 24	H3	4	1	202299	202332	7.58
12 - 28	H3	4	1	202409	202442	8.33
1/4 - 20	H3	4	1	202662	202695	7.70
1/4 - 28	H3	4	1	202893	202926	7.70
5/16 - 18	H3	4	1	203135	203168	9.48
5/16 - 24	H3	4	1	203355	203388	9.48
3/8 - 16	H3	4	1	203575	203608	10.70
3/8 - 24	H3	4	1	203795	203828	10.70
7/16 - 14	H3	4	1	203971	204004	18.42
7/16 - 20	H3	4	1	204147	204180	18.42
1/2 - 13	H3	4	1	204334	204367	19.18
1/2 - 20	H3	4	1	204521	204554	21.70
9/16 - 12	H3	4	1	204653	204686	32.15
9/16 - 18	H3	4	1	204785	204818	32.15
5/8 - 11	H3	4	1	204928	204961	38.61
5/8 - 18	H3	4	1	205082	205115	38.61
11/16 - 11	H3	4	1	205203	205236	47.94
11/16 - 16	H3	4	1	205302	205335	47.94
3/4 - 10	H3	4	1	205423	205456	54.03
3/4 - 16	H3	4	1	205566	205599	54.03
7/8 - 9	H4	4	1	205698	205731	75.33
7/8 - 14	H4	4	1	205819	205852	75.33
1 - 8	H4	4	1	205940	205973	100.06
1 - 12	H4	4	1	206050	206083	100.06
1 - 14	H4	4	1	206160	206193	100.06
1-1/8 - 7	H4	4	1	206292	206325	162.03
1-1/8 - 12	H4	4	1	206391	206424	171.64
1-1/4 - 7	H4	4	1	206490	206523	212.70
1-1/4 - 12	H4	6	1	206589	206622	216.39
1-3/8 - 6	H4	4	1	206688	206721	267.24
1-3/8 - 12	H4	6	1	206787	206820	269.12
1-1/2 - 6	H4	4	1	206886	206919	308.61
1-1/2 - 12	H4	6	1	206985	207018	314.30

**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).

FOR GENERAL DIMENSIONS SEE PAGE 124

**MADE IN THE USA**

HAND TAPS  
CARRIDE ENDMILLS  
CARRIDE MICRO ENDMILLS  
CARRIDE THREADMILLS  
CARRIDE DRILL MILLS  
CARRIDE DRILLS  
CARRIDE REAMERS  
CARRIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



# Hand Taps



**HIGH SPEED STEEL  
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
0 - 80	H1	2	1	240494	240505	240516	27.27	240527	81.84
2 - 56	H2	3	1	240538	240549	240560	21.84	240571	65.50
4 - 40	H2	3	1	240582	240593	240604	13.78	240615	41.37
5 - 40	H2	3	1	240626	240637	240648	13.78	240659	41.37
6 - 32	H3	3	1	240670	240681	240692	10.57	240703	31.70
8 - 32	H3	4	1	240714	240725	240736	10.82	240747	32.51
10 - 24	H3	4	1	240758	240769	240780	11.21	240791	33.70
10 - 32	H3	4	1	240802	240813	240824	11.21	240835	33.70
12 - 24	H3	4	1	240846	240857	240868	11.85	240879	35.53
12 - 28	H3	4	1	240890	240901	240912	13.04	240923	39.12
1/4 - 20	H3	4	1	240934	240945	240956	12.05	240967	36.20
1/4 - 28	H3	4	1	240978	240989	241000	12.05	241011	36.20
5/16 - 18	H3	4	1	241022	241033	241044	14.87	241055	44.58
5/16 - 24	H3	4	1	241066	241077	241088	14.87	241099	44.58
3/8 - 16	H3	4	1	241110	241121	241132	16.77	241143	50.27
3/8 - 24	H3	4	1	241154	241165	241176	16.77	241187	50.27
7/16 - 14	H3	4	1	241198	241209	241220	28.81	241231	86.47
7/16 - 20	H3	4	1	241242	241253	241264	28.81	241275	86.47
1/2 - 13	H3	4	1	241286	241297	241308	30.03	241319	90.13
1/2 - 20	H3	4	1	241330	241341	241352	33.95	241363	101.89
9/16 - 18	H3	4	1	254709	254720	254731	46.13	254742	138.54
5/8 - 11	H3	4	1	241374	241385	241396	60.52	241407	181.42
5/8 - 18	H3	4	1	241418	241429	241440	60.52	241451	181.42
3/4 - 10	H3	4	1	241462	241473	241484	84.67	241495	253.92
3/4 - 16	H3	4	1	241506	241517	241528	84.67	241539	253.92
1 - 8	H4	4	1	254753	254764	254775	143.68	254786	431.13

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

**HAND TAPS**

# Hand Taps



**HIGH SPEED STEEL  
METRIC  
UNCOATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	1	-	210791	-	20.24	-	-
M2 x 0.4	D3	3	1	210802	210813	210824	20.24	211594	60.70
M2.5 x 0.45	D3	3	1	-	210835	-	12.45	-	-
M3 x 0.5	D3	3	1	210846	210857	210868	10.36	211605	31.12
M3.5 x 0.6	D4	3	1	-	210879	-	8.58	-	-
M4 x 0.7	D4	4	1	210890	210901	210912	8.58	211616	25.73
M4.5 x 0.75	D4	4	1	-	210923	-	8.58	-	-
M5 x 0.8	D4	4	1	210934	210945	210956	8.58	211627	25.73
M6 x 1.0	D5	4	1	210967	210978	210989	9.06	211638	27.15
M7 x 1.0	D5	4	1	211000	211011	211022	9.06	211649	27.18
M8 x 1.25	D5	4	1	211033	211044	211055	9.06	211660	27.18
M10 x 1.25	D5	4	1	211066	211077	211088	18.61	211671	55.79
M10 x 1.50	D6	4	1	211099	211110	211121	18.61	211682	55.79
M12 x 1.25	D5	4	1	211132	211143	211154	21.82	211693	65.42
M12 x 1.75	D6	4	1	211165	211176	211187	21.82	211704	65.42
M14 x 1.5	D6	4	1	211198	211209	211220	32.61	211715	97.82
M14 x 2.0	D7	4	1	211231	211242	211253	32.61	211726	97.82
M16 x 1.5	D6	4	1	211264	211275	211286	39.73	211737	119.18
M16 x 2.0	D7	4	1	211297	211308	211319	39.73	211748	119.18
M18 x 1.5	D6	4	1	211330	211341	211352	53.52	211759	160.52
M18 x 2.5	D7	4	1	211363	211374	211385	53.52	211770	160.52
M20 x 2.5	D7	4	1	211396	211407	211418	69.21	211781	207.61
M24 x 3.0	D8	4	1	211429	211440	211451	101.27	211792	303.79
M27 x 3.0	D8	4	1	211462	211473	211484	175.03	211803	525.09
M30 x 3.5	D9	4	1	211495	211506	211517	223.55	211814	670.58
M33 x 3.5	D9	4	1	211528	211539	211550	222.94	211825	668.82
M36 x 4.0	D9	4	1	211561	211572	211583	282.73	211836	848.21

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HAND TAPS**

FOR GENERAL DIMENSIONS SEE PAGE 124



# Hand Taps



**HIGH SPEED STEEL  
METRIC  
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	1	-	243486	-	36.46	-	-
M2 x 0.4	D3	3	1	243497	243508	243519	36.46	244289	109.37
M2.5 x 0.45	D3	3	1	-	243530	-	22.42	-	-
M3 x 0.5	D3	3	1	243541	243552	243563	18.69	244300	56.12
M3.5 x 0.6	D4	3	1	-	243574	-	15.45	-	-
M4 x 0.7	D4	4	1	243585	243596	243607	15.45	244311	46.35
M4.5 x 0.75	D4	4	1	-	243618	-	15.45	-	-
M5 x 0.8	D4	4	1	243629	243640	243651	15.45	244322	46.35
M6 x 1.0	D5	4	1	243662	243673	243684	16.32	244333	48.92
M7 x 1.0	D5	4	1	243695	243706	243717	16.35	244344	48.95
M8 x 1.25	D5	4	1	243728	243739	243750	16.35	244355	48.95
M10 x 1.25	D5	4	1	243761	243772	243783	33.50	244366	100.54
M10 x 1.50	D6	4	1	243794	243805	243816	33.50	244377	100.54
M12 x 1.25	D5	4	1	243827	243838	243849	39.28	244388	117.88
M12 x 1.75	D6	4	1	243860	243871	243882	39.28	244399	117.88
M14 x 1.5	D6	4	1	243893	243904	243915	58.75	244410	176.25
M14 x 2.0	D7	4	1	243926	243937	243948	58.75	244421	176.25
M16 x 1.5	D6	4	1	243959	243970	243981	71.60	244432	214.79
M16 x 2.0	D7	4	1	243992	244003	244014	71.60	244443	214.79
M18 x 1.5	D6	4	1	244025	244036	244047	96.40	244454	289.22
M18 x 2.5	D7	4	1	244058	244069	244080	96.40	244465	289.22
M20 x 2.5	D7	4	1	244091	244102	244113	124.69	244476	374.12
M24 x 3.0	D8	4	1	244124	244135	244146	182.48	244487	547.44
M27 x 3.0	D8	4	1	244157	244168	244179	315.40	244498	946.23
M30 x 3.5	D9	4	1	244190	244201	244212	402.80	244509	1,208.40
M33 x 3.5	D9	4	1	244223	244234	244245	401.74	244520	1,205.22
M36 x 4.0	D9	4	1	244256	244267	244278	509.51	244531	1,528.49

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

HAND TAPS

# Spiral Point Plug Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H1	2	1	207161	18.67
0 - 80	H2	2	1	207172	18.67
1 - 64	H1	2	1	207194	16.85
1 - 64	H2	2	1	207205	16.85
1 - 72	H1	2	1	207227	16.85
1 - 72	H2	2	1	207238	16.85
2 - 56	H1	2	1	207260	16.03
2 - 56	H2	2	1	207271	14.30
2 - 64	H1	2	1	207293	16.03
2 - 64	H2	2	1	207304	16.03
3 - 48	H1	2	1	207326	11.48
3 - 48	H2	2	1	207337	11.48
3 - 56	H1	2	1	207359	14.06
3 - 56	H2	2	1	207370	12.79
4 - 40	H1	2	1	207392	10.48
4 - 40	H2	2	1	207403	9.21
4 - 48	H1	2	1	207436	10.67
4 - 48	H2	2	1	207447	10.48
4 - 36	H2	2	1	207480	10.48
5 - 40	H1	2	1	207513	10.48
5 - 40	H2	2	1	207524	9.21
5 - 44	H2	2	1	207557	10.48
6 - 32	H1	2	1	207590	9.21
6 - 32	H2	2	1	207601	7.76
6 - 32	H3	2	1	207612	7.76
6 - 32	H7	2	1	207645	8.79
6 - 40	H1	2	1	207656	8.79
6 - 40	H2	2	1	207667	8.79
8 - 32	H1	2	1	207700	8.79
8 - 32	H2	2	1	207711	7.76
8 - 32	H3	2	1	207722	7.76
8 - 32	H7	2	1	207755	8.79
8 - 36	H1	2	1	207766	8.79
8 - 36	H2	2	1	207777	8.79
10 - 24	H1	2	1	207810	9.61
10 - 24	H2	2	1	207821	8.79
10 - 24	H3	2	1	207832	7.76
10 - 24	H7	2	1	207865	9.61
10 - 32	H1	2	1	207876	8.79
10 - 32	H2	2	1	207887	7.76
10 - 32	H3	2	1	207898	7.76
10 - 32	H7	2	1	207931	9.61
12 - 24	H1	2	1	207942	8.79
12 - 24	H3	2	1	207953	8.79
12 - 28	H3	2	1	207986	8.79
1/4 - 20	H1	2	1	207997	8.79
1/4 - 20	H2	2	1	208008	8.79
1/4 - 20	H3	2	1	208019	7.76
1/4 - 20	H3	3	1	208052	9.61
1/4 - 20	H5	2	1	208063	8.76

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/4 - 20	H5	3	1	208074	9.61
1/4 - 28	H1	2	1	208085	9.61
1/4 - 28	H2	2	1	208096	8.76
1/4 - 28	H2	3	1	208107	9.61
1/4 - 28	H3	2	1	208118	7.76
1/4 - 28	H4	2	1	208151	9.61
1/4 - 28	H4	3	1	208162	9.61
5/16 - 18	H1	2	1	208173	11.06
5/16 - 18	H2	2	1	208184	9.61
5/16 - 18	H3	2	1	208195	8.36
5/16 - 18	H3	3	1	208228	11.06
5/16 - 18	H5	2	1	208239	9.61
5/16 - 18	H5	3	1	208250	11.06
5/16 - 24	H1	2	1	208261	11.06
5/16 - 24	H2	2	1	208272	11.06
5/16 - 24	H2	3	1	208283	11.06
5/16 - 24	H3	2	1	208294	8.36
5/16 - 24	H4	2	1	208327	11.06
5/16 - 24	H4	3	1	208338	11.06
3/8 - 16	H1	3	1	208349	12.39
3/8 - 16	H2	3	1	208360	11.52
3/8 - 16	H3	3	1	208371	9.91
3/8 - 16	H5	3	1	208404	12.48
3/8 - 24	H1	3	1	208415	12.58
3/8 - 24	H2	3	1	208426	12.58
3/8 - 24	H3	3	1	208437	10.67
3/8 - 24	H4	3	1	208470	12.58
7/16 - 14	H2	3	1	208481	18.39
7/16 - 14	H3	3	1	208492	16.85
7/16 - 14	H5	3	1	208525	18.39
7/16 - 20	H2	3	1	208536	18.39
7/16 - 20	H3	3	1	208547	16.85
7/16 - 20	H5	3	1	208580	18.39
1/2 - 13	H1	3	1	208591	22.52
1/2 - 13	H2	3	1	208602	22.52
1/2 - 13	H3	3	1	208613	17.18
1/2 - 13	H5	3	1	208646	20.27
1/2 - 20	H1	3	1	208657	22.52
1/2 - 20	H2	3	1	208668	22.52
1/2 - 20	H3	3	1	208679	20.18
1/2 - 20	H5	3	1	208712	22.52
9/16 - 12	H3	3	1	208723	28.06
9/16 - 18	H3	3	1	208756	28.06
5/8 - 11	H3	3	1	208789	38.30
5/8 - 11	H5	3	1	208822	38.30
3/4 - 10	H3	3	1	208833	38.30
3/4 - 10	H3	3	1	208866	54.03
3/4 - 10	H5	3	1	208899	54.03
3/4 - 16	H3	3	1	208910	54.03
-	-	-	-	-	-

FOR GENERAL DIMENSIONS SEE PAGE 124

MADE IN THE USA



# Spiral Point Plug Taps

## STEAM OXIDE



### HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H2	2	1	207183	21.48
1 - 64	H2	2	1	207216	19.42
1 - 72	H2	2	1	207249	19.42
2 - 56	H2	2	1	207282	16.48
2 - 64	H2	2	1	207315	18.45
3 - 48	H2	2	1	207348	13.21
3 - 56	H2	2	1	207381	14.73
4 - 40	H2	2	1	207425	10.61
4 - 48	H2	2	1	207469	12.09
4 - 36	H2	2	1	207502	12.09
5 - 40	H2	2	1	207546	10.61
5 - 44	H2	2	1	207579	12.09
6 - 32	H3	2	1	207634	8.91
6 - 40	H2	2	1	207689	10.12
8 - 32	H3	2	1	207744	8.91
8 - 36	H2	2	1	207799	10.12
10 - 24	H3	2	1	207854	8.91
10 - 32	H3	2	1	207920	8.91
12 - 24	H3	2	1	207975	10.12
1/4 - 20	H3	2	1	208041	8.91
1/4 - 28	H3	2	1	208140	8.91
5/16 - 18	H3	2	1	208217	9.64
5/16 - 24	H3	2	1	208316	9.64
3/8 - 16	H3	3	1	208393	11.42
3/8 - 24	H3	3	1	208459	12.27
7/16 - 14	H3	3	1	208514	19.42
7/16 - 20	H3	3	1	208569	19.42
1/2 - 13	H3	3	1	208635	19.79
1/2 - 20	H3	3	1	208701	23.21
9/16 - 12	H3	3	1	208745	32.27
9/16 - 18	H3	3	1	208778	32.27
5/8 - 11	H3	3	1	208811	44.06
5/8 - 18	H3	3	1	208855	44.06
3/4 - 10	H3	3	1	208888	62.15
3/4 - 16	H3	3	1	208932	62.15

## NITRIDE & STEAM OXIDE



### HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H2	2	1	207414	10.61
4 - 48	H2	2	1	207458	12.09
4 - 36	H2	2	1	207491	12.09
5 - 40	H2	2	1	207535	10.61
5 - 44	H2	2	1	207568	12.09
6 - 32	H3	2	1	207623	8.91
6 - 40	H2	2	1	207678	10.12
8 - 32	H3	2	1	207733	8.91
8 - 36	H2	2	1	207788	10.12
10 - 24	H3	2	1	207843	8.91
10 - 32	H3	2	1	207909	8.91
12 - 24	H3	2	1	207964	10.12
1/4 - 20	H3	2	1	208030	8.91
1/4 - 28	H3	2	1	208129	8.91
5/16 - 18	H3	2	1	208206	9.64
5/16 - 24	H3	2	1	208305	9.64
3/8 - 16	H3	3	1	208382	11.42
3/8 - 24	H3	3	1	208448	12.27
7/16 - 14	H3	3	1	208503	19.42
7/16 - 20	H3	3	1	208558	19.42
1/2 - 13	H3	3	1	208624	19.79
1/2 - 20	H3	3	1	208690	23.21
9/16 - 12	H3	3	1	208734	32.27
9/16 - 18	H3	3	1	208767	32.27
5/8 - 11	H3	3	1	208800	44.06
5/8 - 18	H3	3	1	208844	44.06
3/4 - 10	H3	3	1	208877	62.15
3/4 - 16	H3	3	1	208921	62.15

**STEAM OXIDE:** A BLACK OXIDE COATING 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).

**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).

FOR GENERAL DIMENSIONS SEE PAGE 124

CARRIBE ENDMILLS  
 CARRIBE MICRO ENDMILLS  
 CARRIBE THREADMILLS  
 CARRIBE DRILL MILLS  
 CARRIBE DRILLS  
 CARRIBE REAMERS  
 CARRIBE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

SPIRAL POINT PLUG TAPS

# Spiral Point Plug Taps



**HIGH SPEED STEEL  
TIN COATED**



**HIGH SPEED STEEL  
ALTIN COATED**

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0-80	H2	2	1	214773	27.62
2-56	H2	2	1	214784	22.16
4-40	H2	2	1	214795	15.68
5-40	H2	2	1	214806	15.68
6-32	H3	2	1	214817	14.65
8-32	H3	2	1	214828	14.65
10-24	H3	2	1	214839	14.65
10-32	H3	2	1	214850	14.65
12-24	H3	2	1	214861	16.00
12-28	H3	2	1	214872	16.00
1/4-20	H3	2	1	214883	14.65
1/4-28	H3	2	1	214894	14.65
5/16-18	H3	2	1	214905	16.03
5/16-24	H3	2	1	214916	16.03
3/8-16	H3	3	1	214927	18.82
3/8-24	H3	3	1	214938	19.79
7/16-14	H3	3	1	214949	31.13
7/16-20	H3	3	1	214960	31.13
1/2-13	H3	3	1	214971	31.54
1/2-20	H3	3	1	214982	35.24
5/8-11	H3	3	1	214993	72.92
5/8-18	H3	3	1	215004	72.92
3/4-10	H3	3	1	215015	95.21
3/4-16	H3	3	1	215026	95.21

**TIN COATED:** IT IS AN EXCELLENT MULTI-PURPOSE WEAR COATING WITH GOOD LUBRICITY.

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0-80	H2	2	1	214047	27.62
2-56	H2	2	1	214058	22.16
4-40	H2	2	1	214069	15.68
5-40	H2	2	1	214080	15.68
6-32	H3	2	1	214091	14.65
8-32	H3	2	1	214102	14.65
10-24	H3	2	1	214113	14.65
10-32	H3	2	1	214124	14.65
12-24	H3	2	1	214135	16.00
12-28	H3	2	1	214146	16.00
1/4-20	H3	2	1	214157	14.65
1/4-28	H3	2	1	214168	14.65
5/16-18	H3	2	1	214179	16.03
5/16-24	H3	2	1	214190	16.03
3/8-16	H3	3	1	214201	18.82
3/8-24	H3	3	1	214212	19.79
7/16-14	H3	3	1	214223	31.13
7/16-20	H3	3	1	214234	31.13
1/2-13	H3	3	1	214245	31.54
1/2-20	H3	3	1	214256	35.24
5/8-11	H3	3	1	214267	72.92
5/8-18	H3	3	1	214278	72.92
3/4-10	H3	3	1	214289	95.21
3/4-16	H3	3	1	214300	95.21

**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.

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**SPIRAL POINT PLUG TAPS**

FOR GENERAL DIMENSIONS SEE PAGE 124



# Spiral Point Plug Taps



**HIGH SPEED STEEL  
METRIC  
UNCOATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	211847	20.67
M2.5 x 0.45	D3	2	1	211858	14.82
M3 x 0.5	D3	2	1	211869	11.91
M3.5 x 0.6	D4	2	1	211880	10.27
M4 x 0.7	D4	2	1	211891	10.27
M4.5 x 0.75	D4	2	1	211902	10.27
M5 x 0.8	D4	2	1	211913	10.27
M6 x 1.0	D5	2	1	211924	10.27
M7 x 1.0	D5	2	1	211935	11.88
M8 x 1.25	D5	2	1	211946	11.88
M10 x 1.50	D6	3	1	211957	19.73
M12 x 1.75	D6	3	1	211968	24.70
M14 x 2.0	D7	3	1	211979	38.33
M16 x 2.0	D7	3	1	211990	43.42
M18 x 2.5	D7	3	1	212001	63.88
M20 x 2.5	D7	3	1	212012	84.30



**HIGH SPEED STEEL  
METRIC  
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	233220	28.49
M2.5 x 0.45	D3	2	1	233231	20.43
M3 x 0.5	D3	2	1	233242	16.45
M3.5 x 0.6	D4	2	1	233253	14.17
M4 x 0.7	D4	2	1	233264	14.17
M4.5 x 0.75	D4	2	1	233275	14.17
M5 x 0.8	D4	2	1	233286	14.17
M6 x 1.0	D5	2	1	233297	14.17
M7 x 1.0	D5	2	1	233308	16.35
M8 x 1.25	D5	2	1	233319	16.35
M10 x 1.50	D6	3	1	233330	27.17
M12 x 1.75	D6	3	1	233341	34.05
M14 x 2.0	D7	3	1	233352	52.81
M16 x 2.0	D7	3	1	233363	59.84
M18 x 2.5	D7	3	1	233374	88.01
M20 x 2.5	D7	3	1	233385	116.18

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

SPIRAL POINT PLUG TAPS

# Hi Spiral Flute Taps



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



### METRIC

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
3 - 48	H2	2	1	198504	31.54
3 - 56	H2	2	1	198515	31.54
4 - 40	H2	2	1	198526	25.95
4 - 48	H2	2	1	198537	25.95
5 - 40	H3	2	1	198548	25.95
5 - 44	H3	2	1	198559	25.95
6 - 32	H3	2	1	198570	21.07
6 - 40	H3	2	1	198581	21.07
8 - 32	H3	3	1	198592	21.07
8 - 36	H3	3	1	198603	21.07
10 - 24	H3	3	1	198614	21.07
10 - 32	H3	3	1	198625	21.07
12 - 24	H3	3	1	198636	22.87
12 - 28	H3	3	1	198647	22.87
1/4 - 20	H3	3	1	198658	22.87
1/4 - 28	H3	3	1	198669	22.87
5/16 - 18	H3	3	1	198680	28.17
5/16 - 24	H3	3	1	198691	28.17
3/8 - 16	H3	3	1	198702	32.51
3/8 - 24	H3	3	1	198713	32.51
7/16 - 14	H3	3	1	198724	48.73
7/16 - 20	H3	3	1	198735	48.73
1/2 - 13	H3	3	1	198746	58.65
1/2 - 20	H3	3	1	198757	58.65
9/16 - 12	H3	4	1	198768	97.84
9/16 - 18	H3	4	1	198779	97.84
5/8 - 11	H3	4	1	198790	127.68
5/8 - 18	H3	4	1	198801	127.68
3/4 - 10	H3	4	1	198812	163.43
3/4 - 16	H3	4	1	198823	163.43

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M3 x 0.5	D3	2	1	198834	26.69
M3.5 x 0.6	D4	3	1	198845	21.62
M4 x 0.7	D4	3	1	198856	21.62
M4.5 x 0.75	D4	3	1	198867	21.62
M5 x 0.8	D4	3	1	198878	21.62
M6 x 1.0	D5	3	1	198889	23.61
M8 x 1.25	D5	3	1	198900	29.10
M10 x 1.5	D6	3	1	198911	50.30
M12 x 1.75	D6	3	1	198922	60.55

- 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

FOR GENERAL DIMENSIONS SEE PAGE 124

**MADE IN THE USA**

HI SPIRAL FLUTE TAPS  
 COUNTERSINKS  
 HSS & COBALT REAMERS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT DRILLS  
 CARBIDE BURS  
 CARBIDE REAMERS  
 CARBIDE DRILLS  
 CARBIDE DRILL MILLS  
 CARBIDE THREADMILLS  
 CARBIDE ENDMILLS  
 CARBIDE ENDMILLS



# Thread Forming Taps

## PLUG & BOTTOMING HIGH SPEED STEEL



TIN COATED



METRIC  
TIN COATED

SIZE	H LIMIT	# OF LUBE GROOVES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0 - 80	H2	1	1	-	209669	28.56
0 - 80	H3	1	1	-	209680	28.56
1 - 64	H2	1	1	-	209691	28.56
1 - 72	H2	1	1	-	209702	28.56
2 - 56	H2	1	1	-	209713	28.36
2 - 56	H3	1	1	-	209724	28.36
2 - 64	H2	1	1	-	209735	28.36
2 - 64	H3	1	1	-	209746	28.36
3 - 48	H2	1	1	-	209757	28.36
3 - 48	H3	1	1	-	209768	28.36
3 - 56	H2	1	1	-	209779	28.36
3 - 56	H3	1	1	-	209790	28.36
4 - 40	H3	1	1	209801	209812	25.57
4 - 40	H5	1	1	209823	209834	25.57
4 - 48	H3	1	1	209845	209856	25.57
4 - 48	H5	1	1	209867	209878	25.57
5 - 40	H3	1	1	209889	209900	25.57
5 - 40	H5	1	1	209911	209922	25.57
5 - 44	H3	1	1	209933	209944	25.57
5 - 44	H5	1	1	209955	209966	25.57
6 - 32	H3	1	1	209977	209988	21.07
6 - 32	H5	1	1	209999	210010	21.07
6 - 32	H7	1	1	210021	210032	21.07
6 - 40	H3	1	1	210043	210054	21.07
6 - 40	H5	1	1	210065	210076	21.07
8 - 32	H3	1	1	210087	210098	21.07
8 - 32	H5	1	1	210109	210120	21.07
8 - 32	H7	1	1	210131	210142	21.07
8 - 36	H3	1	1	210153	210164	21.07
10 - 24	H4	1	1	210175	210186	20.27
10 - 24	H6	1	1	210197	210208	20.27
10 - 32	H4	1	1	210219	210230	20.27
10 - 32	H6	1	1	210241	210252	20.27
12 - 24	H4	2	1	210263	210274	20.27
12 - 24	H6	2	1	210285	210296	20.27
12 - 28	H4	2	1	210307	210318	20.27
1/4 - 20	H3	2	1	210329	210340	21.52
1/4 - 20	H4	2	1	210351	210362	21.52
1/4 - 20	H6	2	1	210373	210384	21.52
1/4 - 28	H4	2	1	210395	210406	21.52
1/4 - 28	H6	2	1	210417	210428	21.52
5/16 - 18	H5	2	1	210439	210450	23.90
5/16 - 18	H7	2	1	210461	210472	23.90
5/16 - 24	H5	2	1	210483	210494	23.90
5/16 - 24	H7	2	1	210505	210516	23.90
3/8 - 16	H5	2	1	210527	210538	23.90
3/8 - 16	H7	2	1	210549	210560	27.27
3/8 - 24	H5	2	1	210571	210582	27.27
3/8 - 24	H7	2	1	210593	210604	27.27
7/16 - 14	H5	2	1	210615	210626	41.50
7/16 - 14	H8	2	1	210637	210648	41.50
7/16 - 20	H5	2	1	210659	210670	41.50
7/16 - 20	H8	2	1	210681	210692	41.50
1/2 - 13	H5	2	1	210703	210714	46.42
1/2 - 13	H8	2	1	210725	210736	46.42
1/2 - 20	H5	2	1	210747	210758	46.42
1/2 - 20	H8	2	1	210769	210780	46.42

SIZE	D LIMIT	# OF LUBE GROOVES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
M3 x 0.5	D5	1	1	199329	199340	21.20
M4 x 0.7	D6	1	1	199351	199362	21.20
M5 x 0.8	D7	1	1	199373	199384	21.20
M6 x 1.0	D8	2	1	199395	199406	22.48
M8 x 1.25	D9	2	1	199417	199428	25.73
M10 x 1.5	D10	2	1	199439	199450	28.94
M12 x 1.75	D11	2	1	199461	199472	49.95

- **THREAD FORMING TAPS HAVE NO FLUTES OR CUTTING EDGES AND PROVIDE CHIP-LESS TAPPING**
- **"LUBE GROOVES" FOR LUBRICATION AND VENTING IN BLIND HOLES**
- **PLUG STYLE - 4 THREADS TAPERED, REQUIRES LESS TORQUE INCREASING TOOL LIFE IN THROUGH HOLES**
- **BOTTOMING STYLE - 2 THREADS TAPERED FOR BLIND HOLES**
- **TOOL LIFE 3-4 TIMES OR MORE THAN CUTTING TAPS**
- **TIN COATED FOR INCREASED TOOL LIFE**
- **MATERIALS: BRASS, COPPER, LEAD, STAINLESS STEELS, CARBON STEEL, LEADED STEEL AND ZINC. DUCTILE MATERIALS PRODUCING STRINGY CHIPS ARE A GOOD CANDIDATE FOR FORMING.**

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS  
**THREAD FORMING TAPS**

# Spiral Point Bottoming Taps



**HIGH SPEED STEEL**

SIZE	H LIMIT	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
0 - 80	H2	2	1	208943	34.37
2 - 56	H2	2	1	208954	26.34
3 - 48	H2	2	1	208965	21.14
4 - 40	H2	2	1	208976	16.96
5 - 40	H2	2	1	208987	16.96
6 - 32	H2	2	1	208998	14.26
6 - 32	H3	2	1	209009	14.26
6 - 40	H2	2	1	209020	16.22
8 - 32	H2	2	1	209031	14.26
8 - 32	H3	2	1	209042	14.26
10 - 24	H2	2	1	209053	16.22
10 - 24	H3	2	1	209064	14.26
10 - 32	H2	2	1	209075	14.26
10 - 32	H3	2	1	209086	14.26
12 - 24	H3	2	1	209097	16.22
1/4 - 20	H3	2	1	209108	14.26
1/4 - 28	H3	2	1	209119	14.26
5/16 - 18	H3	2	1	209130	15.39
5/16 - 24	H3	2	1	209141	15.39

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



**ALL TOOLS ARE 100% MADE IN THE USA**

FOR GENERAL DIMENSIONS SEE PAGE 124

**MADE IN THE USA**

CARRIIDE ENDMILLS  
 CARRIIDE MICRO ENDMILLS  
 CARRIIDE THREADMILLS  
 CARRIIDE DRILL MILLS  
 CARRIIDE DRILLS  
 CARRIIDE REAMERS  
 CARRIIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



# Combination Drill & Taps



**HIGH SPEED STEEL**

SIZE	SHANK DIA.	OVERALL LENGTH	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
4-40	0.141	1-7/8	1/4	0.0910	3/8	2	1	198251	34.56
5-40	0.141	1-15/16	9/32	0.1040	13/32	2	1	198262	34.56
6-32	0.141	2	5/16	0.1115	7/16	2	1	198273	34.56
8-32	0.168	2-1/8	3/8	0.1375	1/2	2	1	198284	34.56
10-24	0.194	2-3/8	13/32	0.1545	5/8	2	1	198295	34.56
10-32	0.194	2-3/8	13/32	0.1635	5/8	2	1	198306	34.56
12-24	0.220	2-3/8	15/32	0.1805	21/32	2	1	198317	37.36
1/4-20	0.255	2-1/2	17/32	0.2080	25/32	2	1	198328	34.56
1/4-28	0.255	2-1/2	17/32	0.2200	25/32	2	1	198339	34.56
5/16-18	0.318	2-27/32	11/16	0.2660	15/16	2	1	198350	51.04
5/16-24	0.318	2-27/32	11/16	0.2770	15/16	2	1	198361	51.04
3/8-16	0.381	3-3/8	13/16	0.3225	1-1/16	2	1	198372	62.03
3/8-24	0.381	3-3/8	13/16	0.3395	1-1/16	2	1	198383	62.03
7/16-14	0.323	3-3/4	1	0.3770	1-1/4	2	1	198394	74.23
7/16-20	0.323	3-3/4	1	0.3955	1-1/4	2	1	198405	74.23
1/2-13	0.367	4-1/16	1-1/8	0.4350	1-3/8	2	1	198416	83.77
1/2-20	0.367	4-1/16	1-1/8	0.4580	1-3/8	2	1	198427	83.77

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



**HIGH SPEED STEEL  
METRIC**

SIZE	SHANK DIA.	OVERALL LENGTH	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
M4 x 0.7	0.168	2-1/8	3/8	0.1340	1/2	2	1	198438	38.03
M5 x 0.8	0.194	2-3/8	13/32	0.1700	5/8	2	1	198449	38.03
M6 x 1.0	0.255	2-1/2	17/32	0.2030	25/32	2	1	198460	38.03
M8 x 1.25	0.318	2-27/32	11/16	0.2730	15/16	2	1	198471	68.90
M10 x 1.50	0.381	3.38	13/16	0.3440	0.69	2	1	198482	78.73
M12 x 1.75	0.367	4-1/16	1-1/8	0.4140	1-3/8	2	1	198493	78.73

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

**COMBINATION DRILL & TAPS**

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

# Taper Pipe Taps



## NPT HIGH SPEED STEEL



UNCOATED



STEAM OXIDE



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	TIN	LIST PRICE
1/16 - 27	4	1	212023	29.65	233396	34.11	233407	38.58
1/8 - 27*	4	1	212034	29.65	233418	34.11	233429	38.58
1/8 - 27	4	1	212045	29.65	233440	34.11	233451	38.58
1/4 - 18	4	1	212056	32.83	233462	37.74	233473	42.69
3/8 - 18	4	1	212067	43.20	233484	49.69	233495	56.15
1/2 - 14	4	1	212078	68.71	233506	79.02	233517	89.30
3/4 - 14	5	1	212089	96.11	233528	110.53	233539	124.95
1 - 11-1/2	5	1	212100	146.06	233550	167.93	233561	175.09
1-1/4 - 11-1/2	5	1	212111	208.18	233572	239.40	233583	270.62
1-1/2 - 11-1/2	7	1	212122	279.23	233594	321.15	233605	363.00
2 - 11-1/2	7	1	212133	379.83	233616	436.82	233627	493.80

\* SMALL SHANK

## NPT - INTERRUPTED HIGH SPEED STEEL



UNCOATED



STEAM OXIDE



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	TIN	LIST PRICE
1/8 - 27*	5	1	212144	46.00	233638	52.90	233649	59.81
1/8 - 27	5	1	212155	46.00	233660	52.90	233671	59.81
1/4 - 18	5	1	212166	50.88	233682	58.49	233693	66.14
3/8 - 18	5	1	212177	64.37	233704	74.01	233715	83.68
1/2 - 14	5	1	212188	102.37	233726	117.72	233737	133.08
3/4 - 14	5	1	212199	148.98	233748	171.30	233759	193.66
1 - 11-1/2	5	1	212210	226.39	233770	260.34	233781	294.29
1-1/4 - 11-1/2	5	1	212221	320.60	233792	368.69	233803	416.77
1-1/2 - 11-1/2	7	1	212232	430.04	233814	494.54	233825	559.04
2 - 11-1/2	7	1	212243	581.17	233836	668.35	233847	755.49

\* SMALL SHANK

FOR GENERAL DIMENSIONS SEE PAGE 124

MADE IN THE USA

TAPER PIPE TAPS

CARRIIDE ENDMILLS  
CARRIIDE MICRO ENDMILLS  
CARRIIDE THREADMILLS  
CARRIIDE DRILL MILLS  
CARRIIDE DRILLS  
CARRIIDE REAMERS  
CARRIIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



# Taper Pipe Taps

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

TAPER PIPE TAPS

## NPTF DRYSEAL HIGH SPEED STEEL



UNCOATED



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	212254	32.64
1/8 - 27*	4	1	212265	32.64
1/8 - 27	4	1	212276	32.64
1/4 - 18	4	1	212287	36.10
3/8 - 18	4	1	212298	47.51
1/2 - 14	4	1	212309	75.58
3/4 - 14	5	1	212320	105.71
1 - 11-1/2	5	1	212331	160.64
1-1/4 - 11-1/2	5	1	212342	228.99
1-1/2 - 11-1/2	7	1	212353	307.14
2 - 11-1/2	7	1	212364	417.83

\* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	245700	48.89
1/8 - 27*	4	1	245711	48.89
1/8 - 27	4	1	245722	48.89
1/4 - 18	4	1	245733	54.09
3/8 - 18	4	1	245744	71.18
1/2 - 14	4	1	245755	113.20
3/4 - 14	5	1	245766	158.36
1 - 11-1/2	5	1	245777	240.65
1-1/4 - 11-1/2	5	1	245788	343.02
1-1/2 - 11-1/2	7	1	245799	460.14
2 - 11-1/2	7	1	245810	625.91

\* SMALL SHANK

## NPTF DRYSEAL - INTERRUPTED HIGH SPEED STEEL



UNCOATED



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27*	5	1	212375	50.59
1/8 - 27	5	1	212386	50.59
1/4 - 18	5	1	212397	55.96
3/8 - 18	5	1	212408	70.80
1/2 - 14	5	1	212419	112.62
3/4 - 14	5	1	212430	163.85
1 - 11-1/2	5	1	212441	249.00
1-1/4 - 11-1/2	5	1	212452	352.63
1-1/2 - 11-1/2	7	1	212463	473.05
2 - 11-1/2	7	1	212474	639.28

\* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27*	5	1	212475	75.81
1/8 - 27	5	1	212476	75.81
1/4 - 18	5	1	212477	83.84
3/8 - 18	5	1	212478	106.06
1/2 - 14	5	1	212479	168.67
3/4 - 14	5	1	212480	245.47
1 - 11-1/2	5	1	212481	373.02
1-1/4 - 11-1/2	5	1	212482	528.27
1-1/2 - 11-1/2	7	1	212483	708.59
2 - 11-1/2	7	1	212484	957.63

\* SMALL SHANK

FOR GENERAL DIMENSIONS SEE PAGE 124

# Pipe Taps



## STRAIGHT PIPE - NPS HIGH SPEED STEEL



UNCOATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212683	47.38
1/4 - 18	4	1	212694	52.42
3/8 - 18	4	1	212705	69.00
1/2 - 14	4	1	212716	109.76
3/4 - 14	5	1	212727	153.51
1 - 11-1/2	5	1	212738	233.26



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212740	70.99
1/4 - 18	4	1	212742	78.54
3/8 - 18	4	1	212744	103.37
1/2 - 14	4	1	212745	164.40
3/4 - 14	5	1	212746	229.96
1 - 11-1/2	5	1	212747	349.45

## EXTENSION TAPER PIPE - NPT HIGH SPEED STEEL



UNCOATED

SIZE	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	6	1	212749	88.82
1/4 - 18	4	6	1	212760	102.37
3/8 - 18	4	6	1	212771	138.51
1/2 - 14	4	6	1	212782	222.28



TIN COATED

SIZE	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	6	1	212784	133.05
1/4 - 18	4	6	1	212786	153.38
3/8 - 18	4	6	1	212788	207.50
1/2 - 14	4	6	1	212790	332.97

FOR GENERAL DIMENSIONS SEE PAGE 124

PIPE TAPS  
CARRIIDE ENDMILLS  
CARRIIDE MICRO ENDMILLS  
CARRIIDE THREADMILLS  
CARRIIDE DRILL MILLS  
CARRIIDE DRILLS  
CARRIIDE REAMERS  
CARRIIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



# Taps

## STI - SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H1	2	1	209262	22.48
5 - 40	H1	2	1	209273	22.48
6 - 32	H2	2	1	209284	22.65
6 - 40	H2	2	1	209295	22.65
8 - 32	H2	2	1	209306	22.87
10 - 24	H2	2	1	209317	23.29
10 - 32	H2	2	1	209328	23.71
12 - 24	H2	2	1	209339	23.71
1/4 - 20	H2	2	1	209350	23.71
1/4 - 28	H2	2	1	209361	24.09
5/16 - 18	H3	3	1	209372	30.45
5/16 - 24	H2	3	1	209383	30.84
3/8 - 16	H3	3	1	209394	37.49
3/8 - 24	H2	3	1	209405	37.94
7/16 - 14	H3	3	1	209416	41.12
7/16 - 20	H3	3	1	209427	41.12
1/2 - 13	H3	3	1	209438	45.77
1/2 - 20	H3	3	1	209449	45.77

## STI - HAND PLUG & BOTTOMING



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
4 - 40	H1	3	1	198933	198944	20.04
5 - 40	H1	3	1	198955	198966	20.04
6 - 32	H2	3	1	198977	198988	20.40
6 - 40	H1	3	1	198999	199010	20.40
8 - 32	H2	3	1	199021	199032	20.88
10 - 24	H2	3	1	199043	199054	20.88
10 - 32	H2	3	1	199065	199076	21.71
12 - 24	H2	3	1	199087	199098	21.71
1/4 - 20	H2	3	1	199109	199120	21.81
1/4 - 28	H2	3	1	199131	199142	21.81
5/16 - 18	H3	4	1	199153	199164	23.54
5/16 - 24	H2	4	1	199175	199186	23.54
3/8 - 16	H3	4	1	199197	199208	25.57
3/8 - 24	H2	4	1	199219	199230	25.57
7/16 - 14	H3	4	1	199241	199252	35.17
7/16 - 20	H3	4	1	199263	199274	35.17
1/2 - 13	H3	4	1	199285	199296	39.48
1/2 - 20	H3	4	1	199307	199318	39.48

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	PKG. QTY.	ITEM#	LIST PRICE
6 - 32	H11	2	1	209152	11.63
8 - 32	H11	2	1	209163	11.63
10 - 24	H11	2	1	209174	12.66
10 - 32	H11	2	1	209185	12.66
1/4 - 20	H11	2	1	209196	14.42
5/16 - 18	H11	2	1	209207	16.57
3/8 - 16	H11	3	1	209218	18.82
7/16 - 14	H11	3	1	209229	28.27
1/2 - 13	H11	3	1	209240	34.40
5/8 - 11	H11	3	1	209251	58.62

## + .005 OVERSIZE HAND PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
6 - 32	H11	3	1	207051	9.67
8 - 32	H11	4	1	207062	9.67
10 - 24	H11	4	1	207073	10.70
10 - 32	H11	4	1	207084	10.70
1/4 - 20	H11	4	1	207095	12.75
5/16 - 18	H11	4	1	207106	16.06
3/8 - 16	H11	4	1	207117	18.44
7/16 - 14	H11	4	1	207128	26.69
1/2 - 13	H11	4	1	207139	31.32
5/8 - 11	H11	4	1	207150	58.97

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

FOR GENERAL DIMENSIONS SEE PAGE 124

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

TAPS

# Taps



## PULLEY - PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/4 - 20	H3	4	6	1	209460	68.23
1/4 - 20	H3	4	8	1	209471	84.35
5/16 - 18	H3	4	6	1	209482	71.95
5/16 - 18	H3	4	8	1	209493	86.86
3/8 - 16	H3	4	6	1	209504	80.62
3/8 - 16	H3	4	8	1	209515	96.75
3/8 - 16	H3	4	10	1	209526	121.58
7/16 - 14	H3	4	6	1	209537	85.60
7/16 - 14	H3	4	8	1	209548	111.65
1/2 - 13	H3	4	6	1	209559	86.86

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/2 - 13	H3	4	8	1	209570	114.13
1/2 - 13	H3	4	10	1	209581	140.18
1/2 - 13	H3	4	12	1	209592	172.43
5/8 - 11	H3	4	6	1	209603	115.38
5/8 - 11	H3	4	8	1	209614	150.10
5/8 - 11	H3	4	10	1	209625	188.58
5/8 - 11	H3	4	12	1	209636	220.83
3/4 - 10	H3	4	10	1	209647	220.83
3/4 - 10	H3	4	12	1	209658	263.01
-	-	-	-	-	-	-

## 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	PKG. QTY.	ITEM#	LIST PRICE
6 - 32	H3	6	NC	11/16	3/16	0.097	0.073	2	1	212485	69.22
8 - 32	H3	6	NC	3/4	1/4	0.123	0.092	2	1	212496	67.81
10 - 24	H3	6	NC	7/8	1/4	0.136	0.102	2	1	212507	63.57
10 - 32	H3	6	NF	7/8	1/4	0.136	0.102	2	1	212518	63.57
1/4 - 20	H3	6	NC	1	5/16	0.185	0.139	2	1	212529	86.73
1/4 - 28	H3	6	NF	1	5/16	0.185	0.139	2	1	212540	86.73
5/16 - 18	H3	6	NC	1-1/8	3/8	0.240	0.180	2	1	212551	91.03
5/16 - 24	H3	6	NF	1-1/8	3/8	0.240	0.180	2	1	212562	91.03
3/8 - 16	H3	6	NC	1-1/4	7/16	0.275	0.206	3	1	212573	98.07
3/8 - 24	H3	6	NF	1-1/4	7/16	0.275	0.206	3	1	212584	98.07
7/16 - 14	H3	6	NC	1-7/16	13/32	0.323	0.242	3	1	212595	112.42
7/16 - 20	H3	6	NF	1-7/16	13/32	0.323	0.242	3	1	212606	112.42
1/2 - 13	H3	6	NC	1-21/32	7/16	0.367	0.275	3	1	212617	118.01
1/2 - 20	H3	6	NF	1-21/32	7/16	0.367	0.275	3	1	212628	118.01
5/8 - 11	H3	6	NC	1-13/16	9/16	0.480	0.360	3	1	212639	152.48
5/8 - 18	H3	6	NF	1-13/16	9/16	0.480	0.360	3	1	212650	152.48
3/4 - 10	H3	6	NC	2	11/16	0.590	0.442	3	1	212661	198.03
3/4 - 16	H3	6	NF	2	11/16	0.590	0.442	3	1	212672	198.03

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

FOR GENERAL DIMENSIONS SEE PAGE 124

TAPS  
CARRIIDE ENDMILLS  
CARRIIDE MICRO ENDMILLS  
CARRIIDE THREADMILLS  
CARRIIDE DRILL MILLS  
CARRIIDE DRILLS  
CARRIIDE REAMERS  
CARRIIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS



# HSS Dies & Die Stocks

## ADJUSTABLE ROUND SPLIT



HIGH SPEED STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
4-40	1	171708	54.06
5-40	13/16	171719	44.64
5-44	13/16	171730	44.64
6-32	13/16	171741	44.64
6-32	1	171752	54.06
6-40	13/16	171763	44.64
8-32	13/16	171774	44.64
8-32	1	171785	54.06
10-24	13/16	171796	44.64
10-24	1	171807	54.06
10-32	13/16	171818	44.64
10-32	1	171829	54.06
12-24	13/16	171840	44.64
12-24	1	171851	54.06
12-28	13/16	171862	44.64
1/4-20	13/16	171873	44.64
1/4-20	1	171884	54.06

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
1/4-20	1-1/2	171895	88.39
1/4-28	13/16	171906	44.64
1/4-28	1	171917	54.06
1/4-28	1-1/2	171928	88.39
5/16-18	13/16	171939	44.64
5/16-18	1	171950	54.06
5/16-18	1-1/2	171961	88.39
5/16-24	13/16	171972	44.64
5/16-24	1	171983	54.06
5/16-24	1-1/2	171994	88.39
3/8-16	1	172005	54.06
3/8-16	1-1/2	172016	88.39
3/8-24	1	172027	54.06
3/8-24	1-1/2	172038	88.39
7/16-14	1	172049	54.06
7/16-14	1-1/2	172060	88.39
7/16-20	1	172071	54.06

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
7/16-20	1-1/2	172082	88.39
1/2-13	1	172093	54.06
1/2-13	1-1/2	172104	88.39
1/2-20	1	172115	54.06
1/2-20	1-1/2	172126	88.39
9/16-12	1-1/2	172137	88.39
9/16-18	1-1/2	172148	88.39
5/8-11	1-1/2	172159	88.39
5/8-11	2	172170	120.15
5/8-18	1-1/2	172181	88.39
5/8-18	2	172192	120.15
3/4-10	1-1/2	172203	88.39
3/4-10	2	172214	120.15
3/4-16	1-1/2	172225	88.39
3/4-16	2	172236	120.15
7/8-9	2	172247	120.15
7/8-14	2	172258	120.15

## DIE STOCKS



SIZE	ITEM#	LIST PRICE
1 OD	170201	40.24
1-1/2 OD	170212	65.91
2 OD	170223	116.03

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

### HSS DIES & DIE STOCKS

# Carbon Steel Dies



## ADJUSTABLE ROUND SPLIT



CARBON STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
6-32	1	170377	35.15
8-32	1	170410	35.15
10-24	1	170443	35.15
10-32	1	170465	35.15
1/4-20	1	170531	35.15
1/4-20	1-1/2	170542	57.52
1/4-28	1	170553	35.15
1/4-32	1	170586	35.15
5/16-18	1	170597	35.15
5/16-18	1-1/2	170608	57.52
5/16-24	1	170619	35.15
5/16-24	1-1/2	170630	57.52
5/16-32	1	170641	35.15
3/8-16	1	170652	35.15
3/8-16	1-1/2	170663	57.52

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
3/8-24	1	170674	35.15
3/8-24	1-1/2	170685	57.52
7/16-14	1	170696	35.15
7/16-14	1-1/2	170707	57.52
7/16-20	1	170718	35.15
1/2-13	1-1/2	170740	57.52
1/2-20	1-1/2	170751	57.52
9/16-12	1-1/2	170762	57.52
9/16-18	1-1/2	170773	57.52
5/8-11	1-1/2	170784	57.52
5/8-11	2-1/2	170795	145.91
5/8-18	1-1/2	170806	57.52
3/4-10	2-1/2	170817	145.91
3/4-16	2-1/2	170828	145.91
7/8-9	2-1/2	170850	145.91

## HEXAGON RETHREADING



CARBON STEEL

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/4-20	19/32	1/4	171037	20.61
1/4-28	19/32	1/4	171048	20.61
5/16-18	11/16	5/16	171059	24.03
5/16-24	11/16	5/16	171070	24.03
3/8-16	25/32	3/8	171081	26.61
3/8-24	25/32	3/8	171092	26.61
7/16-14	7/8	7/16	171103	32.61
7/16-20	7/8	7/16	171114	32.61
1/2-13	1-1/16	1/2	171125	36.06
1/2-20	1-1/16	1/2	171136	36.06
9/16-12	1-1/16	1/2	171147	38.61
9/16-18	1-1/16	1/2	171158	38.61
5/8-11	1-1/4	5/8	171169	40.33
5/8-18	1-1/4	5/8	171180	40.33
11/16-11	1-7/16	3/4	171191	44.64
11/16-16	1-7/16	3/4	171202	44.64

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
3/4-10	1-7/16	3/4	171213	49.79
3/4-16	1-7/16	3/4	171224	49.79
7/8-9	1-5/8	7/8	171235	54.06
7/8-14	1-5/8	7/8	171246	54.06
1-8	1-13/16	1	171257	60.94
1-12	1-13/16	1	171268	60.94
1-14	1-13/16	1	171279	60.94
1-1/8-7	2	1	171290	70.36
1-1/8-12	2	1	171301	70.36
1-1/4-7	2-3/16	1	171312	77.24
1-1/4-12	2-3/16	1	171323	77.24
1-3/8-6	2-3/8	1	171334	145.91
1-3/8-12	2-3/8	1	171345	145.91
1-1/2-6	2-9/16	1	171356	163.06
1-1/2-12	2-9/16	1	171367	163.06
-	-	-	-	-

CARBON STEEL DIES

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Dies & Accessories

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS



**NPT HEXAGON  
RETHREADING  
CARBON STEEL**

SIZE	ACROSS THE FLATS	THICKNESS	ITEM#	LIST PRICE
1/8 - 27 NPT	1-1/16	3/8	171576	28.48
1/4 - 18 NPT	1-1/4	5/8	171587	31.58
3/8 - 18 NPT	1-7/16	5/8	171598	43.67
1/2 - 14 NPT	1-5/8	3/4	171609	63.09
3/4 - 14 NPT	2	13/16	171620	78.00
1 - 11-1/2 NPT	2-3/8	1	171631	151.00



**METRIC HEXAGON  
RETHREADING  
CARBON STEEL**

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M3 x 0.5	1	171378	15.70
M4 x 0.7	1	171389	15.27
M5 x 0.8	1	171400	15.27
M6 x 1.0	1	171411	15.27
M7 x 1.0	1	171422	15.70
M8 x 1.25	1	171433	15.27
M10 x 1.25	1	171444	15.27
M10 x 1.50	1	171455	15.27
M12 x 1.25	1	171466	15.27

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M12 x 1.75	1	171477	15.27
M14 x 1.50	1-7/16	171488	23.70
M14 x 2.0	1-7/16	171499	23.70
M16 x 1.50	1-7/16	171510	23.70
M16 x 2.0	1-7/16	171521	23.70
M18 x 1.50	1-7/16	171532	23.70
M18 x 2.50	1-7/16	171543	23.70
M20 x 2.5	1-13/16	171554	49.48
M24 x 3.0	1-13/16	171565	49.48

**T - HANDLE  
TAP WRENCHES**



SIZE	ITEM#	LIST PRICE
0 - 1/4	170146	13.03
1/4 - 1/2	170157	19.52

**ADJUSTABLE HANDLE  
TAP WRENCHES**



SIZE	ITEM#	LIST PRICE
0 - 1/2	170168	41.48
1/2 - 1	170179	108.30

# Tap & Die Sets



## HIGH SPEED STEEL - 1" RD ADJ T&D SET

ITEM#	LIST PRICE
171686	922.64

**DESCRIPTION:** 37PC TAP & DIE SET IN A PLASTIC CASE  
4-40, 6-32, 8-32, 10-24, 10-32, 12-24, 1/4-20, 1/4-28, 5/16-18, 5/16-24,  
3/8-16, 3/8-24, 7/16-14, 7/16-20, 1/2-13, 1/2-20, (17TAPS-17DIES),  
WRENCH, DIE STK, P GAGE, T-HANDLE, SCREW DRIVER



## CARBON STEEL - METRIC - HEX T&D SET

ITEM#	LIST PRICE
171697	339.00

**DESCRIPTION:** 41PC METRIC HEX TAP & DIE SET IN A PLASTIC CASE  
5/8 HEX DIES - M3 x .5, M4 x .7, M4 x .75, M5 x .8, M5 x .9, M6 x 1.0 WITH SAME  
TAPS, 1" HEX DIES - M7 x 1.0, M8 x 1.0, M8 x 1.25, M9 x 1.0, M9 x 1.25, M10 x 1.25,  
M10 x 1.50, M11 x 1.5, M12 x 1.5, M12 x 1.75, 1/8-28BSP WITH SAME TAP SIZES,  
PLAIN DIE STK, ADJ DIE STK, ADJ HANDLE, T-HANDLE, HEX NUT WITH 3/8" DRIVE,  
METRIC PITCH GAGE, SCREW DRIVER



## CARBON STEEL - HEX DIE SET

ITEM#	LIST PRICE
171642	283.21

**DESCRIPTION:** 10PC NC HEX DIE SET IN A WOOD BOX  
1/4-20, 5/16-18, 3/8-16, 7/16-14, 1/2-13, 9/16-12, 5/8-11, 3/4-10, 7/8-9, 1"-8

ITEM#	LIST PRICE
171653	283.21

**DESCRIPTION:** 10PC NF HEX DIE SET IN A WOOD BOX  
1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16, 7/8-14, 1"-12



## HIGH SPEED STEEL - 1-1/2" RD ADJ T&D SET

ITEM#	LIST PRICE
171664	853.97

**DESCRIPTION:** 21PC NC TAP & DIE SET IN A WOOD BOX  
1/4-20, 5/16-18, 3/8-16, 7/16-14, 1/2-13, 9/16-12, 5/8-11, 3/4-10  
(8 TAPS-8 DIES), WRENCH, DIE STK, GAGE, T-HANDLE, SCREW DRIVER

ITEM#	LIST PRICE
171675	853.97

**DESCRIPTION:** 21PC NF TAP & DIE SET IN A WOOD BOX  
1/4-28, 5/16-24, 3/8-24, 7/16-20, 1/2-20, 9/16-18, 5/8-18, 3/4-16  
(8 TAPS-8 DIES), WRENCH, DIE STK, P GAGE, T-HANDLE, SCREW DRIVER

TAP & DIE SETS



# Technical Information

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**TECHNICAL INFORMATION**

## 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 119 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

# Drill Sets



**ITEM# 120250**  
29 PC. JOBBER DRILL SET - BRIGHT FINISH  
HIGH SPEED STEEL



**ITEM# 120261**  
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	35.08
13Pc. • 1/16" - 1/4" by 64ths • 118° Point • Bright	120118	35.08
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Oxided	120140	97.94
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Bright	120162	97.94
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Oxided	120173	108.02
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Oxided	120184	82.78
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Bright	120195	82.78
25Pc. • 1.0mm - 13.0mm by 0.5mm • 118° Point • Oxided	120203	189.03
26Pc. • A-Z • 118° Point • Oxided	120217	138.54
26Pc. • A-Z • 118° Point • Bright	120228	138.54
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Oxided	120239	134.59
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Bright	120250	134.59
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Oxided	120272	167.51
29Pc. • 1/16" - 1/2" by 64ths • 3/8" Reduced Shank • 118° Point • Oxided	120283	143.42
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • TIN Coated	120294	332.84
60Pc. • #1 - #60 • 118° Point • Oxided	120305	121.74
60Pc. • #1 - #60 • 118° Point • Bright	120316	121.74
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Oxided	120327	386.84
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Bright	120338	386.84

## 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	43.75
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Black/Gold	120151	126.72
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120206	124.12
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120261	202.75
29Pc. • 1/16" - 1/2" by 64ths • H.D. • 135° SP/PT • Black/Gold • Plastic Case	120569	202.75
115Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120349	484.20

HSS DRILL SETS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

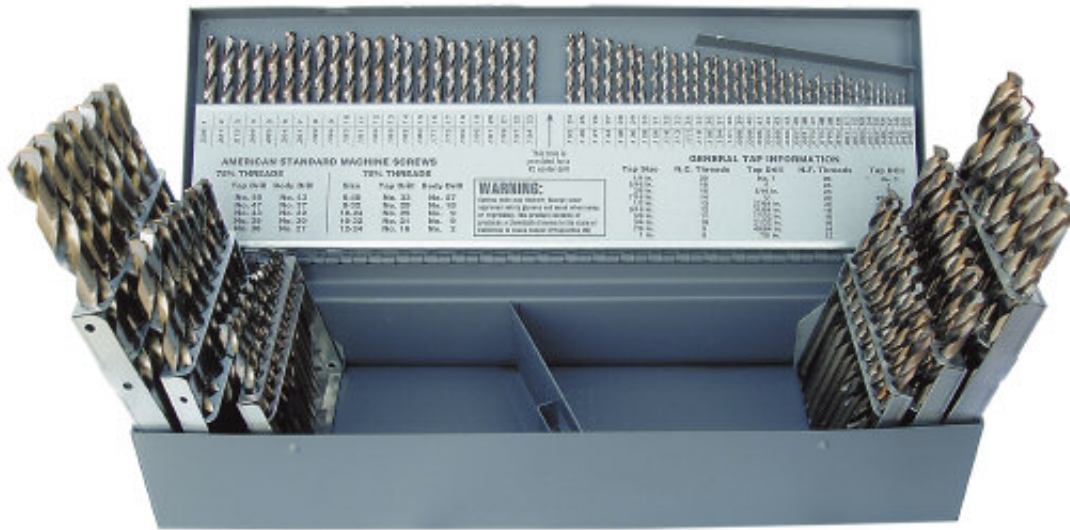
TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Drill Sets



**ITEM# 120426**

**115 PC. JOBBER DRILL SET - M42 COBALT - STRAW FINISH**

**M42 COBALT - JOBBER DRILL SETS**

DESCRIPTION	ITEM#	LIST PRICE
13Pc. • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120360	47.28
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Straw Finish	120371	159.55
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120382	173.78
26Pc. • A - Z • Heavy Duty • 135° SP/PT • Straw Finish	120393	264.61
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120404	258.99
60Pc. • #1 - #60 • Heavy Duty • 135° SP/PT • Straw Finish	120415	226.07
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT • Straw Finish	120426	953.42

**DRILL INDEXES ONLY**

DESCRIPTION	ITEM#	LIST PRICE
21Pc. • 1/16" - 3/8" by 64ths • Metal Case	120492	12.85
26Pc. • A - Z • Metal Case	120503	13.84
29Pc. • 1/16" - 1/2" by 64ths • Metal Case	120514	13.84
60Pc. • #1 - #60 • Metal Case	120525	13.75
115Pc. • 1/16" - 1/2" by 64ths, A - Z, #1 - #60 • Metal Case	120536	84.93

**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)	120437	180.46

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS  
**HSS & COBALT DRILL SETS**

# Drill Sets



**ITEM# 120470**  
**8 PC. SILVER & DEMING DRILL SET**  
**M42 COBALT - STRAW FINISH**

## 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 • In Plastic Case	120448	327.09
33Pc. • HSS • 1/2" - 1" by 64ths • 118° Point • Metal Stand	120459	1,471.54
8Pc. • M42 Cobalt • 118° Split Point • In Plastic Case	120470	477.87
8Pc. • HSS • Black & Gold • 118° Split Point • In Plastic Case	120481	415.39



**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	119.27
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Metal Case	120547	220.09
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Plastic Case	120580	220.09

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

**HSS & COBALT DRILL SETS**

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS



# High Speed Steel Drills

## JOBBER LENGTH - 118° POINT



BRIGHT FINISH

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HSS JOBBER DRILLS**

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/64	3/16	3/4	12	106280	3.30
1/32	1/2	1-3/8	12	106291	2.33
3/64	3/4	1-3/4	12	106302	2.33
1/16	7/8	1-7/8	12	106313	1.42
5/64	1	2	12	106324	1.42
3/32	1-1/4	2-1/4	12	106335	1.42
7/64	1-1/2	2-5/8	12	106346	1.42
1/8	1-5/8	2-3/4	12	106357	1.42
9/64	1-3/4	2-7/8	12	106368	1.52
5/32	2	3-1/8	12	106379	1.58
11/64	2-1/8	3-1/4	12	106390	1.70

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/16	2-5/16	3-1/2	12	106401	1.85
13/64	2-7/16	3-5/8	12	106412	2.09
7/32	2-1/2	3-3/4	12	106423	2.30
15/64	2-5/8	3-7/8	12	106434	2.58
1/4	2-3/4	4	12	106445	2.64
17/64	2-7/8	4-1/4	6	106456	3.79
9/32	2-15/16	4-1/4	6	106467	4.03
19/64	3-1/16	4-3/8	6	106478	4.42
5/16	3-3/16	4-1/2	6	106489	4.61
21/64	3-5/16	4-5/8	6	106500	5.15
11/32	3-7/16	4-3/4	6	106511	5.52

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
23/64	3-1/2	4-7/8	6	106522	6.06
3/8	3-5/8	5	6	106533	6.36
25/64	3-3/4	5-1/8	6	106544	6.88
13/32	3-7/8	5-1/4	6	106555	7.52
27/64	3-15/16	5-3/8	6	106566	8.00
7/16	4-1/16	5-1/2	6	106577	8.73
29/64	4-3/16	5-5/8	6	106588	9.30
15/32	4-5/16	5-3/4	6	106599	10.12
31/64	4-3/8	5-7/8	6	106610	10.70
1/2	4-1/2	6	6	106621	11.15
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	107512	2.58
B	2-3/4	4	12	107523	2.64
C	2-3/4	4	12	107534	2.64
D	2-3/4	4	12	107545	2.73
E	2-3/4	4	12	107556	2.76
F	2-7/8	4-1/8	6	107567	3.82
G	2-7/8	4-1/8	6	107578	3.67
H	2-7/8	4-1/8	6	107589	3.73
I	2-7/8	4-1/8	6	107600	3.82

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	107611	3.94
K	2-15/16	4-1/4	6	107622	4.03
L	2-15/16	4-1/4	6	107633	4.21
M	3-1/16	4-3/8	6	107644	4.45
N	3-1/16	4-3/8	6	107655	4.61
O	3-3/16	4-1/2	6	107666	5.00
P	3-5/16	4-5/8	6	107677	5.36
Q	3-7/16	4-3/4	6	107688	5.58
R	3-7/16	4-3/4	6	107699	5.79

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	107710	6.06
T	3-1/2	4-7/8	6	107721	6.36
U	3-5/8	5	6	107732	6.88
V	3-5/8	5	6	107743	7.12
W	3-3/4	5-1/8	6	107754	7.58
X	3-3/4	5-1/8	6	107765	8.03
Y	3-7/8	5-1/4	6	107776	8.42
Z	3-7/8	5-1/4	6	107787	8.61
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	106632	2.82
2	2-5/8	3-7/8	12	106643	2.82
3	2-1/2	3-3/4	12	106654	2.58
4	2-1/2	3-3/4	12	106665	2.58
5	2-1/2	3-3/4	12	106676	2.55
6	2-1/2	3-3/4	12	106687	2.55
7	2-7/16	3-5/8	12	106698	2.45
8	2-7/16	3-5/8	12	106709	2.45
9	2-7/16	3-5/8	12	106720	2.42
10	2-7/16	3-5/8	12	106731	2.21
11	2-5/16	3-1/2	12	106742	2.21
12	2-5/16	3-1/2	12	106753	2.21
13	2-5/16	3-1/2	12	106764	2.21
14	2-3/16	3-3/8	12	106775	2.09
15	2-3/16	3-3/8	12	106786	2.09
16	2-3/16	3-3/8	12	106797	2.09
17	2-3/16	3-3/8	12	106808	2.00
18	2-1/8	3-1/4	12	106819	2.00
19	2-1/8	3-1/4	12	106830	2.00
20	2-1/8	3-1/4	12	106841	1.79
21	2-1/8	3-1/4	12	106852	1.79
22	2	3-1/8	12	106863	1.70
23	2	3-1/8	12	106874	1.70
24	2	3-1/8	12	106885	1.70
25	1-7/8	3	12	106896	1.48
26	1-7/8	3	12	106907	1.48
27	1-7/8	3	12	106918	1.48

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
28	1-3/4	2-7/8	12	106929	1.36
29	1-3/4	2-7/8	12	106940	1.36
30	1-5/8	2-3/4	12	106951	1.33
31	1-5/8	2-3/4	12	106962	1.30
32	1-5/8	2-3/4	12	106973	1.30
33	1-1/2	2-5/8	12	106984	1.30
34	1-1/2	2-5/8	12	106995	1.30
35	1-1/2	2-5/8	12	107006	1.30
36	1-7/16	2-1/2	12	107017	1.30
37	1-7/16	2-1/2	12	107028	1.30
38	1-7/16	2-1/2	12	107039	1.30
39	1-3/8	2-3/8	12	107050	1.30
40	1-3/8	2-3/8	12	107061	1.30
41	1-3/8	2-3/8	12	107072	1.30
42	1-1/4	2-1/4	12	107083	1.30
43	1-1/4	2-1/4	12	107094	1.30
44	1-1/8	2-1/8	12	107105	1.30
45	1-1/8	2-1/8	12	107116	1.36
46	1-1/8	2-1/8	12	107127	1.36
47	1	2	12	107138	1.36
48	1	2	12	107149	1.36
49	1	2	12	107160	1.36
50	1	2	12	107171	1.36
51	1	2	12	107182	1.36
52	7/8	1-7/8	12	107193	1.36
53	7/8	1-7/8	12	107204	1.36
54	7/8	1-7/8	12	107215	1.45

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
55	7/8	1-7/8	12	107226	1.45
56	3/4	1-3/4	12	107237	1.45
57	3/4	1-3/4	12	107248	1.61
58	11/16	1-5/8	12	107259	1.61
59	11/16	1-5/8	12	107270	1.61
60	11/16	1-5/8	12	107281	1.61
61	11/16	1-5/8	12	107292	1.87
62	5/8	1-1/2	12	107303	1.87
63	5/8	1-1/2	12	107314	1.87
64	5/8	1-1/2	12	107325	1.87
65	5/8	1-1/2	12	107336	1.87
66	1/2	1-3/8	12	107347	1.87
67	1/2	1-3/8	12	107358	1.87
68	1/2	1-3/8	12	107369	1.87
69	1/2	1-3/8	12	107380	1.87
70	3/8	1-1/4	12	107391	1.87
71	3/8	1-1/4	12	107402	1.87
72	5/16	1-1/8	12	107413	1.87
73	5/16	1-1/8	12	107424	2.43
74	1/4	1	12	107435	2.43
75	1/4	1	12	107446	2.43
76	3/16	7/8	12	107457	2.43
77	3/16	7/8	12	107468	2.77
78	3/16	7/8	12	107479	2.77
79	1/8	3/4	12	107490	2.77
80	1/8	3/4	12	107501	2.77
-	-	-	-	-	-

# High Speed Steel Drills



## JOBBER LENGTH - 118° POINT



TIN COATED

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
1/16	7/8	1-7/8	12	110647	3.95	7/32	2-1/2	3-3/4	12	110757	7.32	3/8	3-5/8	5	6	110867	18.24	
5/64	1	2	12	110658	3.95	15/64	2-5/8	3-7/8	12	110768	7.64	25/64	3-3/4	5-1/8	6	110878	22.58	
3/32	1-1/4	2-1/4	12	110669	3.95	1/4	2-3/4	4	12	110779	7.84	13/32	3-7/8	5-1/4	6	110889	23.10	
7/64	1-1/2	2-5/8	12	110680	4.02	17/64	2-7/8	4-1/8	6	110790	11.15	27/64	3-15/16	5-3/8	6	110900	23.90	
1/8	1-5/8	2-3/4	12	110691	4.02	9/32	2-15/16	4-1/4	6	110801	12.37	7/16	4-1/16	5-1/2	6	110911	24.41	
9/64	1-3/4	2-7/8	12	110702	4.21	19/64	3-1/16	4-3/8	6	110812	12.62	29/64	4-3/16	5-5/8	6	110922	26.82	
5/32	2	3-1/8	12	110713	4.69	5/16	3-3/16	4-1/2	6	110823	13.33	15/32	4-5/16	5-3/4	6	110933	27.59	
11/64	2-1/8	3-1/4	12	110724	4.75	21/64	3-5/16	4-5/8	6	110834	15.19	31/64	4-3/8	5-7/8	6	110944	27.82	
3/16	2-5/16	3-1/2	12	110735	5.01	11/32	3-7/16	4-3/4	6	110845	16.00	1/2	4-1/2	6	6	110955	28.40	
13/64	2-7/16	3-5/8	12	110746	7.13	23/64	3-1/2	4-7/8	6	110856	18.05	-	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
A	2-5/8	3-7/8	12	110966	7.97	J	2-7/8	4-1/8	6	111065	13.56	S	3-1/2	4-7/8	6	111164	20.36	
B	2-3/4	4	12	110977	8.16	K	2-15/16	4-1/4	6	111076	14.58	T	3-1/2	4-7/8	6	111175	21.33	
C	2-3/4	4	12	110988	8.16	L	2-15/16	4-1/4	6	111087	14.58	U	3-5/8	5	6	111186	21.33	
D	2-3/4	4	12	110999	8.16	M	3-1/16	4-3/8	6	111098	14.84	V	3-5/8	5	6	111197	21.62	
E	2-3/4	4	12	111010	7.84	N	3-1/16	4-3/8	6	111109	15.10	W	3-3/4	5-1/8	6	111208	25.02	
F	2-7/8	4-1/8	6	111021	13.46	O	3-3/16	4-1/2	6	111120	15.10	X	3-3/4	5-1/8	6	111219	26.95	
G	2-7/8	4-1/8	6	111032	13.46	P	3-5/16	4-5/8	6	111131	15.74	Y	3-7/8	5-1/4	6	111230	28.72	
H	2-7/8	4-1/8	6	111043	13.46	Q	3-7/16	4-3/4	6	111142	15.74	Z	3-7/8	5-1/4	6	111241	29.04	
I	2-7/8	4-1/8	6	111054	13.46	R	3-7/16	4-3/4	6	111153	16.16	-	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	111252	7.97	21	2-1/8	3-1/4	12	111472	5.14	41	1-3/8	2-3/8	12	111692	3.95
2	2-5/8	3-7/8	12	111263	7.97	22	2	3-1/8	12	111483	5.14	42	1-1/4	2-1/4	12	111703	3.95
3	2-1/2	3-3/4	12	111274	7.64	23	2	3-1/8	12	111494	5.08	43	1-1/4	2-1/4	12	111714	3.95
4	2-1/2	3-3/4	12	111285	7.64	24	2	3-1/8	12	111505	5.08	44	1-1/8	2-1/8	12	111725	3.95
5	2-1/2	3-3/4	12	111296	7.64	25	1-7/8	3	12	111516	4.98	45	1-1/8	2-1/8	12	111736	3.95
6	2-1/2	3-3/4	12	111307	7.64	26	1-7/8	3	12	111527	4.98	46	1-1/8	2-1/8	12	111747	3.95
7	2-7/16	3-5/8	12	111318	7.26	27	1-7/8	3	12	111538	4.98	47	1	2	12	111758	3.95
8	2-7/16	3-5/8	12	111329	7.26	28	1-3/4	2-7/8	12	111549	4.82	48	1	2	12	111769	3.95
9	2-7/16	3-5/8	12	111340	7.26	29	1-3/4	2-7/8	12	111560	4.82	49	1	2	12	111780	3.95
10	2-7/16	3-5/8	12	111351	7.26	30	1-5/8	2-3/4	12	111571	4.02	50	1	2	12	111791	3.95
11	2-5/16	3-1/2	12	111362	7.26	31	1-5/8	2-3/4	12	111582	4.02	51	1	2	12	111802	3.95
12	2-5/16	3-1/2	12	111373	5.94	32	1-5/8	2-3/4	12	111593	4.02	52	7/8	1-7/8	12	111813	3.95
13	2-5/16	3-1/2	12	111384	5.85	33	1-1/2	2-5/8	12	111604	4.02	53	7/8	1-7/8	12	111824	3.95
14	2-3/16	3-3/8	12	111395	5.85	34	1-1/2	2-5/8	12	111615	4.02	54	7/8	1-7/8	12	111835	3.95
15	2-3/16	3-3/8	12	111406	5.85	35	1-1/2	2-5/8	12	111626	4.02	55	7/8	1-7/8	12	111846	3.95
16	2-3/16	3-3/8	12	111417	5.85	36	1-7/16	2-1/2	12	111637	3.95	56	3/4	1-3/4	12	111857	3.95
17	2-3/16	3-3/8	12	111428	5.85	37	1-7/16	2-1/2	12	111648	3.95	57	3/4	1-3/4	12	111868	3.95
18	2-1/8	3-1/4	12	111439	5.20	38	1-7/16	2-1/2	12	111659	3.95	58	11/16	1-5/8	12	111879	3.95
19	2-1/8	3-1/4	12	111450	5.20	39	1-3/8	2-3/8	12	111670	3.95	59	11/16	1-5/8	12	111890	3.95
20	2-1/8	3-1/4	12	111461	5.20	40	1-3/8	2-3/8	12	111681	3.95	60	11/16	1-5/8	12	111901	3.95

HSS JOBBER DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# High Speed Steel Drills

## JOBBER LENGTH - 118° POINT



OXIDE FINISH

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS  
**HSS JOBBER DRILLS**

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/64	3/16	3/4	12	104630	3.30
1/32	1/2	1-3/8	12	104641	2.33
3/64	3/4	1-3/4	12	104652	2.33
1/16	7/8	1-7/8	12	104663	1.42
5/64	1	2	12	104674	1.42
3/32	1-1/4	2-1/4	12	104685	1.42
7/64	1-1/2	2-5/8	12	104696	1.42
1/8	1-5/8	2-3/4	12	104707	1.42
9/64	1-3/4	2-7/8	12	104718	1.52
5/32	2	3-1/8	12	104729	1.58
11/64	2-1/8	3-1/4	12	104740	1.70
3/16	2-5/16	3-1/2	12	104751	1.85
13/64	2-7/16	3-5/8	12	104762	2.09
7/32	2-1/2	3-3/4	12	104773	2.30
15/64	2-5/8	3-7/8	12	104784	2.58

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/4	2-3/4	4	12	104795	2.64
17/64	2-7/8	4-1/8	6	104806	3.79
9/32	2-15/16	4-1/4	6	104817	4.03
19/64	3-1/16	4-3/8	6	104828	4.42
5/16	3-3/16	4-1/2	6	104839	4.61
21/64	3-5/16	4-5/8	6	104850	5.15
11/32	3-7/16	4-3/4	6	104861	5.52
23/64	3-1/2	4-7/8	6	104872	6.06
3/8	3-5/8	5	6	104883	6.36
25/64	3-3/4	5-1/8	6	104894	6.88
13/32	3-7/8	5-1/4	6	104905	7.52
27/64	3-15/16	5-3/8	6	104916	8.00
7/16	4-1/16	5-1/2	6	104927	8.73
29/64	4-3/16	5-5/8	6	104938	9.30
15/32	4-5/16	5-3/4	6	104949	10.12

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
31/64	4-3/8	5-7/8	6	104960	10.70
1/2	4-1/2	6	6	104971	11.15
33/64	4-13/16	6-5/8	1	104982	26.64
17/32	4-13/16	6-5/8	1	104993	27.91
35/64	4-13/16	6-5/8	1	105004	30.21
9/16	4-13/16	6-5/8	1	105015	31.64
37/64	4-13/16	6-5/8	1	105026	31.73
19/32	5-3/16	7-1/8	1	105037	32.61
39/64	5-3/16	7-1/8	1	105048	35.82
5/8	5-3/16	7-1/8	1	105059	34.97
41/64	5-3/16	7-1/8	1	105070	38.24
21/32	5-3/16	7-1/8	1	105081	36.94
43/64	5-5/8	7-5/8	1	105092	43.42
11/16	5-5/8	7-5/8	1	105103	42.48
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	105994	2.58
B	2-3/4	4	12	106005	2.64
C	2-3/4	4	12	106016	2.64
D	2-3/4	4	12	106027	2.73
E	2-3/4	4	12	106038	2.76
F	2-7/8	4-1/8	6	106049	3.82
G	2-7/8	4-1/8	6	106060	3.67
H	2-7/8	4-1/8	6	106071	3.73
I	2-7/8	4-1/8	6	106082	3.82

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	106093	3.94
K	2-15/16	4-1/4	6	106104	4.03
L	2-15/16	4-1/4	6	106115	4.21
M	3-1/16	4-3/8	6	106126	4.45
N	3-1/16	4-3/8	6	106137	4.61
O	3-3/16	4-1/2	6	106148	5.00
P	3-5/16	4-5/8	6	106159	5.36
Q	3-7/16	4-3/4	6	106170	5.58
R	3-7/16	4-3/4	6	106181	5.79

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	106192	6.06
T	3-1/2	4-7/8	6	106203	6.36
U	3-5/8	5	6	106214	6.88
V	3-5/8	5	6	106225	7.12
W	3-3/4	5-1/8	6	106236	7.58
X	3-3/4	5-1/8	6	106247	8.03
Y	3-7/8	5-1/4	6	106258	8.42
Z	3-7/8	5-1/4	6	106269	8.61
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	105114	2.82
2	2-5/8	3-7/8	12	105125	2.82
3	2-1/2	3-3/4	12	105136	2.58
4	2-1/2	3-3/4	12	105147	2.58
5	2-1/2	3-3/4	12	105158	2.55
6	2-1/2	3-3/4	12	105169	2.55
7	2-7/16	3-5/8	12	105180	2.45
8	2-7/16	3-5/8	12	105191	2.45
9	2-7/16	3-5/8	12	105202	2.42
10	2-7/16	3-5/8	12	105213	2.21
11	2-5/16	3-1/2	12	105224	2.21
12	2-5/16	3-1/2	12	105235	2.21
13	2-5/16	3-1/2	12	105246	2.21
14	2-3/16	3-3/8	12	105257	2.09
15	2-3/16	3-3/8	12	105268	2.09
16	2-3/16	3-3/8	12	105279	2.09
17	2-3/16	3-3/8	12	105290	2.00
18	2-1/8	3-1/4	12	105301	2.00
19	2-1/8	3-1/4	12	105312	2.00
20	2-1/8	3-1/4	12	105323	1.79
21	2-1/8	3-1/4	12	105334	1.79
22	2	3-1/8	12	105345	1.73
23	2	3-1/8	12	105356	1.73
24	2	3-1/8	12	105367	1.73
25	1-7/8	3	12	105378	1.48
26	1-7/8	3	12	105389	1.48
27	1-7/8	3	12	105400	1.48

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
28	1-3/4	2-7/8	12	105411	1.36
29	1-3/4	2-7/8	12	105422	1.36
30	1-5/8	2-3/4	12	105433	1.33
31	1-5/8	2-3/4	12	105444	1.30
32	1-5/8	2-3/4	12	105455	1.30
33	1-1/2	2-5/8	12	105466	1.30
34	1-1/2	2-5/8	12	105477	1.30
35	1-1/2	2-5/8	12	105488	1.30
36	1-7/16	2-1/2	12	105499	1.30
37	1-7/16	2-1/2	12	105510	1.30
38	1-7/16	2-1/2	12	105521	1.30
39	1-3/8	2-3/8	12	105532	1.30
40	1-3/8	2-3/8	12	105543	1.30
41	1-3/8	2-3/8	12	105554	1.30
42	1-1/4	2-1/4	12	105565	1.30
43	1-1/4	2-1/4	12	105576	1.30
44	1-1/8	2-1/8	12	105587	1.30
45	1-1/8	2-1/8	12	105598	1.36
46	1-1/8	2-1/8	12	105609	1.36
47	1	2	12	105620	1.36
48	1	2	12	105631	1.36
49	1	2	12	105642	1.36
50	1	2	12	105653	1.36
51	1	2	12	105664	1.36
52	7/8	1-7/8	12	105675	1.36
53	7/8	1-7/8	12	105686	1.36
54	7/8	1-7/8	12	105697	1.45

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
55	7/8	1-7/8	12	105708	1.45
56	3/4	1-3/4	12	105719	1.45
57	3/4	1-3/4	12	105730	1.61
58	11/16	1-5/8	12	105741	1.61
59	11/16	1-5/8	12	105752	1.61
60	11/16	1-5/8	12	105763	1.61
61	11/16	1-5/8	12	105774	1.87
62	5/8	1-1/2	12	105785	1.87
63	5/8	1-1/2	12	105796	1.87
64	5/8	1-1/2	12	105807	1.87
65	5/8	1-1/2	12	105818	1.87
66	1/2	1-3/8	12	105829	1.87
67	1/2	1-3/8	12	105840	1.87
68	1/2	1-3/8	12	105851	1.87
69	1/2	1-3/8	12	105862	1.87
70	3/8	1-1/4	12	105873	1.87
71	3/8	1-1/4	12	105884	1.87
72	5/16	1-1/8	12	105895	1.87
73	5/16	1-1/8	12	105906	2.43
74	1/4	1	12	105917	2.43
75	1/4	1	12	105928	2.43
76	3/16	7/8	12	105939	2.43
77	3/16	7/8	12	105950	2.77
78	3/16	7/8	12	105961	2.77
79	1/8	3/4	12	105972	2.77
80	1/8	3/4	12	105983	2.77
-	-	-	-	-	-

# High Speed Steel Drills



## JOBBER LENGTH - 118° POINT



OXIDE FINISH

METRIC SIZES						METRIC SIZES					
SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE	SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1.00	12	34	12	215037	1.86	5.20	52	86	12	215664	3.50
1.05	12	34	12	215048	2.06	5.30	52	86	12	215675	3.60
1.10	14	36	12	215059	1.96	5.40	57	93	12	215686	3.85
1.15	14	36	12	215070	1.99	5.50	57	93	12	215697	3.40
1.20	16	38	12	215081	1.96	5.60	57	93	12	215708	4.02
1.25	16	38	12	215092	1.99	5.70	57	93	12	215719	4.05
1.30	16	38	12	215103	1.96	5.80	57	93	12	215730	4.14
1.35	18	40	12	215114	2.06	5.90	57	93	12	215741	4.14
1.40	18	40	12	215125	1.96	6.00	57	93	12	215752	3.69
1.45	18	40	12	215136	2.06	6.10	63	101	12	215763	4.37
1.50	18	40	12	215147	1.96	6.20	63	101	12	215774	4.59
1.55	20	43	12	215158	2.06	6.30	63	101	12	215785	4.63
1.60	20	43	12	215169	1.96	6.40	63	101	6	215796	4.82
1.65	20	43	12	215180	1.99	6.50	63	101	6	215807	4.72
1.70	20	43	12	215191	1.99	6.60	63	101	6	215818	5.01
1.75	22	46	12	215202	2.06	6.70	63	101	6	215829	5.11
1.80	22	46	12	215213	1.99	6.80	69	109	6	215840	5.20
1.85	22	46	12	215224	2.06	6.90	69	109	6	215851	5.59
1.90	22	46	12	215235	1.99	7.00	69	109	6	215862	4.91
1.95	24	49	12	215246	2.06	7.10	69	109	6	215873	5.75
2.00	24	49	12	215257	1.99	7.20	69	109	6	215884	5.85
2.05	24	49	12	215268	2.06	7.30	69	109	6	215895	6.14
2.10	24	49	12	215279	2.06	7.40	69	109	6	215906	6.23
2.15	27	53	12	215290	2.09	7.50	69	109	6	215917	5.85
2.20	27	53	12	215301	2.06	7.60	75	117	6	215928	6.52
2.25	27	53	12	215312	2.15	7.70	75	117	6	215939	6.78
2.30	27	53	12	215323	2.06	7.80	75	117	6	215950	6.97
2.35	27	53	12	215334	2.25	7.90	75	117	6	215961	7.00
2.40	30	57	12	215345	2.09	8.00	75	117	6	215972	6.42
2.45	30	57	12	215356	2.34	8.10	75	117	6	215983	7.00
2.50	30	57	12	215367	2.09	8.20	75	117	6	215994	7.20
2.60	30	57	12	215378	2.28	8.30	75	117	6	216005	7.36
2.70	33	61	12	215389	2.28	8.40	75	117	6	216016	7.55
2.80	33	61	12	215400	2.34	8.50	75	117	6	216027	7.36
2.90	33	61	12	215411	2.34	8.60	81	125	6	216038	7.84
3.00	33	61	12	215422	2.18	8.70	81	125	6	216049	8.03
3.10	36	65	12	215433	2.47	8.80	81	125	6	216060	8.13
3.20	36	65	12	215444	2.63	8.90	81	125	6	216071	8.58
3.30	36	65	12	215455	2.47	9.00	81	125	6	216082	8.29
3.40	39	70	12	215466	2.54	9.10	81	125	6	216093	9.03
3.50	39	70	12	215477	2.28	9.20	81	125	6	216104	9.22
3.60	39	70	12	215488	2.67	9.30	81	125	6	216115	9.35
3.70	39	70	12	215499	2.73	9.40	81	125	6	216126	9.35
3.80	43	75	12	215510	2.79	9.50	81	125	6	216137	8.67
3.90	43	75	12	215521	2.83	9.60	87	133	6	216148	9.41
4.00	43	75	12	215532	2.38	9.70	87	133	6	216159	9.70
4.10	43	75	12	215543	2.89	9.80	87	133	6	216170	9.70
4.20	43	75	12	215554	2.89	9.90	87	133	6	216181	9.80
4.30	47	80	12	215565	2.92	10.00	87	133	6	216192	9.32
4.40	47	80	12	215576	3.12	10.20	87	133	6	216203	10.09
4.50	47	80	12	215587	2.67	10.50	87	133	6	216214	10.60
4.60	47	80	12	215598	3.21	11.00	94	142	6	216225	10.89
4.70	47	80	12	215609	2.92	11.20	94	142	6	216236	12.43
4.80	52	86	12	215620	3.21	11.50	94	142	6	216247	12.24
4.90	52	86	12	215631	3.31	12.00	101	151	6	216258	13.49
5.00	52	86	12	215642	3.02	12.50	101	151	6	216269	13.78
5.10	52	86	12	215653	3.50	13.00	101	151	6	216280	22.84

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

HSS JOBBER DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# High Speed Steel Drills

## JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "B"



OXIDE FINISH

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

**HSS JOBBER DRILLS**

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	107798	1.42
5/64	1	2	12	107809	1.42
3/32	1-1/4	2-1/4	12	107820	1.42
7/64	1-1/2	2-5/8	12	107831	1.42
1/8	1-5/8	2-3/4	12	107842	1.42
9/64	1-3/4	2-7/8	12	107853	1.55
5/32	2	3-1/8	12	107864	1.88
11/64	2-1/8	3-1/4	12	107875	2.00
3/16	2-5/16	3-1/2	12	107886	2.27
13/64	2-7/16	3-5/8	12	107897	2.45

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
7/32	2-1/2	3-3/4	12	107908	2.70
15/64	2-5/8	3-7/8	12	107919	2.94
1/4	2-3/4	4	12	107930	3.12
17/64	2-7/8	4-1/8	6	107941	4.30
9/32	2-15/16	4-1/4	6	107952	4.67
19/64	3-1/16	4-3/8	6	107963	5.15
5/16	3-3/16	4-1/2	6	107974	5.30
21/64	3-5/16	4-5/8	6	107985	6.00
11/32	3-7/16	4-3/4	6	107996	6.36
23/64	3-1/2	4-7/8	6	108007	6.70

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/8	3-5/8	5	6	108018	7.30
25/64	3-3/4	5-1/8	6	108029	7.94
13/32	3-7/8	5-1/4	6	108040	8.61
27/64	3-15/16	5-3/8	6	108051	9.27
7/16	4-1/16	5-1/2	6	108062	10.06
29/64	4-3/16	5-5/8	6	108073	10.73
15/32	4-5/16	5-3/4	6	108084	11.67
31/64	4-3/8	5-7/8	6	108095	12.33
1/2	4-1/2	6	6	108106	12.97
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	108777	3.36
B	2-3/4	4	12	108788	3.36
C	2-3/4	4	12	108799	3.36
D	2-3/4	4	12	108810	3.36
E	2-3/4	4	12	108821	3.36
F	2-7/8	4-1/8	6	108832	4.27
G	2-7/8	4-1/8	6	108843	4.27
H	2-7/8	4-1/8	6	108854	4.27
I	2-7/8	4-1/8	6	108865	4.27

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	108876	5.18
K	2-15/16	4-1/4	6	108887	5.18
L	2-15/16	4-1/4	6	108898	5.18
M	3-1/16	4-3/8	6	108909	6.36
N	3-1/16	4-3/8	6	108920	6.36
O	3-3/16	4-1/2	6	108931	6.36
P	3-5/16	4-5/8	6	108942	7.18
Q	3-7/16	4-3/4	6	108953	7.18
R	3-7/16	4-3/4	6	108964	7.18

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	108975	8.18
T	3-1/2	4-7/8	6	108986	8.18
U	3-5/8	5	6	108997	8.70
V	3-5/8	5	6	109008	8.70
W	3-3/4	5-1/8	6	109019	9.88
X	3-3/4	5-1/8	6	109030	9.88
Y	3-7/8	5-1/4	6	109041	10.76
Z	3-7/8	5-1/4	6	109052	10.76
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	108117	2.91
2	2-5/8	3-7/8	12	108128	2.91
3	2-1/2	3-3/4	12	108139	2.70
4	2-1/2	3-3/4	12	108150	2.70
5	2-1/2	3-3/4	12	108161	2.70
6	2-1/2	3-3/4	12	108172	2.70
7	2-7/16	3-5/8	12	108183	2.55
8	2-7/16	3-5/8	12	108194	2.58
9	2-7/16	3-5/8	12	108205	2.58
10	2-7/16	3-5/8	12	108216	2.33
11	2-5/16	3-1/2	12	108227	2.33
12	2-5/16	3-1/2	12	108238	2.33
13	2-5/16	3-1/2	12	108249	2.58
14	2-3/16	3-3/8	12	108260	2.58
15	2-3/16	3-3/8	12	108271	2.58
16	2-3/16	3-3/8	12	108282	2.58
17	2-3/16	3-3/8	12	108293	2.58
18	2-1/8	3-1/4	12	108304	2.58
19	2-1/8	3-1/4	12	108315	2.45
20	2-1/8	3-1/4	12	108326	2.45

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
21	2-1/8	3-1/4	12	108337	2.30
22	2	3-1/8	12	108348	2.30
23	2	3-1/8	12	108359	2.30
24	2	3-1/8	12	108370	2.30
25	1-7/8	3	12	108381	2.30
26	1-7/8	3	12	108392	2.30
27	1-7/8	3	12	108403	2.30
28	1-3/4	2-7/8	12	108414	2.30
29	1-3/4	2-7/8	12	108425	1.85
30	1-5/8	2-3/4	12	108436	1.85
31	1-5/8	2-3/4	12	108447	2.03
32	1-5/8	2-3/4	12	108458	2.03
33	1-1/2	2-5/8	12	108469	2.03
34	1-1/2	2-5/8	12	108480	2.03
35	1-1/2	2-5/8	12	108491	2.03
36	1-7/16	2-1/2	12	108502	2.03
37	1-7/16	2-1/2	12	108513	2.03
38	1-7/16	2-1/2	12	108524	2.03
39	1-3/8	2-1/8	12	108535	2.03
40	1-3/8	2-3/8	12	108546	2.03

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
41	1-3/8	2-3/8	12	108557	1.94
42	1-1/4	2-1/4	12	108568	1.94
43	1-1/4	2-1/4	12	108579	1.94
44	1-1/8	2-1/8	12	108590	1.94
45	1-1/8	2-1/8	12	108601	1.94
46	1-1/8	2-1/8	12	108612	1.94
47	1	2	12	108623	1.94
48	1	2	12	108634	1.94
49	1	2	12	108645	1.94
50	1	2	12	108656	1.94
51	1	2	12	108667	1.94
52	7/8	1-7/8	12	108678	1.94
53	7/8	1-7/8	12	108689	1.94
54	7/8	1-7/8	12	108700	1.94
55	7/8	1-7/8	12	108711	1.94
56	3/4	1-3/4	12	108722	1.94
57	3/4	1-3/4	12	108733	1.94
58	11/16	1-5/8	12	108744	1.94
59	11/16	1-5/8	12	108755	1.94
60	11/16	1-5/8	12	108766	1.94

# High Speed Steel Drills



## JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "B"



BLACK & GOLD

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
1/16	7/8	1-7/8	12	109063	1.64	7/32	2-1/2	3-3/4	12	109173	3.27	3/8	3-5/8	5	6	109283	8.33	
5/64	1	2	12	109074	1.79	15/64	2-5/8	3-7/8	12	109184	3.61	25/64	3-3/4	5-1/8	6	109294	9.06	
3/32	1-1/4	2-1/4	12	109085	1.64	1/4	2-3/4	4	12	109195	3.79	13/32	3-7/8	5-1/4	6	109305	9.97	
7/64	1-1/2	2-5/8	12	109096	1.70	17/64	2-7/8	4-1/8	6	109206	5.09	27/64	3-15/16	5-3/8	6	109316	10.64	
1/8	1-5/8	2-3/4	12	109107	1.88	9/32	2-15/16	4-1/4	6	109217	5.48	7/16	4-1/16	5-1/2	6	109327	11.45	
9/64	1-3/4	2-7/8	12	109118	1.97	19/64	3-1/16	4-3/8	6	109228	6.03	29/64	4-3/16	5-5/8	6	109338	12.18	
5/32	2	3-1/8	12	109129	2.36	5/16	3-3/16	4-1/2	6	109239	6.24	15/32	4-5/16	5-3/4	6	109349	13.24	
11/64	2-1/8	3-1/4	12	109140	2.48	21/64	3-5/16	4-5/8	6	109250	6.88	31/64	4-3/8	5-7/8	6	109360	13.97	
3/16	2-5/16	3-1/2	12	109151	2.76	11/32	3-7/16	4-3/4	6	109261	7.36	1/2	4-1/2	6	6	109371	14.61	
13/64	2-7/16	3-5/8	12	109162	3.00	23/64	3-1/2	4-7/8	6	109272	7.97	-	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
A	2-5/8	3-7/8	12	110042	3.91	J	2-7/8	4-1/8	6	110141	4.82	S	3-1/2	4-7/8	6	110240	6.82	
B	2-3/4	4	12	110053	3.91	K	2-15/16	4-1/4	6	110152	5.27	T	3-1/2	4-7/8	6	110251	7.15	
C	2-3/4	4	12	110064	3.91	L	2-15/16	4-1/4	6	110163	5.58	U	3-5/8	5	6	110262	7.36	
D	2-3/4	4	12	110075	3.91	M	3-1/16	4-3/8	6	110174	5.58	V	3-5/8	5	6	110273	7.58	
E	2-3/4	4	12	110086	3.79	N	3-1/16	4-3/8	6	110185	5.58	W	3-3/4	5-1/8	6	110284	7.64	
F	2-7/8	4-1/8	6	110097	4.03	O	3-3/16	4-1/2	6	110196	5.85	X	3-3/4	5-1/8	6	110295	8.39	
G	2-7/8	4-1/8	6	110108	4.45	P	3-5/16	4-5/8	6	110207	6.12	Y	3-7/8	5-1/4	6	110306	8.76	
H	2-7/8	4-1/8	6	110119	4.64	Q	3-7/16	4-3/4	6	110218	6.24	Z	3-7/8	5-1/4	6	110317	9.21	
I	2-7/8	4-1/8	6	110130	4.64	R	3-7/16	4-3/4	6	110229	6.58	-	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	109382	3.64	21	2-1/8	3-1/4	12	109602	3.06	41	1-3/8	2-3/8	12	109822	2.36
2	2-5/8	3-7/8	12	109393	3.76	22	2	3-1/8	12	109613	3.06	42	1-1/4	2-1/4	12	109833	2.36
3	2-1/2	3-3/4	12	109404	3.79	23	2	3-1/8	12	109624	2.97	43	1-1/4	2-1/4	12	109844	2.36
4	2-1/2	3-3/4	12	109415	3.79	24	2	3-1/8	12	109635	2.97	44	1-1/8	2-1/8	12	109855	2.36
5	2-1/2	3-3/4	12	109426	3.79	25	1-7/8	3	12	109646	2.97	45	1-1/8	2-1/8	12	109866	2.36
6	2-1/2	3-3/4	12	109437	3.79	26	1-7/8	3	12	109657	2.97	46	1-1/8	2-1/8	12	109877	2.36
7	2-7/16	3-5/8	12	109448	3.36	27	1-7/8	3	12	109668	2.88	47	1	2	12	109888	2.36
8	2-7/16	3-5/8	12	109459	3.36	28	1-3/4	2-7/8	12	109679	2.88	48	1	2	12	109899	2.36
9	2-7/16	3-5/8	12	109470	3.36	29	1-3/4	2-7/8	12	109690	2.82	49	1	2	12	109910	2.36
10	2-7/16	3-5/8	12	109481	3.36	30	1-5/8	2-3/4	12	109701	2.45	50	1	2	12	109921	2.36
11	2-5/16	3-1/2	12	109492	3.36	31	1-5/8	2-3/4	12	109712	2.45	51	1	2	12	109932	2.36
12	2-5/16	3-1/2	12	109503	3.36	32	1-5/8	2-3/4	12	109723	2.45	52	7/8	1-7/8	12	109943	2.21
13	2-5/16	3-1/2	12	109514	3.36	33	1-1/2	2-5/8	12	109734	2.45	53	7/8	1-7/8	12	109954	2.21
14	2-3/16	3-3/8	12	109525	3.18	34	1-1/2	2-5/8	12	109745	2.45	54	7/8	1-7/8	12	109965	2.21
15	2-3/16	3-3/8	12	109536	3.18	35	1-1/2	2-5/8	12	109756	2.45	55	7/8	1-7/8	12	109976	2.21
16	2-3/16	3-3/8	12	109547	3.18	36	1-7/16	2-1/2	12	109767	2.36	56	3/4	1-3/4	12	109987	2.21
17	2-3/16	3-3/8	12	109558	3.18	37	1-7/16	2-1/2	12	109778	2.36	57	3/4	1-3/4	12	109998	2.21
18	2-1/8	3-1/4	12	109569	3.18	38	1-7/16	2-1/2	12	109789	2.36	58	11/16	1-5/8	12	110009	2.21
19	2-1/8	3-1/4	12	109580	3.06	39	1-3/8	2-1/2	12	109800	2.36	59	11/16	1-5/8	12	110020	2.21
20	2-1/8	3-1/4	12	109591	3.06	40	1-3/8	2-3/8	12	109811	2.36	60	11/16	1-5/8	12	110031	2.21

HSS JOBBER DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# High Speed Steel Drills

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



BLACK & GOLD

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OVERALL LENGTH	PACKAGE QUANTITY	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	110328	1.94
5/64	1	2	12	110339	2.09
3/32	1-1/4	2-1/4	12	110350	2.09
7/64	1-5/16	2-3/8	12	110361	2.15
1/8	1-7/16	2-1/2	12	110372	2.24
9/64	1-9/16	2-5/8	12	110383	2.30
5/32	1-11/16	2-3/4	12	110394	2.76
11/64	1-13/16	2-7/8	12	110405	2.82
3/16	1-7/8	3	12	110416	3.21
13/64	1-15/16	3-1/8	12	110427	3.48
7/32	2	3-1/4	12	110438	3.88
15/64	2-1/16	3-3/8	12	110449	4.15
1/4	2	3-1/2	12	110460	4.39
17/64	2-1/8	3-5/8	6	110471	5.52
9/32	2-1/4	3-3/4	6	110482	5.52
19/64	2-3/8	3-7/8	6	110493	6.55
5/16	2-1/2	4	6	110504	7.00
21/64	2-9/16	4-1/16	6	110515	7.45
11/32	2-5/8	4-1/8	6	110526	8.12
23/64	2-11/16	4-3/16	6	110537	8.64
3/8	2-11/16	4-1/4	6	110548	9.15
25/64	2-3/4	4-5/16	6	110559	9.73
13/32	2-13/16	4-3/8	6	110570	10.48
27/64	2-7/8	4-7/16	6	110581	11.82
7/16	2-15/16	4-1/2	6	110592	12.48
29/64	3	4-5/8	6	110603	13.61
15/32	3-1/8	4-3/4	6	110614	14.58
31/64	3-1/4	4-7/8	6	110625	14.88
1/2	3-3/8	5	6	110636	15.27

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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT ENDMILLS  
 HSS & COBALT REAMERS

HSS MECHANICS LENGTH DRILLS

# High Speed Steel Drills



## SCREW MACHINE LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "C"



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	5/8	1-5/8	12	102100	1.67	7/32	1-1/4	2-3/8	12	102210	2.52	3/8	1-13/16	3-1/8	6	102320	5.58
5/64	11/16	1-11/16	12	102111	1.70	15/64	1-5/16	2-7/16	12	102221	2.91	25/64	1-7/8	3-1/4	6	102331	5.91
3/32	3/4	1-3/4	12	102122	1.70	1/4	1-3/8	2-1/2	12	102232	3.21	13/32	1-15/16	3-5/16	6	102342	6.48
7/64	13/16	1-13/16	12	102133	1.70	17/64	1-7/16	2-5/8	6	102243	3.30	27/64	2	3-3/8	6	102353	6.85
1/8	7/8	1-7/8	12	102144	1.70	9/32	1-1/2	2-11/16	6	102254	3.48	7/16	1-1/16	3-7/16	6	102364	7.48
9/64	15/16	1-15/16	12	102155	1.70	19/64	1-9/16	2-3/4	6	102265	3.79	29/64	2-1/8	3-9/16	6	102375	7.94
5/32	1	2-1/16	12	102166	1.85	5/16	1-5/8	2-13/16	6	102276	4.03	15/32	2-1/8	3-5/8	6	102386	8.73
11/64	1-1/16	2-1/8	12	102177	1.85	21/64	1-11/16	2-15/16	6	102287	4.52	31/64	2-3/16	3-11/16	6	102397	9.06
3/16	1-1/8	2-3/16	12	102188	2.15	11/32	1-11/16	3	6	102298	4.82	1/2	2-1/4	3-3/4	6	102408	9.55
13/64	1-3/16	2-1/4	12	102199	2.21	23/64	1-3/4	3-1/16	6	102309	5.12	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	1-5/16	2-7/16	12	103079	3.48	J	1-1/2	2-11/16	6	103178	5.39	S	1-3/4	3-1/16	6	103277	7.88
B	1-3/8	2-1/2	12	103090	3.67	K	1-1/2	2-11/16	6	103189	5.48	T	1-3/4	3-1/16	6	103288	8.06
C	1-3/8	2-1/2	12	103101	3.67	L	1-9/16	2-3/4	6	103200	5.61	U	1-13/16	3-1/8	6	103299	8.70
D	1-3/8	2-1/2	12	103112	3.70	M	1-9/16	2-3/4	6	103211	5.88	V	1-7/8	3-1/4	6	103310	9.24
E	1-3/8	2-1/2	12	103123	3.70	N	1-5/8	2-13/16	6	103222	6.12	W	1-7/8	3-1/4	6	103321	9.58
F	1-7/16	2-5/8	6	103134	4.76	O	1-11/16	2-15/16	6	103233	6.88	X	1-15/16	3-5/16	6	103332	10.15
G	1-7/16	2-5/8	6	103145	5.09	P	1-11/16	2-15/16	6	103244	7.06	Y	1-15/16	3-5/16	6	103343	10.36
H	1-1/2	2-11/16	6	103156	5.24	Q	1-11/16	3	6	103255	7.36	Z	2	3-3/8	6	103354	10.73
I	1-1/2	2-11/16	6	103167	5.27	R	1-11/16	3	6	103266	7.58	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	1-5/16	2-7/16	12	102419	2.91	21	1-1/16	2-1/8	12	102639	2.45	41	13/16	1-13/16	12	102859	1.88
2	1-5/16	2-7/16	12	102430	2.91	22	1-1/16	2-1/8	12	102650	2.39	42	3/4	1-3/4	12	102870	1.88
3	1-1/4	2-3/8	12	102441	3.00	23	1	2-1/16	12	102661	2.39	43	3/4	1-3/4	12	102881	1.88
4	1-1/4	2-3/8	12	102452	3.00	24	1	2-1/16	12	102672	2.39	44	3/4	1-3/4	12	102892	1.88
5	1-1/4	2-3/8	12	102463	3.00	25	1	2-1/16	12	102683	2.39	45	3/4	1-3/4	12	102903	1.88
6	1-1/4	2-3/8	12	102474	3.00	26	1	2-1/16	12	102694	2.39	46	3/4	1-3/4	12	102914	1.88
7	1-3/16	2-1/4	12	102485	2.58	27	1	2-1/16	12	102705	2.39	47	11/16	1-11/16	12	102925	1.88
8	1-3/16	2-1/4	12	102496	2.58	28	15/16	1-15/16	12	102716	2.39	48	11/16	1-11/16	12	102936	1.88
9	1-3/16	2-1/4	12	102507	2.58	29	15/16	1-15/16	12	102727	2.39	49	11/16	1-11/16	12	102947	1.88
10	1-3/16	2-1/4	12	102518	2.58	30	15/16	1-15/16	12	102738	1.88	50	11/16	1-11/16	12	102958	1.88
11	1-3/16	2-1/4	12	102529	2.58	31	7/8	1-7/8	12	102749	1.88	51	11/16	1-11/16	12	102969	1.88
12	1-3/16	2-1/4	12	102540	2.58	32	7/8	1-7/8	12	102760	1.88	52	11/16	1-11/16	12	102980	1.88
13	1-1/8	2-3/16	12	102551	2.58	33	7/8	1-7/8	12	102771	1.88	53	5/8	1-5/8	12	102991	1.88
14	1-1/8	2-3/16	12	102562	2.58	34	7/8	1-7/8	12	102782	1.88	54	5/8	1-5/8	12	103002	1.88
15	1-1/8	2-3/16	12	102573	2.58	35	7/8	1-7/8	12	102793	1.88	55	5/8	1-5/8	12	103013	1.88
16	1-1/8	2-3/16	12	102584	2.58	36	13/16	1-13/16	12	102804	1.88	56	1/2	1-3/8	12	103024	1.88
17	1-1/8	2-3/16	12	102595	2.58	37	13/16	1-13/16	12	102815	1.88	57	1/2	1-3/8	12	103035	1.88
18	1-1/16	2-1/8	12	102606	2.45	38	13/16	1-13/16	12	102826	1.88	58	1/2	1-3/8	12	103046	1.88
19	1-1/16	2-1/8	12	102617	2.45	39	13/16	1-13/16	12	102837	1.88	59	1/2	1-3/8	12	103057	1.88
20	1-1/16	2-1/8	12	102628	2.45	40	13/16	1-13/16	12	102848	1.88	60	1/2	1-3/8	12	103068	1.88

HSS SCREW MACHINE DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT REAMERS

HSS & COBALT ENDMILLS



# High Speed Steel Drills

## TAPER LENGTH - 118° POINT



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/64	1-1/8	2-1/4	12	113683	4.75	15/32	4-3/4	7-1/2	6	113980	29.39	57/64	6-1/8	10	1	114277	107.38
1/16	1-3/4	3-3/4	12	113694	5.11	31/64	4-3/4	7-3/4	6	113991	31.09	29/32	6-1/8	10	1	114288	107.38
5/64	2	3-3/4	12	113705	5.94	1/2	4-3/4	7-3/4	6	114002	31.09	59/64	6-1/8	10-3/4	1	114299	116.73
3/32	2-1/4	4-1/4	12	113716	7.10	33/64	4-3/4	8	1	114013	41.31	15/16	6-1/8	10-3/4	1	114310	116.73
7/64	2-1/2	4-5/8	12	113727	8.93	17/32	4-3/4	8	1	114024	41.31	61/64	6-3/8	11	1	114321	128.84
1/8	2-3/4	5-1/8	12	113738	9.19	35/64	4-7/8	8-1/4	1	114035	43.40	31/32	6-3/8	11	1	114332	128.84
9/64	3	5-3/8	12	113749	12.27	9/16	4-7/8	8-1/4	1	114046	43.40	63/64	6-3/8	11	1	114343	134.30
5/32	3	5-3/8	12	113760	12.40	37/64	4-7/8	8-3/4	1	114057	50.78	1	6-3/8	11	1	114354	134.30
11/64	3-3/8	5-3/4	12	113771	13.01	19/32	4-7/8	8-3/4	1	114068	50.78	1-1/32	6-1/2	11-1/8	1	114365	160.86
3/16	3-3/8	5-3/4	12	113782	12.11	39/64	4-7/8	8-3/4	1	114079	52.61	1-1/16	6-5/8	11-1/4	1	114376	166.42
13/64	3-5/8	6	12	113793	14.78	5/8	4-7/8	8-3/4	1	114090	52.61	1-3/32	6-7/8	11-1/2	1	114387	178.50
7/32	3-5/8	6	12	113804	15.93	41/64	5-1/8	9	1	114101	59.91	1-1/8	7-1/8	11-3/4	1	114398	185.24
15/64	3-3/4	6-1/8	12	113815	15.93	21/32	5-1/8	9	1	114112	59.91	1-5/32	7-1/4	11-7/8	1	114409	201.62
1/4	3-3/4	6-1/8	12	113826	13.75	43/64	5-3/8	9-1/4	1	114123	70.86	1-3/16	7-3/8	12	1	114420	217.11
17/64	3-7/8	6-1/4	6	113837	16.67	11/16	5-3/8	9-1/4	1	114134	70.86	1-7/32	7-1/2	12-1/8	1	114431	223.56
9/32	3-7/8	6-1/4	6	113848	16.67	45/64	5-5/8	9-1/2	1	114145	74.10	1-1/4	7-7/8	12-1/2	1	114442	232.53
19/64	4	6-3/8	6	113859	18.15	23/32	5-5/8	9-1/2	1	114156	74.10	1-9/32	8-1/2	14-1/8	1	114453	277.46
5/16	4	6-3/8	6	113870	18.15	47/64	5-7/8	9-3/4	1	114167	79.69	1-5/16	8-5/8	14-1/4	1	114464	277.46
21/64	4-1/8	6-1/2	6	113881	18.15	3/4	5-7/8	9-3/4	1	114178	79.69	1-11/32	8-3/4	14-3/8	1	114475	297.57
11/32	4-1/8	6-1/2	6	113892	18.15	49/64	6	9-7/8	1	114189	86.34	1-3/8	8-7/8	14-1/2	1	114486	297.57
23/64	4-1/4	6-3/4	6	113903	21.39	25/32	6	9-7/8	1	114200	86.34	1-13/32	9	14-5/8	1	114497	338.88
3/8	4-1/4	6-3/4	6	113914	21.39	51/64	6-1/8	10	1	114211	93.22	1-7/16	9-1/8	14-3/4	1	114508	353.62
25/64	4-3/8	6-3/4	6	113925	24.35	13/16	6-1/8	10	1	114222	93.22	1-15/32	9-1/4	14-7/8	1	114519	363.52
13/32	4-3/8	7	6	113936	24.35	53/64	6-1/8	10	1	114233	98.16	1-1/2	9-3/8	15	1	114530	363.52
27/64	4-5/8	7-1/4	6	113947	25.83	27/32	6-1/8	10	1	114244	98.16	1-9/16	9-5/8	15-1/4	1	114541	406.75
7/16	4-5/8	7-1/4	6	113958	25.83	55/64	6-1/8	10	1	114255	103.01	1-5/8	9-7/8	15-5/8	1	114552	459.33
29/64	4-3/4	7-1/2	6	113969	29.39	7/8	6-1/8	10	1	114266	103.01	1-3/4	10-1/2	16-1/4	1	114563	553.45

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	3-3/4	6-1/8	12	114574	16.70	15	3-3/8	5-3/4	12	114728	14.68	29	3	5-3/8	12	114882	14.68
2	3-3/4	6-1/8	12	114585	16.70	16	3-3/8	5-3/4	12	114739	14.68	30	3	5-3/8	12	114893	14.68
3	3-5/8	6	12	114596	16.16	17	3-3/8	5-3/4	12	114750	14.68	31	2-3/4	5-1/8	12	114904	14.39
4	3-5/8	6	12	114607	16.16	18	3-3/8	5-3/4	12	114761	14.68	32	2-3/4	5-1/8	12	114915	14.39
5	3-5/8	6	12	114618	16.16	19	3-3/8	5-3/4	12	114772	14.68	33	2-3/4	5-1/8	12	114926	14.39
6	3-5/8	6	12	114629	16.16	20	3-3/8	5-3/4	12	114783	14.68	34	2-3/4	5-1/8	12	114937	14.39
7	3-5/8	6	12	114640	16.16	21	3-3/8	5-3/4	12	114794	14.68	35	2-3/4	5-1/8	12	114948	14.39
8	3-5/8	6	12	114651	16.16	22	3-3/8	5-3/4	12	114805	14.68	36	2-1/2	4-5/8	12	114959	10.76
9	3-5/8	6	12	114662	16.16	23	3	5-3/8	12	114816	14.68	37	2-1/2	4-5/8	12	114970	10.76
10	3-5/8	6	12	114673	16.16	24	3	5-3/8	12	114827	14.68	38	2-1/2	4-5/8	12	114981	10.76
11	3-5/8	6	12	114684	16.16	25	3	5-3/8	12	114838	14.68	39	2-1/2	4-5/8	12	114992	9.44
12	3-5/8	6	12	114695	16.16	26	3	5-3/8	12	114849	14.68	40	2-1/2	4-5/8	12	115003	9.44
13	3-3/8	5-3/4	12	114706	14.68	27	3	5-3/8	12	114860	14.68	-	-	-	-	-	-
14	3-3/8	5-3/4	12	114717	14.68	28	3	5-3/8	12	114871	14.68	-	-	-	-	-	-

# High Speed Steel Drills



## TAPER SHANK - 118° POINT



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	MORSE TAPER #	FLUTE LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE	SIZE	MORSE TAPER #	FLUTE LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
3/16	#1	2-1/2	5-3/4	115201	32.47	13/16	#3	6-1/8	10-3/4	115641	108.86
13/64	#1	2-3/4	6	115212	32.47	53/64	#3	6-1/8	10-3/4	115652	120.58
7/32	#1	2-3/4	6	115223	32.47	27/32	#3	6-1/8	10-3/4	115663	117.34
15/64	#1	2-7/8	6-1/8	115234	32.47	55/64	#3	6-1/8	10-3/4	115674	132.40
1/4	#1	2-7/8	6-1/8	115245	32.47	7/8	#3	6-1/8	10-3/4	115685	120.90
17/64	#1	3	6-1/4	115256	32.47	57/64	#3	6-1/8	10-3/4	115696	127.68
9/32	#1	3	6-1/4	115267	32.47	29/32	#3	6-1/8	10-3/4	115707	127.68
19/64	#1	3-1/8	6-3/8	115278	34.40	59/64	#3	6-1/8	10-3/4	115718	129.45
5/16	#1	3-1/8	6-3/8	115289	36.17	15/16	#3	6-1/8	10-3/4	115729	121.32
21/64	#1	3-1/4	6-1/2	115300	36.17	61/64	#3	6-3/8	11	115740	132.98
11/32	#1	3-1/4	6-1/2	115311	36.17	31/32	#3	6-3/8	11	115751	132.08
23/64	#1	3-1/2	6-3/4	115322	36.91	63/64	#3	6-3/8	11	115762	141.11
3/8	#1	3-1/2	6-3/4	115333	36.91	1	#3	6-3/8	11	115773	134.30
25/64	#1	3-5/8	7	115344	43.85	1-1/64	#3	6-1/2	11-1/8	115784	156.14
13/32	#1	3-5/8	7	115355	43.85	1-1/32	#3	6-1/2	11-1/8	115795	154.98
27/64	#1	3-7/8	7-1/4	115366	47.22	1-3/64	#3	6-5/8	11-1/4	115806	162.37
7/16	#1	3-7/8	7-1/4	115377	47.22	1-1/16	#3	6-5/8	11-1/4	115817	154.98
29/64	#1	4-1/8	7-1/2	115388	47.22	1-5/64	#4	6-7/8	12-1/2	115828	184.47
15/32	#2	4-1/8	7-1/2	115399	47.22	1-3/32	#4	6-7/8	12-1/2	115839	184.47
31/64	#2	4-3/8	8-1/4	115410	51.65	1-7/64	#4	7-1/8	12-3/4	115850	191.86
1/2	#2	4-3/8	8-1/4	115421	48.34	1-1/8	#4	7-1/8	12-3/4	115861	191.86
33/64	#2	4-5/8	8-1/2	115432	55.73	1-9/64	#4	7-1/4	12-7/8	115872	206.64
17/32	#2	4-5/8	8-1/2	115443	57.56	1-5/32	#4	7-1/4	12-7/8	115883	199.25
35/64	#2	4-7/8	8-3/4	115454	60.64	1-11/64	#4	7-3/8	13	115894	206.64
9/16	#2	4-7/8	8-3/4	115465	59.04	1-3/16	#4	7-3/8	13	115905	206.64
37/64	#2	4-7/8	8-3/4	115476	64.56	1-13/64	#4	7-1/2	13-1/8	115916	221.38
19/32	#2	4-7/8	8-3/4	115487	63.47	1-7/32	#4	7-1/2	13-1/8	115927	221.38
39/64	#2	4-7/8	8-3/4	115498	67.17	1-1/4	#4	7-7/8	13-1/2	115949	231.72
5/8	#2	4-7/8	8-3/4	115509	64.21	1-5/16	#4	8-5/8	14-1/4	115982	284.85
41/64	#2	5-1/8	9	115520	73.81	1-3/8	#4	8-7/8	14-1/2	116004	304.03
21/32	#2	5-1/8	9	115531	72.34	1-7/16	#4	9-1/8	14-3/4	116026	333.55
43/64	#2	5-3/8	9-1/4	115542	79.69	1-1/2	#4	9-3/8	15	116048	349.80
11/16	#2	5-3/8	9-1/4	115553	75.26	1-9/16	#5	9-5/8	16-5/8	116070	426.54
45/64	#2	5-5/8	9-1/2	115564	82.65	1-5/8	#5	10	17	116092	460.49
23/32	#2	5-5/8	9-1/2	115575	79.85	1-11/16	#5	10-1/8	17-1/8	116114	507.74
47/64	#2	5-7/8	9-3/4	115586	88.56	1-3/4	#5	10-1/8	17-1/8	116136	540.21
3/4	#2	5-7/8	9-3/4	115597	87.82	1-13/16	#5	10-1/8	17-1/8	116158	580.04
49/64	#2	6	9-7/8	115608	105.84	1-7/8	#5	10-3/8	17-3/8	116180	605.13
25/32	#2	6	9-7/8	115619	105.23	1-15/16	#5	10-3/8	17-3/8	116202	652.38
51/64	#3	6-1/8	10-3/4	115630	115.86	2	#5	10-3/8	17-3/8	116224	675.99

HSS TAPER SHANK DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT REAMERS

HSS & COBALT ENDMILLS



# M42 Cobalt Drills

## SCREW MACHINE LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"



NAS 907 - M42 COBALT  
STRAW FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	5/8	1-5/8	12	103365	2.06	7/32	1-1/4	2-3/8	12	103475	4.97	3/8	1-13/16	3-1/8	6	103585	11.79
5/64	11/16	1-11/16	12	103376	2.06	15/64	1-5/16	2-7/16	12	103486	5.33	25/64	1-7/8	3-1/4	6	103596	13.48
3/32	3/4	1-3/4	12	103387	2.06	1/4	1-3/8	2-1/2	12	103497	5.55	13/32	1-15/16	3-5/16	6	103607	13.94
7/64	13/16	1-13/16	12	103398	2.33	17/64	1-7/16	2-5/8	6	103508	6.33	27/64	2	3-3/8	6	103618	15.45
1/8	7/8	1-7/8	12	103409	2.70	9/32	1-1/2	2-11/16	6	103519	6.88	7/16	1-1/16	3-7/16	6	103629	15.88
9/64	15/16	1-15/16	12	103420	2.70	19/64	1-9/16	2-3/4	6	103530	7.97	29/64	2-1/8	3-9/16	6	103640	19.06
5/32	1	2-1/16	12	103431	2.97	5/16	1-5/8	2-13/16	6	103541	8.55	15/32	2-1/8	3-5/8	6	103651	19.06
11/64	1-1/16	2-1/8	12	103442	3.36	21/64	1-11/16	2-15/16	6	103552	9.48	31/64	2-3/16	3-11/16	6	103662	19.06
3/16	1-1/8	2-3/16	12	103453	3.94	11/32	1-11/16	3	6	103563	10.24	1/2	2-1/4	3-3/4	6	103673	19.06
13/64	1-3/16	2-1/4	12	103464	4.52	23/64	1-3/4	3-1/16	6	103574	11.79	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	1-5/16	2-7/16	12	104344	6.36	J	1-1/2	2-11/16	6	104443	7.58	S	1-3/4	3-1/16	6	104542	14.39
B	1-3/8	2-1/2	12	104355	6.76	K	1-1/2	2-11/16	6	104454	7.58	T	1-3/4	3-1/16	6	104553	14.39
C	1-3/8	2-1/2	12	104366	6.76	L	1-9/16	2-3/4	6	104465	9.00	U	1-13/16	3-1/8	6	104564	14.39
D	1-3/8	2-1/2	12	104377	6.76	M	1-9/16	2-3/4	6	104476	9.00	V	1-7/8	3-1/4	6	104575	16.00
E	1-3/8	2-1/2	12	104388	6.15	N	1-5/8	2-13/16	6	104487	9.67	W	1-7/8	3-1/4	6	104586	16.00
F	1-7/16	2-5/8	6	104399	7.15	O	1-11/16	2-15/16	6	104498	10.70	X	1-15/16	3-5/16	6	104597	16.00
G	1-7/16	2-5/8	6	104410	7.15	P	1-11/16	2-15/16	6	104509	10.70	Y	1-15/16	3-5/16	6	104608	16.00
H	1-1/2	2-11/16	6	104421	7.58	Q	1-11/16	3	6	104520	11.58	Z	2	3-3/8	6	104619	18.33
I	1-1/2	2-11/16	6	104432	7.58	R	1-11/16	3	6	104531	11.58	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	1-5/16	2-7/16	12	103684	6.12	21	1-1/16	2-1/8	12	103904	3.18	41	13/16	1-13/16	12	104124	2.15
2	1-5/16	2-7/16	12	103695	6.12	22	1-1/16	2-1/8	12	103915	3.18	42	3/4	1-3/4	12	104135	2.12
3	1-1/4	2-3/8	12	103706	6.12	23	1	2-1/16	12	103926	3.18	43	3/4	1-3/4	12	104146	2.12
4	1-1/4	2-3/8	12	103717	5.45	24	1	2-1/16	12	103937	3.18	44	3/4	1-3/4	12	104157	2.12
5	1-1/4	2-3/8	12	103728	5.45	25	1	2-1/16	12	103948	2.97	45	3/4	1-3/4	12	104168	2.12
6	1-1/4	2-3/8	12	103739	5.45	26	1	2-1/16	12	103959	2.97	46	3/4	1-3/4	12	104179	2.12
7	1-3/16	2-1/4	12	103750	4.30	27	1	2-1/16	12	103970	2.97	47	11/16	1-11/16	12	104190	2.12
8	1-3/16	2-1/4	12	103761	4.30	28	15/16	1-15/16	12	103981	2.70	48	11/16	1-11/16	12	104201	2.12
9	1-3/16	2-1/4	12	103772	4.30	29	15/16	1-15/16	12	103992	2.70	49	11/16	1-11/16	12	104212	2.12
10	1-3/16	2-1/4	12	103783	4.30	30	15/16	1-15/16	12	104003	2.55	50	11/16	1-11/16	12	104223	2.12
11	1-3/16	2-1/4	12	103794	4.18	31	7/8	1-7/8	12	104014	2.55	51	11/16	1-11/16	12	104234	2.12
12	1-3/16	2-1/4	12	103805	4.18	32	7/8	1-7/8	12	104025	2.55	52	11/16	1-11/16	12	104245	2.12
13	1-1/8	2-3/16	12	103816	4.09	33	7/8	1-7/8	12	104036	2.45	53	5/8	1-5/8	12	104256	2.39
14	1-1/8	2-3/16	12	103827	4.09	34	7/8	1-7/8	12	104047	2.45	54	5/8	1-5/8	12	104267	2.39
15	1-1/8	2-3/16	12	103838	4.09	35	7/8	1-7/8	12	104058	2.45	55	5/8	1-5/8	12	104278	2.39
16	1-1/8	2-3/16	12	103849	4.09	36	13/16	1-13/16	12	104069	2.45	56	1/2	1-3/8	12	104289	2.39
17	1-1/8	2-3/16	12	103860	3.94	37	13/16	1-13/16	12	104080	2.45	57	1/2	1-3/8	12	104300	2.39
18	1-1/16	2-1/8	12	103871	3.36	38	13/16	1-13/16	12	104091	2.24	58	1/2	1-3/8	12	104311	2.55
19	1-1/16	2-1/8	12	103882	3.18	39	13/16	1-13/16	12	104102	2.24	59	1/2	1-3/8	12	104322	2.55
20	1-1/16	2-1/8	12	103893	3.18	40	13/16	1-13/16	12	104113	2.24	60	1/2	1-3/8	12	104333	2.55

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
COBALT SCREW MACHINE DRILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

# M42 Cobalt Drills



**SCREW MACHINE LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"**



**NAS 907 - M42 COBALT  
ALTIN COATED**

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	5/8	1-5/8	12	233990	3.67	7/32	1-1/4	2-3/8	12	234100	8.82	3/8	1-13/16	3-1/8	6	234210	20.91
5/64	11/16	1-11/16	12	234001	3.67	15/64	1-5/16	2-7/16	12	234111	9.48	25/64	1-7/8	3-1/4	6	234221	23.94
3/32	3/4	1-3/4	12	234012	3.67	1/4	1-3/8	2-1/2	12	234122	9.85	13/32	1-15/16	3-5/16	6	234232	24.70
7/64	13/16	1-13/16	12	234023	4.15	17/64	1-7/16	2-5/8	6	234133	11.21	27/64	2	3-3/8	6	234243	27.36
1/8	7/8	1-7/8	12	234034	4.82	9/32	1-1/2	2-11/16	6	234144	12.21	7/16	1-1/16	3-7/16	6	234254	28.15
9/64	15/16	1-15/16	12	234045	4.82	19/64	1-9/16	2-3/4	6	234155	14.12	29/64	2-1/8	3-9/16	6	234265	33.76
5/32	1	2-1/16	12	234056	5.27	5/16	1-5/8	2-13/16	6	234166	15.15	15/32	2-1/8	3-5/8	6	234276	33.76
11/64	1-1/16	2-1/8	12	234067	5.94	21/64	1-11/16	2-15/16	6	234177	16.82	31/64	2-3/16	3-11/16	6	234287	33.76
3/16	1-1/8	2-3/16	12	234078	7.00	11/32	1-11/16	3	6	234188	18.18	1/2	2-1/4	3-3/4	6	234298	33.76
13/64	1-3/16	2-1/4	12	234089	7.97	23/64	1-3/4	3-1/16	6	234199	20.91	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	1-5/16	2-7/16	12	234969	11.27	J	1-1/2	2-11/16	6	235068	13.45	S	1-3/4	3-1/16	6	235167	25.55
B	1-3/8	2-1/2	12	234980	11.97	K	1-1/2	2-11/16	6	235079	13.45	T	1-3/4	3-1/16	6	235178	25.55
C	1-3/8	2-1/2	12	234991	11.97	L	1-9/16	2-3/4	6	235090	15.94	U	1-13/16	3-1/8	6	235189	25.55
D	1-3/8	2-1/2	12	235002	11.97	M	1-9/16	2-3/4	6	235101	15.94	V	1-7/8	3-1/4	6	235200	28.33
E	1-3/8	2-1/2	12	235013	10.94	N	1-5/8	2-13/16	6	235112	17.12	W	1-7/8	3-1/4	6	235211	28.33
F	1-7/16	2-5/8	6	235024	12.67	O	1-11/16	2-15/16	6	235123	18.97	X	1-15/16	3-5/16	6	235222	28.33
G	1-7/16	2-5/8	6	235035	12.67	P	1-11/16	2-15/16	6	235134	18.97	Y	1-15/16	3-5/16	6	235233	28.33
H	1-1/2	2-11/16	6	235046	13.45	Q	1-11/16	3	6	235145	20.52	Z	2	3-3/8	6	235244	32.52
I	1-1/2	2-11/16	6	235057	13.45	R	1-11/16	3	6	235156	20.52	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	1-5/16	2-7/16	12	234309	10.85	21	1-1/16	2-1/8	12	234529	5.64	41	13/16	1-13/16	12	234749	3.85
2	1-5/16	2-7/16	12	234320	10.85	22	1-1/16	2-1/8	12	234540	5.64	42	3/4	1-3/4	12	234760	3.79
3	1-1/4	2-3/8	12	234331	10.85	23	1	2-1/16	12	234551	5.64	43	3/4	1-3/4	12	234771	3.79
4	1-1/4	2-3/8	12	234342	9.70	24	1	2-1/16	12	234562	5.64	44	3/4	1-3/4	12	234782	3.79
5	1-1/4	2-3/8	12	234353	9.70	25	1	2-1/16	12	234573	5.27	45	3/4	1-3/4	12	234793	3.79
6	1-1/4	2-3/8	12	234364	9.70	26	1	2-1/16	12	234584	5.27	46	3/4	1-3/4	12	234804	3.79
7	1-3/16	2-1/4	12	234375	7.61	27	1	2-1/16	12	234595	5.27	47	11/16	1-11/16	12	234815	3.79
8	1-3/16	2-1/4	12	234386	7.61	28	15/16	1-15/16	12	234606	4.82	48	11/16	1-11/16	12	234826	3.79
9	1-3/16	2-1/4	12	234397	7.61	29	15/16	1-15/16	12	234617	4.82	49	11/16	1-11/16	12	234837	3.79
10	1-3/16	2-1/4	12	234408	7.61	30	15/16	1-15/16	12	234628	4.52	50	11/16	1-11/16	12	234848	3.79
11	1-3/16	2-1/4	12	234419	7.39	31	7/8	1-7/8	12	234639	4.52	51	11/16	1-11/16	12	234859	3.79
12	1-3/16	2-1/4	12	234430	7.39	32	7/8	1-7/8	12	234650	4.52	52	11/16	1-11/16	12	234870	3.79
13	1-1/8	2-3/16	12	234441	7.27	33	7/8	1-7/8	12	234661	4.36	53	5/8	1-5/8	12	234881	4.24
14	1-1/8	2-3/16	12	234452	7.27	34	7/8	1-7/8	12	234672	4.36	54	5/8	1-5/8	12	234892	4.24
15	1-1/8	2-3/16	12	234463	7.27	35	7/8	1-7/8	12	234683	4.36	55	5/8	1-5/8	12	234903	4.24
16	1-1/8	2-3/16	12	234474	7.24	36	13/16	1-13/16	12	234694	4.36	56	1/2	1-3/8	12	234914	4.24
17	1-1/8	2-3/16	12	234485	7.00	37	13/16	1-13/16	12	234705	4.36	57	1/2	1-3/8	12	234925	4.24
18	1-1/16	2-1/8	12	234496	5.94	38	13/16	1-13/16	12	234716	3.97	58	1/2	1-3/8	12	234936	4.52
19	1-1/16	2-1/8	12	234507	5.64	39	13/16	1-13/16	12	234727	3.97	59	1/2	1-3/8	12	234947	4.52
20	1-1/16	2-1/8	12	234518	5.64	40	13/16	1-13/16	12	234738	3.97	60	1/2	1-3/8	12	234958	4.52

- For use where extreme temperatures are found
- Coating allows for increased machining speeds from 50% up to 200%
- Used in machining Stainless Steels, Nickel-based and Titanium alloys
- Not recommended for aluminum

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

COBALT SCREW MACHINE DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILL BITS

CARBIDE REAMERS

CARBIDE BURS

TAPS & DIES

COUNTERSINKS

HSS & COBALT REAMERS

HSS & COBALT ENDMILLS



# M42 Cobalt Drills

**JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"**



**NAS 907 - M42 COBALT  
STRAW FINISH**

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

**COBALT JOBBER DRILLS**

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/64	3/4	1-3/4	12	111912	3.47	13/64	2-7/16	3-5/8	12	112022	4.91	23/64	3-1/2	4-7/8	6	112132	13.09
1/16	7/8	1-7/8	12	111923	2.39	7/32	2-1/2	3-3/4	12	112033	5.36	3/8	3-5/8	5	6	112143	13.09
5/64	1	2	12	111934	2.39	15/64	2-5/8	3-7/8	12	112044	5.70	25/64	3-3/4	5-1/8	6	112154	14.88
3/32	1-1/4	2-1/4	12	111945	2.39	1/4	2-3/4	4	12	112055	6.09	13/32	3-7/8	5-1/4	6	112165	15.52
7/64	1-1/2	2-5/8	12	111956	2.52	17/64	2-7/8	4-1/8	6	112066	6.91	27/64	3-15/16	5-3/8	6	112176	17.15
1/8	1-5/8	2-3/4	12	111967	3.09	9/32	2-15/16	4-1/4	6	112077	7.24	7/16	4-1/16	5-1/2	6	112187	17.55
9/64	1-3/4	2-7/8	12	111978	3.09	19/64	3-1/16	4-3/8	6	112088	8.82	29/64	4-3/16	5-5/8	6	112198	21.06
5/32	2	3-1/8	12	111989	3.45	5/16	3-3/16	4-1/2	6	112099	9.39	15/32	4-5/16	5-3/4	6	112209	21.45
11/64	2-1/8	3-1/4	12	112000	3.64	21/64	3-5/16	4-5/8	6	112110	10.39	31/64	4-3/8	5-7/8	6	112220	21.58
3/16	2-5/16	3-1/2	12	112011	4.09	11/32	3-7/16	4-3/4	6	112121	11.42	1/2	4-1/2	6	6	112231	21.58

LETTER SIZES						LETTER SIZES						LETTER SIZES							
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE		
A	2-5/8	3-7/8	12	113122	6.45	J	2-7/8	4-1/8	6	113221	8.39	S	3-1/2	4-7/8	6	113320	15.06		
B	2-3/4	4	12	113133	7.45	K	2-15/16	4-1/4	6	113232	8.39	T	3-1/2	4-7/8	6	113331	15.06		
C	2-3/4	4	12	113144	7.45	L	2-15/16	4-1/4	6	113243	9.52	U	3-5/8	5	6	113342	15.06		
D	2-3/4	4	12	113155	8.39	M	3-1/16	4-3/8	6	113254	10.09	V	3-5/8	5	6	113353	16.61		
E	2-3/4	4	12	113166	6.09	N	3-1/16	4-3/8	6	113265	10.09	W	3-3/4	5-1/8	6	113364	16.61		
F	2-7/8	4-1/8	6	113177	7.45	O	3-3/16	4-1/2	6	113276	11.15	X	3-3/4	5-1/8	6	113375	16.61		
G	2-7/8	4-1/8	6	113188	7.45	P	3-5/16	4-5/8	6	113287	11.85	Y	3-7/8	5-1/4	6	113386	17.61		
H	2-7/8	4-1/8	6	113199	8.39	Q	3-7/16	4-3/4	6	113298	12.30	Z	3-7/8	5-1/4	6	113397	19.15		
I	2-7/8	4-1/8	6	113210	8.39	R	3-7/16	4-3/4	6	113309	12.30	-	-	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE		
1	2-5/8	3-7/8	12	112242	6.52	28	1-3/4	2-7/8	12	112539	3.09	55	7/8	1-7/8	12	112836	2.64		
2	2-5/8	3-7/8	12	112253	6.52	29	1-3/4	2-7/8	12	112550	3.00	56	3/4	1-3/4	12	112847	2.97		
3	2-1/2	3-3/4	12	112264	6.09	30	1-5/8	2-3/4	12	112561	2.85	57	3/4	1-3/4	12	112858	2.97		
4	2-1/2	3-3/4	12	112275	6.09	31	1-5/8	2-3/4	12	112572	2.76	58	11/16	1-5/8	12	112869	2.97		
5	2-1/2	3-3/4	12	112286	6.09	32	1-5/8	2-3/4	12	112583	2.73	59	11/16	1-5/8	12	112880	2.97		
6	2-1/2	3-3/4	12	112297	6.09	33	1-1/2	2-5/8	12	112594	2.64	60	11/16	1-5/8	12	112891	2.97		
7	2-7/16	3-5/8	12	112308	4.76	34	1-1/2	2-5/8	12	112605	2.64	61	11/16	1-5/8	12	112902	3.50		
8	2-7/16	3-5/8	12	112319	4.76	35	1-1/2	2-5/8	12	112616	2.64	62	5/8	1-1/2	12	112913	3.50		
9	2-7/16	3-5/8	12	112330	4.76	36	1-7/16	2-1/2	12	112627	2.61	63	5/8	1-1/2	12	112924	3.50		
10	2-7/16	3-5/8	12	112341	4.76	37	1-7/16	2-1/2	12	112638	2.61	64	5/8	1-1/2	12	112935	3.50		
11	2-5/16	3-1/2	12	112352	4.76	38	1-7/16	2-1/2	12	112649	2.42	65	5/8	1-1/2	12	112946	3.50		
12	2-5/16	3-1/2	12	112363	4.76	39	1-3/8	2-3/8	12	112660	2.42	66	1/2	1-3/8	12	112957	3.80		
13	2-5/16	3-1/2	12	112374	4.67	40	1-3/8	2-3/8	12	112671	2.42	67	1/2	1-3/8	12	112968	3.80		
14	2-3/16	3-3/8	12	112385	4.67	41	1-3/8	2-3/8	12	112682	2.39	68	1/2	1-3/8	12	112979	3.80		
15	2-3/16	3-3/8	12	112396	4.67	42	1-1/4	2-1/4	12	112693	2.36	69	1/2	1-3/8	12	112990	3.80		
16	2-3/16	3-3/8	12	112407	4.24	43	1-1/4	2-1/4	12	112704	2.36	70	3/8	1-1/4	12	113001	3.80		
17	2-3/16	3-3/8	12	112418	4.15	44	1-1/8	2-1/8	12	112715	2.36	71	3/8	1-1/4	12	113012	3.80		
18	2-1/8	3-1/4	12	112429	3.79	45	1-1/8	2-1/8	12	112726	2.36	72	5/16	1-1/8	12	113023	3.80		
19	2-1/8	3-1/4	12	112440	3.70	46	1-1/8	2-1/8	12	112737	2.36	73	5/16	1-1/8	12	113034	3.80		
20	2-1/8	3-1/4	12	112451	3.70	47	1	2	12	112748	2.36	74	1/4	1	12	113045	3.80		
21	2-1/8	3-1/4	12	112462	3.67	48	1	2	12	112759	2.36	75	1/4	1	12	113056	3.97		
22	2	3-1/8	12	112473	3.67	49	1	2	12	112770	2.36	76	3/16	7/8	12	113067	3.97		
23	2	3-1/8	12	112484	3.67	50	1	2	12	112781	2.36	77	3/16	7/8	12	113078	3.97		
24	2	3-1/8	12	112495	3.67	51	1	2	12	112792	2.36	78	3/16	7/8	12	113089	3.97		
25	1-7/8	3	12	112506	3.36	52	7/8	1-7/8	12	112803	2.36	79	1/8	3/4	12	113100	3.97		
26	1-7/8	3	12	112517	3.30	53	7/8	1-7/8	12	112814	2.64	80	1/8	3/4	12	113111	3.97		
27	1-7/8	3	12	112528	3.30	54	7/8	1-7/8	12	112825	2.64	-	-	-	-	-	-	-	-

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

# M42 Cobalt Drills



**JOBBER LENGTH - HEAVY DUTY - 135° SPLIT POINT - TYPE "J"**



**NAS 907 - M42 COBALT  
ALTIN COATED**

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
1/16	7/8	1-7/8	12	235266	4.21	7/32	2-1/2	3-3/4	12	235376	9.52	3/8	3-5/8	5	6	235486	23.18	
5/64	1	2	12	235277	4.21	15/64	2-5/8	3-7/8	12	235387	10.09	25/64	3-3/4	5-1/8	6	235497	26.36	
3/32	1-1/4	2-1/4	12	235288	4.21	1/4	2-3/4	4	12	235398	10.82	13/32	3-7/8	5-1/4	6	235508	27.52	
7/64	1-1/2	2-5/8	12	235299	4.45	17/64	2-7/8	4-1/8	6	235409	12.24	27/64	3-15/16	5-3/8	6	235519	30.42	
1/8	1-5/8	2-3/4	12	235310	5.45	9/32	2-15/16	4-1/4	6	235420	12.85	7/16	4-1/16	5-1/2	6	235530	31.12	
9/64	1-3/4	2-7/8	12	235321	5.45	19/64	3-1/16	4-3/8	6	235431	15.64	29/64	4-3/16	5-5/8	6	235541	37.33	
5/32	2	3-1/8	12	235332	6.12	5/16	3-3/16	4-1/2	6	235442	16.64	15/32	4-5/16	5-3/4	6	235552	38.03	
11/64	2-1/8	3-1/4	12	235343	6.45	21/64	3-5/16	4-5/8	6	235453	18.42	31/64	4-3/8	5-7/8	6	235563	38.24	
3/16	2-5/16	3-1/2	12	235354	7.24	11/32	3-7/16	4-3/4	6	235464	20.24	1/2	4-1/2	6	6	235574	38.24	
13/64	2-7/16	3-5/8	12	235365	8.70	23/64	3-1/2	4-7/8	6	235475	23.18	-	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
A	2-5/8	3-7/8	12	236245	11.42	J	2-7/8	4-1/8	6	236344	14.85	S	3-1/2	4-7/8	6	236443	26.73	
B	2-3/4	4	12	236256	13.18	K	2-15/16	4-1/4	6	236355	14.85	T	3-1/2	4-7/8	6	236454	26.73	
C	2-3/4	4	12	236267	13.18	L	2-15/16	4-1/4	6	236366	16.88	U	3-5/8	5	6	236465	26.73	
D	2-3/4	4	12	236278	14.85	M	3-1/16	4-3/8	6	236377	17.91	V	3-5/8	5	6	236476	29.45	
E	2-3/4	4	12	236289	10.82	N	3-1/16	4-3/8	6	236388	17.91	W	3-3/4	5-1/8	6	236487	29.45	
F	2-7/8	4-1/8	6	236300	13.18	O	3-3/16	4-1/2	6	236399	19.79	X	3-3/4	5-1/8	6	236498	29.45	
G	2-7/8	4-1/8	6	236311	13.18	P	3-5/16	4-5/8	6	236410	21.03	Y	3-7/8	5-1/4	6	236509	31.21	
H	2-7/8	4-1/8	6	236322	14.85	Q	3-7/16	4-3/4	6	236421	21.79	Z	3-7/8	5-1/4	6	236520	33.94	
I	2-7/8	4-1/8	6	236333	14.85	R	3-7/16	4-3/4	6	236432	21.79	-	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	235585	11.58	21	2-1/8	3-1/4	12	235805	6.48	41	1-3/8	2-3/8	12	236025	4.21
2	2-5/8	3-7/8	12	235596	11.58	22	2	3-1/8	12	235816	6.48	42	1-1/4	2-1/4	12	236036	4.18
3	2-1/2	3-3/4	12	235607	10.82	23	2	3-1/8	12	235827	6.48	43	1-1/4	2-1/4	12	236047	4.18
4	2-1/2	3-3/4	12	235618	10.82	24	2	3-1/8	12	235838	6.48	44	1-1/8	2-1/8	12	236058	4.18
5	2-1/2	3-3/4	12	235629	10.82	25	1-7/8	3	12	235849	5.94	45	1-1/8	2-1/8	12	236069	4.18
6	2-1/2	3-3/4	12	235640	10.82	26	1-7/8	3	12	235860	5.88	46	1-1/8	2-1/8	12	236080	4.18
7	2-7/16	3-5/8	12	235651	8.42	27	1-7/8	3	12	235871	5.88	47	1	2	12	236091	4.18
8	2-7/16	3-5/8	12	235662	8.42	28	1-3/4	2-7/8	12	235882	5.52	48	1	2	12	236102	4.18
9	2-7/16	3-5/8	12	235673	8.42	29	1-3/4	2-7/8	12	235893	5.33	49	1	2	12	236113	4.18
10	2-7/16	3-5/8	12	235684	8.42	30	1-5/8	2-3/4	12	235904	5.00	50	1	2	12	236124	4.18
11	2-5/16	3-1/2	12	235695	8.42	31	1-5/8	2-3/4	12	235915	4.91	51	1	2	12	236135	4.18
12	2-5/16	3-1/2	12	235706	8.42	32	1-5/8	2-3/4	12	235926	4.85	52	7/8	1-7/8	12	236146	4.18
13	2-5/16	3-1/2	12	235717	8.27	33	1-1/2	2-5/8	12	235937	4.67	53	7/8	1-7/8	12	236157	4.70
14	2-3/16	3-3/8	12	235728	8.27	34	1-1/2	2-5/8	12	235948	4.67	54	7/8	1-7/8	12	236168	4.70
15	2-3/16	3-3/8	12	235739	8.27	35	1-1/2	2-5/8	12	235959	4.67	55	7/8	1-7/8	12	236179	4.70
16	2-3/16	3-3/8	12	235750	7.55	36	1-7/16	2-1/2	12	235970	4.61	56	3/4	1-3/4	12	236190	5.30
17	2-3/16	3-3/8	12	235761	7.36	37	1-7/16	2-1/2	12	235981	4.61	57	3/4	1-3/4	12	236201	5.30
18	2-1/8	3-1/4	12	235772	6.73	38	1-7/16	2-1/2	12	235992	4.27	58	11/16	1-5/8	12	236212	5.30
19	2-1/8	3-1/4	12	235783	6.55	39	1-3/8	2-3/8	12	236003	4.27	59	11/16	1-5/8	12	236223	5.30
20	2-1/8	3-1/4	12	235794	6.55	40	1-3/8	2-3/8	12	236014	4.27	60	11/16	1-5/8	12	236234	5.30

- For use where extreme temperatures are found
- Coating allows for increased machining speeds from 50% up to 200%
- Used in machining Stainless Steels, Nickel-based and Titanium alloys
- Not recommended for aluminum

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

COBALT JOBBER DRILLS

CARRIAGE ENDMILLS

CARRIAGE MICRO ENDMILLS

CARRIAGE THREADMILLS

CARRIAGE DRILL MILLS

CARRIAGE DRILL MILLS

CARRIAGE DRILLS

CARRIAGE REAMERS

CARRIAGE REAMERS

CARRIAGE BURS

CARRIAGE BURS

COUNTERSINKS

TAPS & DIES

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Silver & Deming Drills



**HIGH SPEED STEEL  
1/2" ROUND SHANK - 118° POINT**



**HIGH SPEED STEEL  
1/2" SHANK - 3 FLATS - 118° POINT**

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	120591	27.27
17/32	6	120602	27.27
35/64	6	120613	28.79
9/16	6	120624	28.79
37/64	6	120635	30.91
19/32	6	120646	30.91
39/64	6	120657	32.48
5/8	6	120668	32.48
41/64	6	120679	34.03
21/32	6	120690	34.03
43/64	6	120701	36.18
11/16	6	120712	36.18
45/64	6	120723	36.33
23/32	6	120734	36.33
47/64	6	120745	39.64
3/4	6	120756	39.76
49/64	6	120767	42.15
25/32	6	120778	42.15
51/64	6	120789	44.30
13/16	6	120800	44.30
53/64	6	120811	46.03
27/32	6	120822	46.03
55/64	6	120833	47.55
7/8	6	120844	47.55
57/64	6	120855	49.48
29/32	6	120866	49.48
59/64	6	120877	53.88
15/16	6	120888	53.88
61/64	6	120899	56.48
31/32	6	120910	56.48
63/64	6	120921	62.97
1	6	120932	62.97
1-1/32	6	120943	84.48
1-1/16	6	120954	84.48
1-3/32	6	120965	90.09
1-1/8	6	120976	96.24
1-5/32	6	120987	96.24
1-3/16	6	120998	106.55
1-7/32	6	121009	117.91
1-1/4	6	121020	117.91
1-5/16	6	121031	124.73
1-3/8	6	121042	143.67
1-7/16	6	121053	157.97
1-1/2	6	121064	173.58

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121075	29.73
17/32	6	121086	29.73
35/64	6	121097	31.61
9/16	6	121108	31.61
37/64	6	121119	33.97
19/32	6	121130	33.97
39/64	6	121141	35.55
5/8	6	121152	35.55
41/64	6	121163	37.91
21/32	6	121174	37.91
43/64	6	121185	39.42
11/16	6	121196	39.42
45/64	6	121207	39.94
23/32	6	121218	39.94
47/64	6	121229	43.52
3/4	6	121240	43.52
49/64	6	121251	46.42
25/32	6	121262	46.42
51/64	6	121273	50.88
13/16	6	121284	50.88
53/64	6	121295	53.00
27/32	6	121306	53.00
55/64	6	121317	56.55
7/8	6	121328	56.55
57/64	6	121339	58.67
29/32	6	121350	58.67
59/64	6	121361	60.06
15/16	6	121372	60.06
61/64	6	121383	62.88
31/32	6	121394	62.88
63/64	6	121405	68.91
1	6	121416	68.91

SILVER & DEMING DRILLS

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

# Silver & Deming Drills



**HIGH SPEED STEEL - BLACK & GOLD**  
**1/2" SHANK - 3 FLATS - 118° SPLIT POINT**



**M42 COBALT - STRAW FINISH**  
**1/2" ROUND SHANK - 118° SPLIT POINT**

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121779	34.82
17/32	6	121790	34.82
35/64	6	121801	36.88
9/16	6	121812	36.88
37/64	6	121823	39.15
19/32	6	121834	39.15
39/64	6	121845	40.70
5/8	6	121856	40.70
41/64	6	121867	43.18
21/32	6	121878	43.18
43/64	6	121889	45.03
11/16	6	121900	45.03
45/64	6	121911	46.91
23/32	6	121922	46.91
47/64	6	121933	48.94
3/4	6	121944	48.94
49/64	6	121955	51.67
25/32	6	121966	51.67
51/64	6	121977	54.97
13/16	6	121988	54.97
53/64	6	121999	57.36
27/32	6	122010	57.36
55/64	6	122021	58.91
7/8	6	122032	58.91
57/64	6	122043	61.48
29/32	6	122054	61.48
59/64	6	122065	66.09
15/16	6	122076	66.09
61/64	6	122087	71.18
31/32	6	122098	71.18
63/64	6	122109	74.76
1	6	122120	74.76

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121427	54.24
17/32	6	121438	54.24
35/64	6	121449	65.27
9/16	6	121460	65.27
37/64	6	121471	67.48
19/32	6	121482	67.48
39/64	6	121493	69.21
5/8	6	121504	69.21
41/64	6	121515	72.61
21/32	6	121526	72.61
43/64	6	121537	74.09
11/16	6	121548	74.09
45/64	6	121559	78.15
23/32	6	121570	78.15
47/64	6	121581	81.55
3/4	6	121592	81.55
49/64	6	121603	85.27
25/32	6	121614	85.27
51/64	6	121625	87.55
13/16	6	121636	87.55
53/64	6	121647	94.61
27/32	6	121658	94.61
55/64	6	121669	94.61
7/8	6	121680	94.61
57/64	6	121691	98.21
29/32	6	121702	98.21
59/64	6	121713	102.45
15/16	6	121724	102.45
61/64	6	121735	108.12
31/32	6	121746	108.12
63/64	6	121757	112.36
1	6	121768	112.36

SILVER & DEMING DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# A/C Extension Drills

## 6" OVERALL LENGTH - 135° SPLIT POINT



**HIGH SPEED STEEL - NAS 907 - TYPE "B"  
OXIDE FINISH**



**M42 COBALT - NAS 907 - TYPE "J"  
STRAW FINISH**

### FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
3/32	6	1-1/4	12	116433	5.46	116741	8.48
7/64	6	1-1/2	12	116444	5.91	116752	9.54
1/8	6	1-5/8	12	116455	5.81	116763	9.12
9/64	6	1-3/4	12	116466	6.94	116774	10.82
5/32	6	2	12	116477	6.94	116785	10.73
11/64	6	2-1/8	12	116488	7.58	116796	11.88
3/16	6	2-5/16	12	116499	7.58	116807	11.63
13/64	6	2-7/16	12	116510	9.22	116818	14.71
7/32	6	2-1/2	12	116521	9.22	116829	14.58
15/64	6	2-5/8	12	116532	10.28	116840	16.00
1/4	6	2-3/4	12	116543	10.09	116851	15.71
17/64	6	2-7/8	6	116554	23.06	-	-
9/32	6	2-15/16	6	116565	23.96	-	-
19/64	6	3-1/16	6	116576	28.14	-	-
5/16	6	3-3/16	6	116587	30.55	-	-
21/64	6	3-5/16	6	116598	33.18	-	-
11/32	6	3-7/16	6	116609	32.83	-	-
23/64	6	3-1/2	6	116620	36.84	-	-
3/8	6	3-5/8	6	116631	37.55	-	-

### WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	6	2-5/8	12	116642	10.86	116862	16.80
2	6	2-5/8	12	116653	10.86	116873	16.80
10	6	2-7/16	12	116664	8.80	116884	13.23
11	6	2-5/16	12	116675	8.09	116895	12.72
20	6	2-1/8	12	116686	7.29	116906	11.08
21	6	2-1/8	12	116697	7.29	116917	11.08
29	6	1-3/4	12	116708	7.39	116928	11.40
30	6	1-5/8	12	116719	5.91	116939	8.99
40	6	1-5/8	12	116730	5.36	116950	8.32

**HSS & COBALT A/C EXTENSION DRILLS**

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
ENDMILLS

HSS & COBALT  
REAMERS

# A/C Extension Drills



## 12" OVERALL LENGTH - 135° SPLIT POINT



**HIGH SPEED STEEL - NAS 907 - TYPE "B"  
OXIDE FINISH**



**M42 COBALT - NAS 907 - TYPE "J"  
STRAW FINISH**

### FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1/8	12	1-5/8	12	116961	16.83	118314	26.28
9/64	12	1-3/4	12	116972	16.99	118325	29.49
5/32	12	2	12	116983	16.99	118336	26.89
11/64	12	2-1/8	12	116994	19.14	118347	29.23
3/16	12	2-5/16	12	117005	18.95	118358	28.43
13/64	12	2-7/16	12	117016	21.75	118369	37.20
7/32	12	2-1/2	12	117027	21.52	118380	33.53
15/64	12	2-5/8	12	117038	24.25	118391	35.91
1/4	12	2-3/4	12	117049	23.13	118402	34.31
17/64	12	2-7/8	6	117060	28.81	-	-
9/32	12	2-15/16	6	117071	29.42	-	-
19/64	12	3-1/16	6	117082	33.92	-	-
5/16	12	3-3/16	6	117093	37.13	-	-
21/64	12	3-5/16	6	117104	40.34	-	-
11/32	12	3-7/16	6	117115	39.89	-	-
23/64	12	3-1/2	6	117126	45.19	-	-
3/8	12	3-5/8	6	117137	45.61	-	-
25/64	12	3-3/4	6	117148	50.88	-	-
13/32	12	3-7/8	6	117159	49.05	-	-
27/64	12	3-15/16	6	117170	54.09	-	-
7/16	12	4-1/16	6	117181	54.19	-	-
29/64	12	4-3/16	6	117192	61.13	-	-
15/32	12	4-5/16	6	117203	63.34	-	-
31/64	12	4-3/8	6	117214	65.69	-	-
1/2	12	4-1/2	6	117225	64.98	-	-

### WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	12	2-5/8	12	117236	26.40	118413	37.20
10	12	2-7/16	12	117247	21.23	118424	29.74
11	12	2-5/16	12	117258	21.42	118435	29.74
20	12	2-1/8	12	117269	19.27	118446	27.27
21	12	2-1/8	12	117280	18.92	118457	27.27
29	12	1-3/4	12	117291	20.04	118468	28.62
30	12	1-5/8	12	117302	18.92	118479	27.27
40	12	1-3/8	12	117313	18.92	118490	27.27

HSS & COBALT A/C EXTENSION DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



# Drills • Drifts • Extractors

## EXTRA LENGTH - STRAIGHT SHANK - 118° POINT - 12" O.A.L. HIGH SPEED STEEL



BRIGHT FINISH

FRACTIONAL SIZES					FRACTIONAL SIZES					FRACTIONAL SIZES				
SIZE	FLUTE LENGTH	O.A.L.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	ITEM#	LIST PRICE
1/8	9	12	117863	36.27	19/64	9	12	117984	49.07	15/32	9	12	118105	68.83
9/64	9	12	117874	52.57	5/16	9	12	117995	49.07	31/64	9	12	118116	70.43
5/32	9	12	117885	47.80	21/64	9	12	118006	70.13	1/2	9	12	118127	70.43
11/64	9	12	117896	40.77	11/32	9	12	118017	52.57	17/32	9	12	118149	89.23
3/16	9	12	117907	40.77	23/64	9	12	118028	52.57	9/16	9	12	118171	89.23
13/64	9	12	117918	49.40	3/8	9	12	118039	48.43	19/32	9	12	118193	111.53
7/32	9	12	117929	44.23	25/64	9	12	118050	73.30	5/8	9	12	118215	108.37
15/64	9	12	117940	44.23	13/32	9	12	118061	73.30	11/16	9	12	118259	114.73
1/4	9	12	117951	45.73	27/64	9	12	118072	73.30	3/4	9	12	118303	129.23
17/64	9	12	117962	47.33	7/16	9	12	118083	62.60	-	-	-	-	-
9/32	9	12	117973	47.33	29/64	9	12	118094	76.50	-	-	-	-	-

## 1/4" REDUCED SHANK - 118° POINT HIGH SPEED STEEL



OXIDE FINISH

SIZE	SHANK DIAMETER	PKG. QTY.	ITEM#	LIST PRICE
9/32	1/4	6	116323	6.43
5/16	1/4	6	116334	7.73
11/32	1/4	6	116345	7.73
3/8	1/4	6	116356	10.20
13/32	1/4	6	116367	11.77
7/16	1/4	6	116378	13.57
15/32	1/4	6	116389	15.07
1/2	1/4	6	116400	16.73

## 3/8" REDUCED SHANK - 118° POINT HIGH SPEED STEEL



OXIDE FINISH

SIZE	SHANK DIAMETER	PKG. QTY.	ITEM#	LIST PRICE
25/64	3/8	6	116235	10.53
13/32	3/8	6	116246	11.90
27/64	3/8	6	116257	12.33
7/16	3/8	6	116268	13.17
29/64	3/8	6	116279	14.17
15/32	3/8	6	116290	15.17
31/64	3/8	6	116301	15.80
1/2	3/8	6	116312	16.30

## DOUBLE END - 135° POINT HIGH SPEED STEEL



OXIDE FINISH

SIZE	PKG. QTY.	ITEM#	LIST PRICE
1/8	12	116411	3.53
#30	12	116422	3.53

## DRILL DRIFTS



OXIDE FINISH

SIZE	FOR USE WITH TAPER#	ITEM#	LIST PRICE
1	1	115157	21.50
2	2	115168	25.50
3	3	115179	29.20
4	4,5,6	115190	32.20

## SCREW EXTRACTORS HIGH SPEED STEEL



SIZE	FOR SCREW & BOLT SIZES	PIPE SIZE	PKG. QTY.	ITEM#	LIST PRICE
1	3/16 - 1/4	-	1	115014	6.03
2	1/4 - 5/16	-	1	115025	6.43
3	5/16 - 7/16	-	1	115036	7.80
4	7/16 - 9/16	1/8	1	115047	8.27
5	9/16 - 3/4	1/4	1	115058	10.33
6	3/4 - 1	3/8	1	115069	22.70
7	1 - 1-3/8	1/2	1	115080	36.53
8	1-3/8 - 1-3/4	3/4	1	115091	49.70
9	1-3/4 - 2-1/8	1	1	115102	86.43
10	2-1/8 - 2-1/2	1-1/4	1	115113	224.30
11	2-1/2 - 3	1-1/2	1	115124	238.77
12	3 - 3-1/2	2	1	115135	316.73
SET	SIZES 1-5	-	1	115146	38.83

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT ENDMILLS  
HSS & COBALT REAMERS

### DRILLS • DRIFTS • EXTRACTORS



# Technical Information

## HIGH SPEED STEEL DRILLING ELEMENT & DIMENSIONAL TOLERANCES FOR 2, 3 & 4 FLUTE DRILLS

### DIAMETER AT POINT

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+0.0000 TO -0.0005
OVER 1/8 TO 1/4	+0.0000 TO -0.0007
OVER 1/4 TO 1/2	+0.0000 TO -0.0010
OVER 1/2 TO 1	+0.0000 TO -0.0012
OVER 1 TO 2	+0.0000 TO -0.0015
OVER 2 TO 3-1/2	+0.0000 TO -0.0020

### SHANK DIAMETER

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	-0.0000 TO -0.0025
OVER 1/8 TO 1/4	-0.0005 TO -0.0030
OVER 1/4 TO 1/2	-0.0005 TO -0.0045
OVER 1/2 TO 2	-0.0005 TO -0.0030

### 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.



# High Speed Steel Endmills

## SQUARE END - 30° HELIX



2 FLUTE - UNCOATED



4 & 6 FLUTE - NON CENTER CUTTING - UNCOATED



2 FLUTE - ALTIN COATED



4 & 6 FLUTE - NON CENTER CUTTING - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	3/8	3/8	2-5/16	2	167550	27.90	167957	34.87
5/32	3/8	3/8	2-5/16	2	167561	36.37	167968	45.43
3/16	3/8	9/32	2-5/16	2	167572	27.90	167979	34.87
7/32	3/8	7/16	2-5/16	2	167583	36.37	167990	45.43
1/4	3/8	1/2	2-5/16	2	167594	27.90	168001	34.87
9/32	3/8	1/2	2-5/16	2	167605	36.37	168012	45.43
5/16	3/8	9/16	2-5/16	2	167616	27.90	168023	34.87
3/8	3/8	9/16	2-5/16	2	167627	27.90	168034	34.87
7/16	3/8	13/16	2-1/2	2	167638	38.57	168045	48.20
1/2	3/8	13/16	2-1/2	2	167649	38.57	168056	48.20
1/2	1/2	1	3	2	167660	40.77	168067	51.00
9/16	1/2	1-1/8	3-1/8	2	167671	49.77	168078	62.20
5/8	1/2	1-1/8	3-1/8	2	167682	55.73	168089	69.67
5/8	5/8	1-5/16	3-7/16	2	167693	56.60	168100	70.77
3/4	1/2	1-5/16	3-5/16	2	167704	64.70	168111	80.97
3/4	5/8	1-5/16	3-7/16	2	167715	64.70	168122	80.97
3/4	3/4	1-5/16	3-9/16	2	167726	64.70	168133	80.97
13/16	5/8	1-1/2	3-5/8	2	167737	79.57	168144	99.43
13/16	3/4	1-1/2	3-3/4	2	167748	80.03	168155	99.77
7/8	5/8	1-1/2	3-5/8	2	167759	79.57	168166	99.43
7/8	3/4	1-1/2	3-3/4	2	167770	88.67	168177	110.83
7/8	7/8	1-1/2	3-3/4	2	167781	88.67	168188	110.83
15/16	5/8	1-1/2	3-5/8	2	167792	96.37	168199	120.47
15/16	3/4	1-1/2	3-3/4	2	167803	102.07	168210	127.60
15/16	7/8	1-1/2	3-3/4	2	167814	96.37	168221	120.47
1	5/8	1-1/2	3-5/8	2	167825	90.23	168232	112.77
1	3/4	1-1/2	3-3/4	2	167836	90.23	168243	112.77
1	7/8	1-1/2	3-3/4	2	167847	96.37	168254	120.47
1	1	1-5/8	4-1/8	2	167858	102.73	168265	128.40
1-1/8	7/8	1-5/8	3-7/8	2	167869	158.10	168276	197.63
1-1/8	1	1-5/8	4-1/8	2	167880	150.23	168287	187.80
1-1/4	7/8	1-5/8	3-7/8	2	167891	158.10	168298	197.57
1-1/4	1	1-5/8	4-1/8	2	167902	167.50	168309	209.37
1-1/4	1-1/4	1-5/8	4-1/8	2	167913	178.83	168320	223.57
1-3/8	1	1-5/8	4-1/8	2	167924	186.40	168331	233.00
1-1/2	1	1-5/8	4-1/8	2	167935	200.30	168342	250.40
1-1/2	1-1/4	1-5/8	4-1/8	2	167946	200.30	168353	250.40

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	3/8	3/8	2-5/16	4	169134	28.50	169640	35.60
5/32	3/8	3/8	2-5/16	4	169145	39.00	169651	48.77
3/16	3/8	1/2	2-3/8	4	169156	28.50	169662	35.60
7/32	3/8	1/2	2-3/8	4	169167	39.00	169673	48.77
1/4	3/8	5/8	2-7/16	4	169178	28.50	169684	35.60
9/32	3/8	11/16	2-1/2	4	169189	39.00	169695	48.77
5/16	3/8	3/4	2-1/2	4	169200	28.50	169706	35.60
11/32	3/8	3/4	2-1/2	4	169211	39.83	169717	49.80
3/8	3/8	3/4	2-1/2	4	169222	28.50	169728	35.60
13/32	3/8	3/4	2-1/2	4	169233	58.23	169739	72.80
7/16	3/8	1	2-11/16	4	169244	38.47	169750	48.10
15/32	3/8	1	2-11/16	4	169255	68.27	169761	76.80
1/2	3/8	1	2-11/16	4	169266	38.47	169772	48.10
1/2	1/2	1-1/4	3-1/4	4	169277	38.47	169783	48.10
17/32	1/2	1-1/4	3-1/4	4	169288	78.20	169794	97.77
9/16	1/2	1-3/8	3-3/8	4	169299	50.07	169805	62.57
5/8	1/2	1-3/8	3-3/8	4	169310	54.50	169816	68.13
5/8	5/8	1-5/8	3-3/4	4	169321	60.57	169827	75.70
11/16	1/2	1-5/8	3-5/8	4	169332	63.17	169838	78.97
11/16	5/8	1-5/8	3-3/4	4	169343	64.37	169849	80.47
3/4	1/2	1-5/8	3-5/8	4	169354	65.40	169860	81.73
3/4	5/8	1-5/8	3-3/4	4	169365	65.40	169871	81.73
3/4	3/4	1-5/8	3-7/8	4	169376	67.83	169882	81.73
13/16	3/4	1-7/8	4-1/8	4	169387	86.50	169893	108.17
7/8	3/4	1-7/8	4-1/8	4	169398	86.20	169904	107.80
7/8	7/8	1-7/8	4-1/8	4	169409	86.20	169915	107.80
15/16	3/4	1-7/8	4-1/8	4	169420	110.70	169926	138.40
15/16	7/8	1-7/8	4-1/8	4	169431	104.77	169937	126.10
1	3/4	1-7/8	4-1/8	4	169442	98.13	169948	122.67
1	7/8	1-7/8	4-1/8	4	169453	104.77	169959	130.97
1	1	2	4-1/2	4	169464	103.90	169970	129.90
1-1/8	7/8	2	4-1/4	6	169475	150.63	169981	188.27
1-1/8	1	2	4-1/2	6	169486	148.27	169992	184.80
1-1/4	7/8	2	4-1/4	6	169497	163.63	170003	204.53
1-1/4	1	2	4-1/2	6	169508	158.90	170014	198.63
1-1/4	1-1/4	2	4-1/2	4	169519	169.67	170025	212.10
1-1/4	1-1/4	2	4-1/2	6	169530	162.00	170036	202.47
1-3/8	1	2	4-1/2	6	169541	183.93	170047	223.80
1-1/2	1	2	4-1/2	6	169552	198.50	170058	248.87
1-1/2	1-1/4	2	4-1/2	4	169563	208.60	170069	260.83
1-1/2	1-1/4	2	4-1/2	6	169574	227.17	170080	283.93
1-5/8	1-1/4	2	4-1/2	6	169585	227.20	170091	285.23
1-3/4	1-1/4	2	4-1/2	4	169596	275.40	170102	344.27
1-3/4	1-1/4	2	4-1/2	6	169607	252.90	170113	314.93
2	1-1/4	2	4-1/2	4	169618	335.83	170124	419.77
2	1-1/4	2	4-1/2	6	169629	369.03	170135	457.67

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+ .0015, -.0000	+ .0000, -.0005

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT REAMERS  
**HSS ENDMILLS**

# High Speed Steel Endmills



## DOUBLE END - 2 FLUTE - SQUARE END - 30° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	2	166758	42.70	166989	53.37
5/32	3/8	7/16	3-1/8	2	166769	45.33	167000	56.67
3/16	3/8	7/16	3-1/8	2	166780	42.73	167011	53.40
7/32	3/8	1/2	3-1/8	2	166791	45.37	167022	56.67
1/4	3/8	1/2	3-1/8	2	166802	42.73	167033	53.40
9/32	3/8	9/16	3-1/8	2	166813	45.37	167044	56.67
5/16	3/8	9/16	3-1/8	2	166824	42.73	167055	53.40
11/32	3/8	9/16	3-1/8	2	166835	45.37	167066	56.67
3/8	3/8	9/16	3-1/8	2	166846	42.73	167077	53.40
13/32	1/2	13/16	3-3/4	2	166857	69.10	167088	86.37
7/16	1/2	13/16	3-3/4	2	166868	65.00	167099	81.23
15/32	1/2	13/16	3-3/4	2	166879	69.10	167110	86.37
1/2	1/2	13/16	3-3/4	2	166890	65.00	167121	81.23
9/16	5/8	1-1/8	4-1/2	2	166901	88.43	167132	110.53
5/8	5/8	1-1/8	4-1/2	2	166912	88.43	167143	110.53
11/16	3/4	1-5/16	5	2	166923	111.37	167154	139.20
3/4	3/4	1-5/16	5	2	166934	111.37	167165	139.20
13/16	7/8	1-9/16	5-1/2	2	166945	140.10	167176	175.10
7/8	7/8	1-9/16	5-1/2	2	166956	140.10	167187	175.10
15/16	1	1-5/8	5-7/8	2	166967	180.50	167198	225.63
1	1	1-5/8	5-7/8	2	166978	172.33	167209	215.40

## DOUBLE END - 4 FLUTE - SQUARE END - 30° HELIX - NON CENTER CUTTING



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	4	168672	43.13	168903	53.93
5/32	3/8	7/16	3-1/8	4	168683	45.57	168914	56.93
3/16	3/8	1/2	3-1/8	4	168694	43.13	168925	53.93
7/32	3/8	9/16	3-1/4	4	168705	45.57	168936	56.93
1/4	3/8	5/8	3-3/8	4	168716	43.13	168947	53.93
9/32	3/8	11/16	3-3/8	4	168727	45.57	168958	56.93
5/16	3/8	3/4	3-1/2	4	168738	43.13	168969	53.93
11/32	3/8	3/4	3-1/2	4	168749	45.57	168980	56.93
3/8	3/8	3/4	3-1/2	4	168760	43.13	168991	53.93
13/32	1/2	1	4-1/8	4	168771	66.97	169002	83.70
7/16	1/2	1	4-1/8	4	168782	65.13	169013	81.40
15/32	1/2	1	4-1/8	4	168793	66.97	169024	83.70
1/2	1/2	1	4-1/8	4	168804	65.13	169035	81.40
9/16	5/8	1-3/8	5	4	168815	86.93	169046	108.67
5/8	5/8	1-3/8	5	4	168826	86.93	169057	108.67
11/16	3/4	1-5/8	5-5/8	4	168837	109.47	169068	136.87
3/4	3/4	1-5/8	5-5/8	4	168848	109.47	169079	136.87
13/16	7/8	1-7/8	6-1/8	4	168859	146.17	169090	182.73
7/8	7/8	1-7/8	6-1/8	4	168870	146.17	169101	182.73
15/16	1	1-7/8	6-3/8	4	168881	177.00	169112	221.27
1	1	1-7/8	6-3/8	4	168892	169.73	169123	212.03

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

HSS ENDMILLS  
CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT REAMERS



# M42 Cobalt Endmills

## SQUARE END - 30° HELIX



2 FLUTE - UNCOATED



4 & 6 FLUTE - CENTER CUTTING - UNCOATED



2 FLUTE - ALTIN COATED



4 & 6 FLUTE - CENTER CUTTING - ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	3/8	3/8	2-5/16	2	232142	33.97	232549	42.47
5/32	3/8	3/8	2-5/16	2	232153	44.27	232560	55.30
3/16	3/8	9/32	2-5/16	2	232164	33.97	232571	42.47
7/32	3/8	7/16	2-5/16	2	232175	44.27	232582	55.30
1/4	3/8	1/2	2-5/16	2	232186	33.97	232593	42.47
9/32	3/8	1/2	2-5/16	2	232197	44.27	232604	55.30
5/16	3/8	9/16	2-5/16	2	232208	33.97	232615	42.47
3/8	3/8	9/16	2-5/16	2	232219	33.97	232626	42.47
7/16	3/8	13/16	2-1/2	2	232230	46.93	232637	58.67
1/2	3/8	13/16	2-1/2	2	232241	46.93	232648	58.67
1/2	1/2	1	3	2	232252	49.63	232659	62.07
9/16	1/2	1-1/8	3-1/8	2	232263	60.57	232670	75.73
5/8	1/2	1-1/8	3-1/8	2	232274	67.83	232681	84.80
5/8	5/8	1-5/16	3-7/16	2	232285	68.90	232692	86.13
3/4	1/2	1-5/16	3-5/16	2	232296	78.77	232703	98.57
3/4	5/8	1-5/16	3-7/16	2	232307	78.77	232714	98.57
3/4	3/4	1-5/16	3-9/16	2	232318	78.77	232725	98.57
13/16	5/8	1-1/2	3-5/8	2	232329	96.83	232736	121.03
13/16	3/4	1-1/2	3-3/4	2	232340	97.40	232747	121.47
7/8	5/8	1-1/2	3-5/8	2	232351	96.83	232758	121.03
7/8	3/4	1-1/2	3-3/4	2	232362	107.93	232769	134.90
7/8	7/8	1-1/2	3-3/4	2	232373	107.93	232780	134.90
15/16	5/8	1-1/2	3-5/8	2	232384	117.30	232791	146.60
15/16	3/4	1-1/2	3-3/4	2	232395	124.23	232802	155.33
15/16	7/8	1-1/2	3-3/4	2	232406	117.30	232813	146.60
1	5/8	1-1/2	3-5/8	2	232417	109.80	232824	137.27
1	3/4	1-1/2	3-3/4	2	232428	109.80	232835	137.27
1	7/8	1-1/2	3-3/4	2	232439	117.30	232846	146.60
1	1	1-5/8	4-1/8	2	232450	125.03	232857	156.30
1-1/8	7/8	1-5/8	3-7/8	2	232461	192.47	232868	240.57
1-1/8	1	1-5/8	4-1/8	2	232472	182.87	232879	228.60
1-1/4	7/8	1-5/8	3-7/8	2	232483	192.47	232890	240.50
1-1/4	1	1-5/8	4-1/8	2	232494	203.87	232901	254.83
1-1/4	1-1/4	1-5/8	4-1/8	2	232505	217.70	232912	272.13
1-3/8	1	1-5/8	4-1/8	2	232516	226.90	232923	283.63
1-1/2	1	1-5/8	4-1/8	2	232527	243.83	232934	304.80
1-1/2	1-1/4	1-5/8	4-1/8	2	232538	243.83	232945	304.80

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	3/8	3/8	2-5/16	4	230382	34.67	230800	43.33
5/32	3/8	3/8	2-5/16	4	230393	47.50	230811	59.37
3/16	3/8	1/2	2-3/8	4	230404	34.67	230822	43.33
7/32	3/8	1/2	2-3/8	4	230415	47.50	230833	59.37
1/4	3/8	5/8	2-7/16	4	230426	34.67	230844	43.33
9/32	3/8	11/16	2-1/2	4	230437	47.50	230855	59.37
5/16	3/8	3/4	2-1/2	4	230448	34.67	230866	43.33
11/32	3/8	3/4	2-1/2	4	230459	48.50	230877	60.63
3/8	3/8	3/4	2-1/2	4	230470	34.67	230888	43.33
13/32	3/8	3/4	2-1/2	4	230481	70.87	230899	88.60
7/16	3/8	1	2-11/16	4	230492	46.83	230910	58.57
15/32	3/8	1	2-11/16	4	230503	83.10	230921	93.50
1/2	3/8	1	2-11/16	4	230514	46.83	230932	58.57
1/2	1/2	1-1/4	3-1/4	4	230525	46.83	230943	58.57
17/32	1/2	1-1/4	3-1/4	4	230536	95.20	230954	119.00
9/16	1/2	1-3/8	3-3/8	4	230547	60.93	230965	76.17
5/8	1/2	1-3/8	3-3/8	4	230558	66.37	230976	82.93
5/8	5/8	1-5/8	3-3/4	4	230569	73.70	230987	92.13
11/16	1/2	1-5/8	3-5/8	4	230580	76.90	230998	96.13
11/16	5/8	1-5/8	3-3/4	4	230591	78.37	231009	97.97
3/4	1/2	1-5/8	3-5/8	4	230602	79.57	231020	99.47
3/4	5/8	1-5/8	3-3/4	4	230613	79.57	231031	99.47
3/4	3/4	1-5/8	3-7/8	4	230624	82.57	231042	99.47
13/16	3/4	1-7/8	4-1/8	4	230635	105.30	231053	131.67
7/8	3/4	1-7/8	4-1/8	4	230646	104.93	231064	131.20
7/8	7/8	1-7/8	4-1/8	4	230657	104.93	231075	131.20
15/16	3/4	1-7/8	4-1/8	4	230668	134.77	231086	168.47
1	3/4	1-7/8	4-1/8	4	230679	119.43	231097	149.30
1	7/8	1-7/8	4-1/8	4	230690	127.57	231108	159.43
1	1	2	4-1/2	4	230701	126.50	231119	158.10
1-1/8	1	2	4-1/2	6	230712	180.47	231130	224.93
1-1/4	1	2	4-1/2	6	230723	193.43	231141	241.80
1-1/4	1-1/4	2	4-1/2	6	230734	197.17	231152	246.47
1-3/8	1	2	4-1/2	6	230745	223.87	231163	272.43
1-1/2	1	2	4-1/2	6	230756	241.63	231174	302.93
1-1/2	1-1/4	2	4-1/2	4	230767	253.90	231185	317.50
1-5/8	1-1/4	2	4-1/2	6	230778	276.57	231196	347.20
2	1-1/4	2	4-1/2	6	230789	449.23	231207	557.10

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

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT REAMERS

COBALT ENDMILLS

# M42 Cobalt Endmills



## DOUBLE END - 2 FLUTE - SQUARE END - 30° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	2	231218	51.97	231449	64.97
5/32	3/8	7/16	3-1/8	2	231229	55.17	231460	68.97
3/16	3/8	7/16	3-1/8	2	231240	52.03	231471	65.00
7/32	3/8	1/2	3-1/8	2	231251	55.20	231482	69.00
1/4	3/8	1/2	3-1/8	2	231262	52.03	231493	65.00
9/32	3/8	9/16	3-1/8	2	231273	55.20	231504	69.00
5/16	3/8	9/16	3-1/8	2	231284	52.03	231515	65.00
11/32	3/8	9/16	3-1/8	2	231295	55.20	231526	69.00
3/8	3/8	9/16	3-1/8	2	231306	52.03	231537	65.00
13/32	1/2	13/16	3-3/4	2	231317	84.10	231548	45.13
7/16	1/2	13/16	3-3/4	2	231328	79.10	231559	98.87
15/32	1/2	13/16	3-3/4	2	231339	84.10	231570	105.13
1/2	1/2	13/16	3-3/4	2	231350	79.10	231581	98.87
9/16	5/8	1-1/8	4-1/2	2	231361	107.63	231592	134.53
5/8	5/8	1-1/8	4-1/2	2	231372	107.63	231603	134.53
11/16	3/4	1-5/16	5	2	231383	135.53	231614	169.47
3/4	3/4	1-5/16	5	2	231394	135.53	231625	169.47
13/16	7/8	1-9/16	5-1/2	2	231405	170.53	231636	213.17
7/8	7/8	1-9/16	5-1/2	2	231416	170.53	231647	213.17
15/16	1	1-5/8	5-7/8	2	231427	219.73	231658	274.67
1	1	1-5/8	5-7/8	2	231438	209.77	231669	262.20

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	4	231680	52.50	231911	65.63
5/32	3/8	7/16	3-1/8	4	231691	55.43	231922	69.30
3/16	3/8	1/2	3-1/8	4	231702	52.50	231933	65.63
7/32	3/8	9/16	3-1/4	4	231713	55.43	231944	69.30
1/4	3/8	5/8	3-3/8	4	231724	52.50	231955	65.63
9/32	3/8	11/16	3-3/8	4	231735	55.43	231966	69.30
5/16	3/8	3/4	3-1/2	4	231746	52.50	231977	65.63
11/32	3/8	3/4	3-1/2	4	231757	55.43	231988	69.30
3/8	3/8	3/4	3-1/2	4	231768	52.50	231999	65.63
13/32	1/2	1	4-1/8	4	231779	81.50	232010	101.87
7/16	1/2	1	4-1/8	4	231790	79.27	232021	99.10
15/32	1/2	1	4-1/8	4	231801	81.50	232032	101.87
1/2	1/2	1	4-1/8	4	231812	79.27	232043	99.10
9/16	5/8	1-3/8	5	4	231823	105.80	232054	132.27
5/8	5/8	1-3/8	5	4	231834	105.80	232065	132.27
11/16	3/4	1-5/8	5-5/8	4	231845	133.27	232076	166.60
3/4	3/4	1-5/8	5-5/8	4	231856	133.27	232087	166.60
13/16	7/8	1-7/8	6-1/8	4	231867	177.93	232098	222.43
7/8	7/8	1-7/8	6-1/8	4	231878	177.93	232109	222.43
15/16	1	1-7/8	6-3/8	4	231889	215.47	232120	269.33
1	1	1-7/8	6-3/8	4	231900	206.60	232131	258.10

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

COBALT ENDMILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT REAMERS



# M42 Cobalt Roughing Endmills

## COARSE PITCH - 30° HELIX - NON CENTER CUTTING



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/4	3/8	5/8	2-7/16	3	167220	64.00	167385	79.97
5/16	3/8	3/4	2-1/2	3	167231	69.83	167396	87.33
3/8	3/8	3/4	2-1/2	4	167242	72.97	167407	91.23
7/16	3/8	1	2-11/16	4	167253	73.80	167418	91.77
1/2	1/2	1	3	4	167264	74.73	167429	93.43
1/2	1/2	1-1/4	3-1/4	4	167275	77.30	167440	96.63
5/8	5/8	1-5/8	3-3/4	4	167286	98.37	167451	122.97
3/4	3/4	1-5/8	3-7/8	4	167297	108.27	167462	135.33
7/8	3/4	1-7/8	4-1/8	5	167308	138.60	167473	187.53
1	1	2	4-1/2	5	167319	145.03	167484	181.27
1-1/8	1	2	4-1/2	6	167330	225.30	167495	281.50
1-1/4	1-1/4	2	4-1/2	6	167341	244.47	167506	305.50
1-1/2	1-1/4	2	4-1/2	6	167352	286.63	167517	358.30
1-3/4	1-1/4	2-1/2	5	6	167363	432.37	167528	540.47
2	1-1/4	2	4-1/2	8	167374	398.30	167539	497.87

## FINE PITCH - 30° HELIX - NON CENTER CUTTING



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/4	3/8	5/8	2-7/16	3	168364	64.00	168518	79.97
5/16	3/8	3/4	2-1/2	3	168375	69.87	168529	87.33
3/8	3/8	3/4	2-1/2	4	168386	73.43	168540	91.77
7/16	3/8	1	2-11/16	4	168397	73.80	168551	92.23
1/2	1/2	1-1/4	3-1/4	4	168408	77.30	168562	93.43
5/8	5/8	1-5/8	3-3/4	4	168419	98.37	168573	122.97
3/4	3/4	1-5/8	3-7/8	4	168430	108.27	168584	135.33
7/8	3/4	1-7/8	4-1/8	5	168441	141.63	168595	177.03
1	1	2	4-1/2	5	168452	145.10	168606	181.40
1-1/8	1	2	4-1/2	6	168463	240.60	168617	300.73
1-1/4	1-1/4	2	4-1/2	6	168474	244.47	168628	305.50
1-1/2	1-1/4	2	4-1/2	6	168485	302.00	168639	377.50
1-3/4	1-1/4	2-1/2	5	6	168496	432.37	168650	540.47
2	1-1/4	2	4-1/2	8	168507	425.30	168661	532.13

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.005, -.005	+.0000, -.0005

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT REAMERS

COBALT ROUGHING ENDMILLS

# Chucking Reamers



## STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#80	.0135	3/8	2	3/4	.0135	182708	29.39	185920	32.53
#79	.0145	3/8	2	3/4	.0145	182719	29.39	185931	32.53
1/64	.0156	3/8	2	3/4	.0156	182730	29.39	185942	32.53
#78	.0160	3/8	2	7/8	.0160	182741	29.39	185953	32.53
#77	.0180	3/8	2	7/8	.0180	182752	29.39	185964	32.53
#76	.0200	3/8	2	7/8	.0200	182763	29.39	185975	32.53
#75	.0210	1/2	3	1	.0210	182774	29.39	185986	32.53
#74	.0225	1/2	3	1	.0225	182785	29.39	185997	32.53
#73	.0240	1/2	3	1-1/8	.0240	182796	29.39	186008	32.53
#72	.0250	1/2	3	1-1/8	.0250	182807	29.39	186019	32.53
#71	.0260	1/2	3	1-1/4	.0260	182818	29.39	186030	32.53
#70	.0280	1/2	3	1-1/4	.0280	182829	29.39	186041	32.53
#69	.0292	1/2	3	1-3/8	.0292	182840	29.39	186052	32.53
#68	.0310	1/2	3	1-3/8	.0310	182851	29.39	186063	32.53
1/32	.0312	1/2	3	1-3/8	.0312	182862	23.17	186074	26.77
#67	.0320	1/2	3	1-3/8	.0320	182873	24.61	186085	26.77
#66	.0330	1/2	3	1-3/8	.0330	182884	24.61	186096	26.77
#65	.0350	1/2	3	1-1/2	.0350	182895	24.61	186107	26.77
#64	.0360	1/2	3	1-1/2	.0360	182906	24.61	186118	26.77
#63	.0370	1/2	3	1-1/2	.0370	182917	24.61	186129	26.77
#62	.0380	1/2	3	1-1/2	.0380	182928	24.61	186140	26.77
#61	.0390	1/2	3	1-1/2	.0390	182939	24.61	186151	26.77
1.0mm	.0394	1/2	4	2-1/2	.0394	182950	24.61	186162	26.35
#60	.0400	1/2	4	2-1/2	.0390	182961	24.61	186173	26.35
#59	.0410	1/2	4	2-1/2	.0390	182972	24.61	186184	26.35
#58	.0420	1/2	4	2-1/2	.0390	182983	24.61	186195	26.35
#57	.0430	1/2	4	2-1/2	.0390	182994	24.61	186206	26.35
#56	.0465	1/2	4	2-1/2	.0455	183005	24.61	186217	26.35
3/64	.0469	1/2	4	2-1/2	.0455	183016	24.61	186228	26.35
#55	.0520	1/2	4	2-1/2	.0510	183027	24.61	186239	26.35
#54	.0550	1/2	4	2-1/2	.0510	183038	24.61	186250	26.35
1.5mm	.0591	1/2	4	2-1/2	.0510	183049	24.61	186261	26.35
#53	.0595	1/2	4	2-1/2	.0585	183060	24.61	186272	26.35
1/16	.0625	1/2	4	2-1/2	.0585	183071	22.12	186283	26.35
#52	.0635	1/2	4	2-1/2	.0585	183082	22.12	186294	26.35
#51	.0670	3/4	4	3	.0660	183093	19.80	186305	21.21
#50	.0700	3/4	4	3	.0660	183104	19.80	186316	21.21
#49	.0730	3/4	4	3	.0660	183115	19.80	186327	21.21
#48	.0760	3/4	4	3	.0720	183126	19.80	186338	21.21
5/64	.0781	3/4	4	3	.0720	183137	19.80	186349	21.21
#47	.0785	3/4	4	3	.0720	183148	19.80	186360	21.21
2.0mm	.0787	3/4	4	3	.0720	183159	19.80	186371	21.21
#46	.0810	3/4	4	3	.0771	183170	19.80	186382	21.21
#45	.0820	3/4	4	3	.0771	183181	19.80	186393	21.21
#44	.0860	3/4	4	3	.0810	183192	19.80	186404	21.21
#43	.0890	3/4	4	3	.0810	183203	19.80	186415	21.21
#42	.0935	3/4	4	3	.0880	183214	19.80	186426	21.21
3/32	.0938	3/4	4	3	.0880	183225	17.80	186437	21.21
#41	.0960	7/8	4	3-1/2	.0928	183236	20.00	186448	21.37
#40	.0980	7/8	4	3-1/2	.0928	183247	20.00	186459	21.37
2.5mm	.0984	7/8	4	3-1/2	.0928	183258	20.00	186470	21.37
#39	.0995	7/8	4	3-1/2	.0928	183269	20.00	186481	21.37
#38	.1015	7/8	4	3-1/2	.0950	183280	20.00	186492	21.37
#37	.1040	7/8	4	3-1/2	.0950	183291	20.00	186503	21.37
#36	.1065	7/8	4	3-1/2	.1030	183302	20.00	186514	21.37

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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



# Chucking Reamers

## STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
7/64	.1094	7/8	4	3-1/2	.1030	183313	20.62	186525	22.03
#35	.1100	7/8	4	3-1/2	.1030	183324	20.62	186536	22.03
#34	.1110	7/8	4	3-1/2	.1055	183335	20.62	186547	22.03
#33	.1130	7/8	4	3-1/2	.1055	183346	20.62	186558	22.03
#32	.1160	7/8	4	3-1/2	.1120	183357	20.62	186569	22.03
3.0mm	.1181	7/8	4	3-1/2	.1120	183368	20.62	186580	22.03
#31	.1200	7/8	4	3-1/2	.1120	183379	20.62	186591	22.03
o/u	.1240	7/8	4	3-1/2	.1190	183390	20.62	186602	22.03
1/8	.1250	7/8	4	3-1/2	.1190	183401	16.43	186613	17.61
o/u	.1260	7/8	4	3-1/2	.1190	183412	20.62	186624	22.03
#30	.1285	7/8	4	3-1/2	.1190	183423	20.62	186635	22.03
#29	.1360	1	4	4	.1275	183434	24.61	186646	26.35
3.5mm	.1378	1	4	4	.1350	183445	24.61	186657	26.35
#28	.1405	1	4	4	.1350	183456	24.61	186668	26.35
9/64	.1406	1	4	4	.1350	183467	24.61	186679	26.35
#27	.1440	1	4	4	.1350	183478	24.61	186690	26.35
#26	.1470	1	4	4	.1430	183489	24.61	186701	26.35
#25	.1495	1	4	4	.1430	183500	24.61	186712	26.35
#24	.1520	1	4	4	.1460	183511	24.61	186723	26.35
#23	.1540	1	4	4	.1460	183522	24.61	186734	26.35
5/32	.1562	1	4	4	.1510	183533	24.61	186745	26.35
#22	.1570	1	6	4	.1510	183544	24.61	186756	26.35
4.0mm	.1575	1	6	4	.1510	183555	24.61	186767	26.35
#21	.1590	1-1/8	6	4-1/2	.1530	183566	26.28	186778	28.11
#20	.1610	1-1/8	6	4-1/2	.1530	183577	26.28	186789	28.11
#19	.1660	1-1/8	6	4-1/2	.1595	183588	26.28	186800	28.11
#18	.1695	1-1/8	6	4-1/2	.1595	183599	26.28	186811	28.11
11/64	.1719	1-1/8	6	4-1/2	.1645	183610	26.28	186822	28.11
#17	.1730	1-1/8	6	4-1/2	.1645	183621	26.28	186833	28.11
#16	.1770	1-1/8	6	4-1/2	.1704	183632	26.28	186844	28.11
4.5mm	.1772	1-1/8	6	4-1/2	.1704	183643	26.28	186855	28.11
#15	.1800	1-1/8	6	4-1/2	.1755	183654	26.28	186866	28.11
#14	.1820	1-1/8	6	4-1/2	.1755	183665	26.28	186877	28.11
#13	.1850	1-1/8	6	4-1/2	.1805	183676	26.28	186888	28.11
o/u	.1865	1-1/8	6	4-1/2	.1805	183687	26.28	186899	28.11
3/16	.1875	1-1/8	6	4-1/2	.1805	183698	23.63	186910	27.16
o/u	.1885	1-1/8	6	4-1/2	.1805	183709	26.28	186921	28.11
#12	.1890	1-1/8	6	4-1/2	.1805	183720	26.28	186932	28.11
#11	.1910	1-1/4	6	5	.1860	183731	29.42	186943	33.97
#10	.1935	1-1/4	6	5	.1860	183742	29.42	186954	33.97
#9	.1960	1-1/4	6	5	.1895	183753	29.42	186965	33.97
5.0mm	.1969	1-1/4	6	5	.1895	183764	29.42	186976	33.97
#8	.1990	1-1/4	6	5	.1895	183775	29.42	186987	33.97
#7	.2010	1-1/4	6	5	.1895	183786	29.42	186998	33.97
13/64	.2031	1-1/4	6	5	.1945	183797	29.42	187009	33.97
#6	.2040	1-1/4	6	5	.1945	183808	29.42	187020	33.97
#5	.2055	1-1/4	6	5	.2016	183819	29.42	187031	33.97
#4	.2090	1-1/4	6	5	.2016	183830	29.42	187042	33.97
#3	.2130	1-1/4	6	5	.2075	183841	29.42	187053	33.97
5.5mm	.2165	1-1/4	6	5	.2075	183852	29.42	187064	33.97
7/32	.2188	1-1/4	6	5	.2075	183863	29.42	187075	33.97
#2	.2210	1-1/2	6	6	.2173	183874	30.24	187086	34.95
#1	.2280	1-1/2	6	6	.2173	183885	30.24	187097	34.95
A	.2340	1-1/2	6	6	.2265	183896	30.24	187108	34.95
15/64	.2344	1-1/2	6	6	.2265	183907	30.24	187119	34.95

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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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Chucking Reamers



## STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
6.0mm	.2362	1-1/2	6	6	.2265	183918	31.88	187130	35.12
B	.2380	1-1/2	6	6	.2329	183929	31.88	187141	35.12
C	.2420	1-1/2	6	6	.2329	183940	31.88	187152	35.12
D	.2460	1-1/2	6	6	.2329	183951	31.88	187163	31.91
o/u	.2490	1-1/2	6	6	.2405	183962	28.70	187174	31.58
1/4	.2500	1-1/2	6	6	.2405	183973	27.07	187185	29.85
o/u	.2510	1-1/2	6	6	.2405	183984	28.70	187196	31.61
6.5mm	.2559	1-1/2	6	6	.2405	183995	31.88	187207	35.12
F	.2570	1-1/2	6	6	.2485	184006	31.88	187218	35.12
G	.2610	1-1/2	6	6	.2485	184017	31.88	187229	35.12
17/64	.2656	1-1/2	6	6	.2485	184028	35.51	187240	47.62
H	.2660	1-1/2	6	6	.2485	184039	35.51	187251	47.62
I	.2720	1-1/2	6	6	.2485	184050	35.51	187262	47.62
7.0mm	.2756	1-1/2	6	6	.2485	184061	35.51	187273	47.62
J	.2770	1-1/2	6	6	.2485	184072	35.51	187284	47.62
K	.2810	1-1/2	6	6	.2485	184083	35.51	187295	47.62
9/32	.2812	1-1/2	6	6	.2485	184094	33.71	187306	45.23
L	.2900	1-1/2	6	6	.2792	184105	35.51	187317	47.62
M	.2950	1-1/2	6	6	.2792	184116	35.51	187328	47.62
7.5mm	.2953	1-1/2	6	6	.2792	184127	35.51	187339	47.62
19/64	.2969	1-1/2	6	6	.2792	184138	35.51	187350	47.62
N	.3020	1-1/2	6	6	.2792	184149	35.51	187361	47.62
o/u	.3115	1-1/2	6	6	.2792	184160	33.71	187372	45.23
5/16	.3125	1-1/2	6	6	.2792	184171	32.01	187383	42.84
o/u	.3135	1-1/2	6	6	.2792	184182	33.71	187394	45.23
8.0mm	.3150	1-1/2	6	6	.2792	184193	35.51	187405	47.62
O	.3160	1-1/2	6	6	.2792	184204	35.51	187416	47.62
P	.3230	1-1/2	6	6	.2792	184215	37.96	187427	51.32
21/64	.3281	1-1/2	6	6	.2792	184226	37.96	187438	51.32
Q	.3320	1-1/2	6	6	.2792	184237	37.96	187449	51.32
8.5mm	.3346	1-1/2	6	6	.2792	184248	37.96	187460	51.32
R	.3390	1-1/2	6	6	.2792	184259	37.96	187471	51.32
11/32	.3438	1-1/2	6	6	.2792	184270	37.96	187482	51.32
S	.3480	1-3/4	6	6	.3105	184281	38.36	187493	52.17
9.0mm	.3543	1-3/4	6	7	.3105	184292	38.36	187504	52.17
T	.3580	1-3/4	6	7	.3105	184303	38.36	187515	52.17
23/64	.3594	1-3/4	6	7	.3105	184314	38.36	187526	52.17
U	.3680	1-3/4	6	7	.3105	184325	38.36	187537	52.17
9.5mm-o/u	.3740	1-3/4	6	7	.3105	184336	36.43	187548	49.52
3/8	.3750	1-3/4	6	7	.3105	184347	34.46	187559	46.93
o/u	.3760	1-3/4	6	7	.3105	184358	36.43	187570	49.52
V	.3770	1-3/4	6	7	.3105	184369	41.69	187581	63.59
W	.3860	1-3/4	6	7	.3105	184380	41.69	187592	63.59
25/64	.3906	1-3/4	6	7	.3105	184391	41.69	187603	63.59
10.0mm	.3937	1-3/4	6	7	.3105	184402	41.69	187614	63.59
X	.3970	1-3/4	6	7	.3105	184413	41.69	187625	63.59
Y	.4040	1-3/4	6	7	.3105	184424	43.27	187636	63.59
13/32	.4062	1-3/4	6	7	.3105	184435	43.27	187647	63.59
Z	.4130	1-3/4	6	7	.3730	184446	43.27	187658	63.59
10.5mm	.4134	1-3/4	6	7	.3730	184457	43.69	187669	63.59
27/64	.4219	1-3/4	6	7	.3730	184468	43.27	187680	63.59
11.0mm	.4331	1-3/4	6	7	.3730	184479	43.27	187691	63.59
o/u	.4365	1-3/4	6	7	.3730	184490	41.11	187702	63.59
7/16	.4375	1-3/4	6	7	.3730	184501	41.11	187713	63.59
o/u	.4385	1-3/4	6	7	.3730	184512	41.11	187724	63.59

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THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -.0000	+0.0003, -.0000	+0.0001, +0.0004	+0.0002, +0.0006



# Chucking Reamers

## STRAIGHT SHANK - STRAIGHT FLUTE



### HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
11.5mm	.4528	1-3/4	6	7	.3730	184523	47.13	187735	72.88
29/64	.4531	1-3/4	6	7	.3730	184534	47.13	187746	72.88
15/32	.4688	1-3/4	6	7	.3730	184545	47.13	187757	72.88
12.0mm	.4724	2	6	8	.4355	184556	47.13	187768	72.88
31/64	.4844	2	6	8	.4355	184567	47.13	187779	72.88
12.5mm	.4921	2	6	8	.4355	184578	47.13	187790	72.88
o/u	.4990	2	6	8	.4355	184589	44.74	187801	72.88
1/2	.5000	2	6	8	.4355	184600	44.74	187812	72.88
o/u	.5010	2	6	8	.4355	184611	44.74	187823	72.88
13.0mm	.5118	2	6	8	.4355	184622	58.39	-	-
33/64	.5156	2	6	8	.4355	184633	58.39	-	-
17/32	.5312	2	6	8	.4355	184644	55.60	187834	81.75
13.5mm	.5315	2	6	8	.4355	184655	58.39	-	-
35/64	.5469	2	8	8	.4355	184666	58.39	-	-
14.0mm	.5512	2	8	8	.4355	184677	58.39	-	-
o/u	.5615	2	8	8	.4355	184688	58.39	-	-
9/16	.5625	2	8	8	.4355	184699	55.60	187845	81.75
o/u	.5635	2	8	8	.4355	184710	58.39	-	-
14.5mm	.5709	2	8	8	.4355	184721	58.39	-	-
37/64	.5781	2	8	8	.4355	184732	58.39	-	-
15.0mm	.5906	2	8	8	.4355	184743	58.39	-	-
19/32	.5938	2	8	8	.4355	184754	55.60	187856	81.75
39/64	.6094	2-1/4	8	9	.5615	184765	68.14	-	-
15.5mm	.6102	2-1/4	8	9	.5615	184776	68.14	-	-
o/u	.6240	2-1/4	8	9	.5615	184787	68.14	-	-
5/8	.6250	2-1/4	8	9	.5615	184798	65.13	187867	95.40
o/u	.6260	2-1/4	8	9	.5615	184809	68.14	-	-
16.0mm	.6299	2-1/4	8	9	.5615	184820	68.14	-	-
41/64	.6406	2-1/4	8	9	.5615	184831	68.14	-	-
16.5mm	.6496	2-1/4	8	9	.5615	184842	68.14	-	-
21/32	.6562	2-1/4	8	9	.5615	184853	73.37	187878	107.84
17.0mm	.6693	2-1/4	8	9	.5615	184864	77.01	-	-
43/64	.6719	2-1/4	8	9	.5615	184875	77.01	-	-
o/u	.6865	2-1/4	8	9	.5615	184886	77.01	-	-
11/16	.6875	2-1/4	8	9	.5615	184897	73.37	187889	107.84
o/u	.6885	2-1/4	8	9	.5615	184908	82.67	-	-
17.5mm	.6890	2-1/4	8	9	.5615	184919	82.67	-	-
45/64	.7031	2-1/4	8	9	.5615	184930	82.67	-	-
18.0mm	.7087	2-1/4	8	9	.5615	184941	82.67	-	-
23/32	.7188	2-1/4	8	9	.5615	184952	81.88	187900	120.37
18.5mm	.7283	2-1/2	8	9	.6240	184963	85.94	-	-
47/64	.7344	2-1/2	8	9	.6240	184974	95.20	-	-
19.0mm	.7480	2-1/2	8	9	.6240	184985	95.20	-	-
o/u	.7490	2-1/2	8	9	.6240	184996	95.20	-	-
3/4	.7500	2-1/2	8	9	.6240	185007	82.37	187911	121.06
o/u	.7510	2-1/2	8	9	.6240	185018	91.64	-	-
49/64	.7656	2-1/2	8	9	.6240	185029	91.64	-	-
19.5mm	.7677	2-1/2	8	9	.6240	185040	91.64	-	-
25/32	.7812	2-1/2	8	9	.6240	185051	88.82	187922	130.55
20.0mm	.7874	2-1/2	8	9	.6240	185062	98.12	-	-
51/64	.7969	2-1/2	8	9	.6240	185073	98.12	-	-
20.5mm	.8071	2-1/2	8	9	.6240	185084	98.12	-	-
o/u	.8115	2-1/2	8	9	.6240	185095	98.12	-	-
13/16	.8125	2-1/2	8	9	.6240	185106	88.82	187933	130.55
o/u	.8135	2-1/2	8	9	.6240	185117	98.12	-	-

CONTINUED ON NEXT PAGE

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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
**HSS & COBALT REAMERS**

# Chucking Reamers



## STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
21.0mm	.8268	2-1/2	8	9-1/2	.6240	185128	98.12	-	-
53/64	.8281	2-1/2	8	9-1/2	.6240	185139	98.12	-	-
27/32	.8438	2-1/2	8	9-1/2	.6240	185150	105.09	187944	154.47
21.5mm	.8465	2-5/8	8	10	.7490	185161	114.38	-	-
55/64	.8594	2-5/8	8	10	.7490	185172	114.38	-	-
22.0mm	.8661	2-5/8	8	10	.7490	185183	114.38	-	-
o/u	.8740	2-5/8	8	10	.7490	185194	114.38	-	-
7/8	.8750	2-5/8	8	10	.7490	185205	107.51	187955	158.07
o/u	.8760	2-5/8	8	10	.7490	185216	116.84	-	-
22.5mm	.8858	2-5/8	8	10	.7490	185227	116.84	-	-
57/64	.8906	2-5/8	8	10	.7490	185238	116.84	-	-
23.0mm	.9055	2-5/8	8	10	.7490	185249	116.84	-	-
29/32	.9062	2-5/8	8	10	.7490	185260	115.89	187966	170.31
59/64	.9219	2-5/8	8	10	.7490	185271	125.12	-	-
23.5mm	.9252	2-5/8	8	10	.7490	185282	125.12	-	-
o/u	.9365	2-5/8	8	10	.7490	185293	125.12	-	-
15/16	.9375	2-5/8	8	10	.7490	185304	115.89	187977	170.31
o/u	.9385	2-5/8	8	10	.7490	185315	125.12	-	-
24.0mm	.9449	2-5/8	8	10	.7490	185326	125.12	-	-
61/64	.9531	2-5/8	8	10	.7490	185337	125.12	-	-
24.5mm	.9646	2-5/8	8	10	.7490	185348	125.12	-	-
31/32	.9688	2-5/8	8	10	.7490	185359	129.80	187988	190.73
25.0mm	.9843	2-3/4	8	10-1/2	.8740	185370	132.84	-	-
63/64	.9844	2-3/4	8	10-1/2	.8740	185381	132.84	-	-
o/u	.9990	2-3/4	8	10-1/2	.8740	185392	132.84	-	-
1	1.0000	2-3/4	8	10-1/2	.8740	185403	131.01	187999	192.53
o/u	1.0010	2-3/4	8	10-1/2	.8740	185414	140.27	-	-
1-1/32	1.0312	2-3/4	8	10-1/2	.8740	185425	182.26	-	-
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	185436	145.21	188010	213.45
1-3/32	1.0938	2-7/8	8	11	.8740	185447	191.42	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	185458	154.34	188021	226.83
1-5/32	1.1562	2-7/8	10	11	.9990	185469	217.80	-	-
1-3/16	1.1875	2-7/8	10	11	.9990	185480	180.75	188032	265.71
1-7/32	1.2188	3	10	11-1/2	.9990	185491	228.63	-	-
1-1/4	1.2500	3	10	11-1/2	.9990	185502	191.55	188043	281.55
1-9/32	1.2812	3	10	11-1/2	.9990	185513	260.54	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	185524	223.43	188054	328.39
1-11/32	1.3438	3-1/4	10	12	.9990	185535	271.87	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	185546	234.79	188065	345.14
1-13/32	1.4062	3-1/4	10	12	1.2490	185557	288.85	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	185568	251.77	188076	370.18
1-15/32	1.4688	3-1/2	10	12-1/2	1.2490	185579	308.23	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	185590	271.11	188087	398.55
1-9/16	1.5625	3-1/2	12	13	1.2490	192124	383.83	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192135	383.83	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192146	440.80	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192157	440.80	-	-
1-13/16	1.8125	4	12	14	1.4990	192168	507.70	-	-
1-7/8	1.8750	4	12	14	1.4990	192179	507.70	-	-
1-15/16	1.9375	4	12	14	1.4990	192190	595.37	-	-
2	2.0000	4	12	14	1.4990	192201	595.37	-	-

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.002, -.0000	+0.003, -.0000	+0.001, +.0004	+0.002, +.0006



# Chucking Reamers

## INTERMEDIATE SIZES - HIGH SPEED STEEL

DEC SIZE	ITEM#	LIST PRICE	DEC SIZE	ITEM#	LIST PRICE	DEC SIZE	ITEM#	LIST PRICE	DEC SIZE	ITEM#	LIST PRICE	DEC SIZE	ITEM#	LIST PRICE	DEC SIZE	ITEM#	LIST PRICE			
0.0100	172269	36.59	0.0570	173017	28.80	0.0985	173765	25.82	0.1390	174513	30.27	0.1805	175261	28.44	0.2230	176009	35.57	0.2620	176757	40.91
0.0105	172280	36.59	0.0575	173028	28.80	0.0990	173776	25.82	0.1395	174524	30.27	0.1810	175272	28.44	0.2235	176020	35.57	0.2625	176768	40.91
0.0110	172291	36.59	0.0580	173039	28.80	0.1000	173787	25.82	0.1400	174535	30.27	0.1815	175283	28.44	0.2240	176031	35.57	0.2630	176779	40.91
0.0115	172302	36.59	0.0585	173050	28.80	0.1005	173798	25.82	0.1410	174546	28.80	0.1825	175294	28.44	0.2245	176042	35.57	0.2635	176790	40.91
0.0120	172313	36.59	0.0590	173061	28.80	0.1010	173809	25.82	0.1415	174557	28.80	0.1830	175305	28.44	0.2250	176053	35.57	0.2640	176801	40.91
0.0125	172324	36.59	0.0600	173072	28.80	0.1020	173820	25.82	0.1420	174568	28.80	0.1835	175316	28.44	0.2255	176064	35.57	0.2645	176812	40.91
0.0130	172335	36.59	0.0605	173083	28.80	0.1025	173831	25.82	0.1425	174579	28.80	0.1840	175327	28.44	0.2260	176075	35.57	0.2650	176823	40.91
0.0140	172346	36.59	0.0610	173094	28.80	0.1030	173842	25.82	0.1430	174590	28.80	0.1845	175338	28.44	0.2265	176086	35.57	0.2655	176834	40.91
0.0150	172357	36.59	0.0615	173105	28.80	0.1035	173853	25.82	0.1435	174601	28.80	0.1855	175349	28.44	0.2270	176097	35.57	0.2665	176845	40.91
0.0155	172368	36.59	0.0620	173116	28.80	0.1045	173864	25.82	0.1445	174612	28.80	0.1860	175360	28.44	0.2275	176108	35.57	0.2670	176856	40.91
0.0165	172379	36.59	0.0630	173127	25.82	0.1050	173875	25.82	0.1450	174623	28.80	0.1870	175371	28.44	0.2285	176119	35.57	0.2675	176867	40.91
0.0170	172390	36.59	0.0640	173138	25.82	0.1055	173886	25.82	0.1455	174634	28.80	0.1880	175382	35.90	0.2290	176130	35.57	0.2680	176878	40.91
0.0175	172401	36.59	0.0645	173149	25.82	0.1060	173897	25.82	0.1460	174645	28.80	0.1895	175393	35.90	0.2295	176141	35.57	0.2685	176889	40.91
0.0185	172412	36.59	0.0650	173160	25.82	0.1070	173908	25.82	0.1465	174656	28.80	0.1900	175404	35.90	0.2300	176152	35.57	0.2690	176900	40.91
0.0190	172423	36.59	0.0655	173171	25.82	0.1075	173919	25.82	0.1475	174667	28.80	0.1905	175415	35.90	0.2305	176163	35.57	0.2695	176911	40.91
0.0195	172434	36.59	0.0660	173182	25.82	0.1080	173930	25.82	0.1480	174678	28.80	0.1915	175426	35.90	0.2310	176174	35.57	0.2700	176922	40.91
0.0205	172445	33.32	0.0665	173193	25.82	0.1085	173941	25.82	0.1485	174689	28.80	0.1920	175437	35.90	0.2315	176185	35.57	0.2705	176933	40.91
0.0215	172456	33.32	0.0675	173204	25.82	0.1090	173952	25.82	0.1490	174700	28.80	0.1925	175448	35.90	0.2320	176196	35.57	0.2710	176944	40.91
0.0220	172467	33.32	0.0680	173215	25.82	0.1095	173963	22.32	0.1500	174711	28.80	0.1930	175459	35.90	0.2325	176207	35.57	0.2715	176955	40.91
0.0230	172478	33.32	0.0685	173226	25.82	0.1105	173974	22.32	0.1505	174722	28.80	0.1940	175470	35.90	0.2330	176218	35.57	0.2720	176966	40.91
0.0235	172489	33.32	0.0690	173237	25.82	0.1115	173985	22.32	0.1510	174733	28.80	0.1945	175481	35.90	0.2335	176229	35.57	0.2725	176977	40.91
0.0245	172500	33.32	0.0695	173248	25.82	0.1120	173996	22.32	0.1515	174744	28.80	0.1950	175492	35.90	0.2345	176240	32.07	0.2735	176988	40.91
0.0255	172511	33.32	0.0705	173259	25.82	0.1125	174007	22.32	0.1525	174755	28.80	0.1955	175503	35.90	0.2350	176251	32.07	0.2740	176999	40.91
0.0265	172522	33.32	0.0710	173270	25.82	0.1135	174018	22.32	0.1530	174766	28.80	0.1965	175514	35.90	0.2355	176262	32.07	0.2745	177010	40.91
0.0270	172533	33.32	0.0715	173281	25.82	0.1140	174029	22.32	0.1535	174777	28.80	0.1970	175525	35.90	0.2360	176273	32.07	0.2750	177021	40.91
0.0275	172544	33.32	0.0720	173292	25.82	0.1145	174040	22.32	0.1545	174788	28.80	0.1975	175536	35.90	0.2365	176284	32.07	0.2755	177032	40.91
0.0285	172555	33.32	0.0725	173303	25.82	0.1150	174051	22.32	0.1550	174799	28.80	0.1980	175547	35.90	0.2370	176295	32.07	0.2760	177043	40.91
0.0290	172566	33.32	0.0735	173314	25.82	0.1155	174062	22.32	0.1555	174810	28.80	0.1985	175558	35.90	0.2375	176306	32.07	0.2765	177054	40.91
0.0295	172577	30.27	0.0740	173325	25.82	0.1165	174073	22.32	0.1560	174821	28.80	0.1995	175569	35.90	0.2385	176317	32.07	0.2775	177065	40.91
0.0300	172588	30.27	0.0745	173336	25.82	0.1170	174084	22.32	0.1565	174832	30.27	0.2000	175580	35.90	0.2390	176328	32.07	0.2780	177076	40.91
0.0305	172599	30.27	0.0750	173347	25.82	0.1175	174095	22.32	0.1580	174843	30.27	0.2005	175591	35.90	0.2395	176339	32.07	0.2785	177087	40.91
0.0315	172610	30.27	0.0755	173358	25.82	0.1180	174106	22.32	0.1585	174854	30.27	0.2015	175602	35.90	0.2400	176350	32.07	0.2790	177098	40.91
0.0325	172621	30.27	0.0765	173369	25.82	0.1185	174117	22.32	0.1595	174865	30.27	0.2020	175613	35.90	0.2405	176361	32.07	0.2795	177109	40.91
0.0335	172632	30.27	0.0770	173380	25.82	0.1190	174128	22.32	0.1600	174876	30.27	0.2025	175624	35.90	0.2410	176372	32.07	0.2800	177120	40.91
0.0340	172643	30.27	0.0775	173391	25.82	0.1195	174139	22.32	0.1605	174887	30.27	0.2030	175635	35.90	0.2415	176383	32.07	0.2805	177131	40.91
0.0345	172654	30.27	0.0780	173402	25.82	0.1205	174150	22.32	0.1615	174898	30.27	0.2035	175646	34.99	0.2425	176394	32.07	0.2815	177142	40.91
0.0355	172665	30.27	0.0790	173413	25.82	0.1210	174161	22.32	0.1620	174909	30.27	0.2045	175657	34.99	0.2430	176405	32.07	0.2820	177153	40.91
0.0365	172676	30.27	0.0795	173424	25.82	0.1215	174172	22.32	0.1625	174920	30.27	0.2050	175668	34.99	0.2435	176416	32.07	0.2825	177164	40.91
0.0375	172687	30.27	0.0800	173435	25.82	0.1220	174183	22.32	0.1630	174931	30.27	0.2060	175679	34.99	0.2440	176427	32.07	0.2830	177175	40.91
0.0385	172698	30.27	0.0805	173446	25.82	0.1225	174194	22.32	0.1635	174942	30.27	0.2065	175690	34.99	0.2445	176438	32.07	0.2835	177186	40.91
0.0395	172709	28.80	0.0815	173457	25.82	0.1230	174205	22.32	0.1640	174953	30.27	0.2070	175701	34.99	0.2450	176449	32.07	0.2840	177197	40.91
0.0405	172720	28.80	0.0825	173468	25.82	0.1235	174216	22.32	0.1645	174964	30.27	0.2075	175712	34.99	0.2455	176460	32.07	0.2845	177208	40.91
0.0415	172731	28.80	0.0830	173479	25.82	0.1245	174227	22.32	0.1650	174975	30.27	0.2080	175723	34.99	0.2465	176471	32.07	0.2850	177219	40.91
0.0425	172742	28.80	0.0835	173490	25.82	0.1247	174238	22.32	0.1655	174986	30.27	0.2085	175734	34.99	0.2470	176482	32.07	0.2855	177230	40.91
0.0435	172753	28.80	0.0840	173501	25.82	0.1255	174249	30.27	0.1665	174997	30.27	0.2095	175745	34.99	0.2475	176493	32.07	0.2860	177241	40.91
0.0440	172764	28.80	0.0845	173512	25.82	0.1265	174260	30.27	0.1670	175008	30.27	0.2100	175756	34.99	0.2480	176504	32.07	0.2865	177252	40.91
0.0445	172775	28.80	0.0850	173523	25.82	0.1270	174271	30.27	0.1675	175019	30.27	0.2105	175767	34.99	0.2485	176515	32.07	0.2870	177263	40.91
0.0450	172786	28.80	0.0855	173534	25.82	0.1275	174282	30.27	0.1680	175030	30.27	0.2110	175778	34.99	0.2495	176526	32.07	0.2875	177274	40.91
0.0455	172797	28.80	0.0865	173545	25.82	0.1280	174293	30.27	0.1685	175041	30.27	0.2115	175789	34.99	0.2505	176537	40.91	0.2880	177285	40.91
0.0460	172808	28.80	0.0870	173556	25.82	0.1290	174304	30.27	0.1690	175052	30.27	0.2120	175800	34.99	0.2515	176548	40.91	0.2885	177296	40.91
0.0470	172819	28.80	0.0875	173567	25.82	0.1295	174315	30.27	0.1700	175063	30.27	0.2125	175811	34.99	0.2520	176559	40.91	0.2890	177307	40.91
0.0475	172830	28.80	0.0880	173578	25.82	0.1300	174326	30.27	0.1705	175074	30.27	0.2135	175822	34.99	0.2525	176570	40.91	0.2895	177318	40.91
0.0480	172841	28.80	0.0885	173589	25.82	0.1305	174337	30.27	0.17											

# Chucking Reamers



## INTERMEDIATE SIZES - HIGH SPEED STEEL

DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE			
0.2990	177505	36.62	0.3370	178253	43.13	0.3730	179001	39.21	0.4105	179749	48.40	0.4465	180497	51.48	0.4805	181245	51.48	0.6270	181993	82.18
0.2995	177516	36.62	0.3375	178264	43.13	0.3735	179012	39.21	0.4110	179760	48.40	0.4470	180508	51.48	0.4810	181256	51.48	0.6275	182004	82.18
0.3000	177527	36.62	0.3380	178275	43.13	0.3745	179023	39.21	0.4115	179771	48.40	0.4475	180519	51.48	0.4815	181267	51.48	0.6280	182015	82.18
0.3005	177538	36.62	0.3385	178286	43.13	0.3755	179034	47.19	0.4120	179782	48.40	0.4480	180530	51.48	0.4820	181278	51.48	0.6300	182697	82.18
0.3010	177549	36.62	0.3395	178297	43.13	0.3765	179045	47.19	0.4125	179793	48.40	0.4485	180541	51.48	0.4825	181289	51.48	0.6845	182026	82.18
0.3015	177560	36.62	0.3400	178308	43.13	0.3775	179056	47.19	0.4135	179804	48.40	0.4490	180552	51.48	0.4830	181300	51.48	0.6850	182037	82.18
0.3025	177571	36.62	0.3405	178319	43.13	0.3780	179067	47.19	0.4140	179815	48.40	0.4495	180563	51.48	0.4835	181311	51.48	0.6855	182048	82.18
0.3030	177582	36.62	0.3410	178330	43.13	0.3785	179078	47.19	0.4145	179826	48.40	0.4500	180574	51.48	0.4840	181322	51.48	0.6860	182059	82.18
0.3035	177593	36.62	0.3415	178341	43.13	0.3790	179089	47.19	0.4150	179837	48.40	0.4505	180585	51.48	0.4845	181333	48.40	0.6870	182070	82.18
0.3040	177604	36.62	0.3420	178352	43.13	0.3795	179100	47.19	0.4155	179848	48.40	0.4510	180596	51.48	0.4850	181344	48.40	0.6880	182081	90.59
0.3045	177615	36.62	0.3425	178363	43.13	0.3800	179111	47.19	0.4160	179859	48.40	0.4515	180607	51.48	0.4855	181355	48.40	0.6895	182092	90.59
0.3050	177626	36.62	0.3430	178374	43.13	0.3805	179122	47.19	0.4165	179870	48.40	0.4520	180618	51.48	0.4860	181366	48.40	0.6900	182103	90.59
0.3055	177637	36.62	0.3435	178385	43.13	0.3810	179133	47.19	0.4170	179881	48.40	0.4525	180629	51.48	0.4865	181377	48.40	0.6905	182114	90.59
0.3060	177648	36.62	0.3440	178396	43.76	0.3815	179144	47.19	0.4175	179892	48.40	0.4530	180640	51.48	0.4870	181388	48.40	0.7470	182125	96.25
0.3065	177659	36.62	0.3445	178407	43.76	0.3820	179155	47.19	0.4180	179903	48.40	0.4535	180651	51.48	0.4875	181399	48.40	0.7475	182136	96.25
0.3070	177670	36.62	0.3450	178418	43.76	0.3825	179166	47.19	0.4185	179914	48.40	0.4540	180662	51.48	0.4880	181410	48.40	0.7485	182147	96.25
0.3075	177681	36.62	0.3455	178429	43.76	0.3830	179177	47.19	0.4190	179925	48.40	0.4545	180673	51.48	0.4885	181421	48.40	0.7495	182158	96.25
0.3080	177692	36.62	0.3460	178440	43.76	0.3835	179188	47.19	0.4195	179936	48.40	0.4550	180684	51.48	0.4890	181432	48.40	0.7505	182169	104.47
0.3085	177703	36.62	0.3465	178451	43.76	0.3840	179199	47.19	0.4200	179947	48.40	0.4555	180695	51.48	0.4895	181443	48.40	0.7515	182180	104.47
0.3090	177714	36.62	0.3470	178462	43.76	0.3845	179210	47.19	0.4205	179958	48.40	0.4560	180706	51.48	0.4900	181454	48.40	0.7520	182191	104.47
0.3095	177725	36.62	0.3475	178473	43.76	0.3850	179221	47.19	0.4210	179969	48.40	0.4565	180717	51.48	0.4905	181465	48.40	0.7525	182202	104.47
0.3100	177736	36.62	0.3485	178484	43.76	0.3855	179232	47.19	0.4215	179980	48.40	0.4570	180728	51.48	0.4910	181476	48.40	0.7530	182213	104.47
0.3105	177747	36.62	0.3490	178495	43.76	0.3865	179243	47.19	0.4220	179991	45.39	0.4575	180739	51.48	0.4915	181487	48.40	0.7540	182224	104.47
0.3110	177758	36.62	0.3495	178506	43.76	0.3870	179254	47.19	0.4225	180002	45.39	0.4580	180750	51.48	0.4920	181498	48.40	0.7550	182235	104.47
0.3120	177769	36.62	0.3500	178517	43.76	0.3875	179265	47.19	0.4230	180013	45.39	0.4585	180761	51.48	0.4925	181509	48.40	0.8095	182246	104.47
0.3130	177780	43.13	0.3505	178528	43.76	0.3880	179276	47.19	0.4235	180024	45.39	0.4590	180772	51.48	0.4930	181520	48.40	0.8100	182257	104.47
0.3140	177791	43.13	0.3510	178539	43.76	0.3885	179287	47.19	0.4240	180035	45.39	0.4595	180783	51.48	0.4935	181531	48.40	0.8105	182268	104.47
0.3145	177802	43.13	0.3515	178550	43.76	0.3890	179298	47.19	0.4245	180046	45.39	0.4600	180794	51.48	0.4940	181542	48.40	0.8110	182279	104.47
0.3155	177813	43.13	0.3520	178561	43.76	0.3895	179309	47.19	0.4250	180057	45.39	0.4605	180805	51.48	0.4945	181553	48.40	0.8120	182290	104.47
0.3165	177824	43.13	0.3525	178572	43.76	0.3900	179320	47.19	0.4255	180068	45.39	0.4610	180816	51.48	0.4950	181564	48.40	0.8130	182301	115.04
0.3170	177835	43.13	0.3530	178583	43.76	0.3905	179331	47.19	0.4260	180079	45.39	0.4615	180827	51.48	0.4955	181575	48.40	0.8140	182312	115.04
0.3175	177846	43.13	0.3535	178594	43.76	0.3910	179342	48.40	0.4265	180090	45.39	0.4620	180838	51.48	0.4960	181586	48.40	0.8145	182323	115.04
0.3180	177857	43.13	0.3540	178605	43.76	0.3915	179353	48.40	0.4270	180101	45.39	0.4625	180849	51.48	0.4965	181597	48.40	0.8150	182334	115.04
0.3185	177868	43.13	0.3545	178616	43.76	0.3920	179364	48.40	0.4275	180112	45.39	0.4630	180860	51.48	0.4970	181608	48.40	0.8155	182345	115.04
0.3190	177879	43.13	0.3550	178627	43.76	0.3925	179375	48.40	0.4280	180123	45.39	0.4635	180871	51.48	0.4975	181619	48.40	0.8720	182356	118.01
0.3195	177890	43.13	0.3555	178638	43.76	0.3930	179386	48.40	0.4285	180134	45.39	0.4640	180882	51.48	0.4980	181630	48.40	0.8725	182367	118.01
0.3200	177901	43.13	0.3560	178649	43.76	0.3935	179397	48.40	0.4290	180145	45.39	0.4645	180893	51.48	0.4985	181641	48.40	0.8730	182378	118.01
0.3205	177912	43.13	0.3565	178660	43.76	0.3940	179408	48.40	0.4295	180156	45.39	0.4650	180904	51.48	0.4995	181652	48.40	0.8735	182389	118.01
0.3210	177923	43.13	0.3570	178671	43.76	0.3945	179419	48.40	0.4300	180167	45.39	0.4655	180915	51.48	0.5005	181663	65.13	0.8745	182400	118.01
0.3215	177934	43.13	0.3575	178682	43.76	0.3950	179430	48.40	0.4305	180178	45.39	0.4660	180926	51.48	0.5015	181674	65.13	0.8755	182411	128.59
0.3220	177945	43.13	0.3585	178693	43.76	0.3955	179441	48.40	0.4310	180189	45.39	0.4665	180937	51.48	0.5020	181685	65.13	0.8765	182422	128.59
0.3225	177956	43.13	0.3590	178704	43.76	0.3960	179452	48.40	0.4315	180200	45.39	0.4670	180948	51.48	0.5025	181696	65.13	0.8770	182433	128.59
0.3235	177967	43.13	0.3595	178715	39.21	0.3965	179463	48.40	0.4320	180211	45.39	0.4675	180959	51.48	0.5030	181707	65.13	0.8775	182444	128.59
0.3240	177978	43.13	0.3600	178726	39.21	0.3975	179474	48.40	0.4325	180222	45.39	0.4680	180970	51.48	0.5035	181718	65.13	0.8780	182455	128.59
0.3245	177989	43.13	0.3605	178737	39.21	0.3980	179485	48.40	0.4330	180233	45.39	0.4685	180981	51.48	0.5040	181729	65.13	0.9340	182466	128.59
0.3250	178000	43.13	0.3610	178748	39.21	0.3985	179496	48.40	0.4335	180244	45.39	0.4690	180992	51.48	0.5045	181740	65.13	0.9345	182477	128.59
0.3255	178011	43.13	0.3615	178759	39.21	0.3990	179507	48.40	0.4340	180255	45.39	0.4695	181003	51.48	0.5050	181751	65.13	0.9350	182488	128.59
0.3260	178022	43.13	0.3620	178770	39.21	0.3995	179518	48.40	0.4345	180266	45.39	0.4700	181014	51.48	0.5060	181762	65.13	0.9355	182499	128.59
0.3265	178033	43.13	0.3625	178781	39.21	0.4000	179529	48.40	0.4350	180277	45.39	0.4705	181025	51.48	0.5070	181773	65.13	0.9360	182510	128.59
0.3270	178044	43.13	0.3630	178792	39.21	0.4005	179540	48.40	0.4355	180288	45.39	0.4710	181036	51.48	0.5080	181784	65.13	0.9370	182521	128.59
0.3275	178055	43.13	0.3635	178803	39.21	0.4010	179551	48.40	0.4360	180299	45.39	0.4715	181047	51.48	0.5090	181795	65.13	0.9380	182532	141.15
0.3280	178066	43.13	0.3640	178814	39.21	0.4015	179562	48.40	0.4370	180310	45.39	0.4720	181058	51.48	0.5100	181806	65.13	0.9390	182543	141.15
0.3285	178077	43.13	0.3645	178825	39.2															



# Chucking Reamers

## 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+
.0100 - .0195	176.22	115.16	85.80	56.63	51.16	43.48	39.34	36.59	35.64	32.65	31.66	31.25	30.51
.0196 - .0290	160.21	104.69	78.07	51.48	46.49	40.75	35.75	33.32	30.90	29.65	29.52	29.48	29.36
.0291 - .0390	145.64	95.01	70.94	46.76	42.24	37.08	32.53	30.27	28.06	26.97	26.21	25.83	25.22
.0391 - .0624	131.64	87.64	70.94	45.09	40.65	35.23	31.00	28.80	26.56	24.93	24.54	24.45	24.29
.0626 - .1093	138.60	88.72	68.42	42.63	37.36	30.98	28.06	25.82	23.65	22.32	21.78	21.39	20.65
.1095 - .1249	136.77	86.81	64.31	37.26	32.71	29.93	24.54	22.32	22.00	21.64	21.27	20.89	20.72
.1251 - .1405	145.64	95.01	64.14	46.76	44.03	37.08	32.53	30.27	28.06	26.97	26.28	25.83	24.97
.1407 - .1561	143.43	93.51	71.01	45.34	40.65	35.51	31.00	28.80	27.19	26.56	25.96	25.35	24.71
.1563 - .1718	145.64	90.89	70.61	46.76	42.35	37.08	32.53	30.27	28.06	27.62	27.19	26.97	26.44
.1720 - .1874	139.67	87.19	70.56	43.55	39.14	34.98	30.77	28.44	28.13	27.71	27.32	26.62	26.28
.1876 - .2030	149.56	99.64	78.20	52.34	47.88	42.56	38.07	35.90	33.45	31.66	30.98	30.77	30.52
.2032 - .2187	149.56	99.64	77.35	51.53	47.09	41.68	37.14	34.99	32.71	30.77	30.39	30.03	29.88
.2189 - .2343	150.16	100.42	77.98	52.19	47.70	42.35	37.81	35.57	33.37	32.02	31.54	31.25	31.00
.2345 - .2499	150.16	100.42	74.22	48.42	43.91	38.73	34.31	32.07	29.69	29.52	29.13	28.82	28.70
.2501 - .2968	155.96	106.03	83.52	57.73	53.30	47.61	43.13	40.91	38.54	36.53	36.19	35.87	35.51
.2970 - .3124	151.63	101.74	79.22	53.34	48.85	43.48	38.90	36.62	36.47	36.15	35.97	35.73	35.51
.3126 - .3437	159.28	108.58	85.95	55.67	53.97	49.80	45.46	43.13	40.71	38.93	38.54	38.28	37.97
.3439 - .3593	159.06	109.17	86.60	60.76	56.25	52.80	45.46	43.76	41.52	39.54	39.14	38.83	38.54
.3595 - .3749	154.49	104.45	81.94	55.96	51.53	46.08	41.64	39.21	39.00	38.93	38.67	38.48	38.35
.3751 - .3905	161.71	111.87	89.49	63.41	58.95	54.04	49.44	47.19	45.01	42.63	42.40	42.05	41.68
.3907 - .4218	163.74	113.79	91.22	65.40	60.93	55.06	50.60	48.40	46.11	44.10	43.68	43.48	43.36
.4220 - .4374	160.65	110.82	88.13	62.40	57.96	52.19	47.61	45.39	45.01	44.86	44.66	43.74	43.26
.4376 - .4843	168.09	118.12	95.61	69.79	65.33	59.20	52.54	51.48	50.35	48.78	48.42	47.88	47.45
.4845 - .4999	164.13	114.21	91.65	65.73	61.37	55.29	48.55	48.40	48.02	47.83	47.45	47.28	47.13
.5001 - .5311	238.18	147.93	117.93	87.73	80.31	72.70	67.75	65.13	62.62	61.46	60.67	60.19	59.59
.5313 - .5624	236.84	146.55	116.49	86.34	78.91	71.29	66.40	63.79	61.22	59.98	59.23	58.67	58.41
.5626 - .5937	246.17	155.86	125.75	95.61	89.88	80.64	78.01	73.24	70.56	69.41	68.61	68.10	67.40
.5939 - .6249	246.50	156.12	126.03	95.90	88.48	80.95	75.94	73.57	70.85	69.72	68.87	68.42	68.13
.6251 - .6874	255.30	165.01	134.90	104.77	97.25	93.35	84.68	82.18	79.71	78.42	77.66	77.24	77.00
.6876 - .7187	263.56	173.35	143.21	112.71	105.36	98.00	93.04	90.59	88.10	86.81	85.98	85.38	84.90
.7189 - .7499	266.89	176.60	146.65	116.43	109.06	101.48	96.37	96.25	96.15	96.06	95.71	95.51	95.20
.7501 - .8124	277.41	187.18	157.21	127.01	119.52	112.03	106.99	104.47	101.96	100.72	99.99	99.41	98.74
.8126 - .8437	288.05	197.71	167.77	137.60	130.07	122.65	117.54	115.04	112.58	111.27	110.46	110.02	109.39
.8439 - .8749	290.72	200.44	170.29	140.15	132.67	125.19	120.09	118.01	116.91	113.79	112.99	112.51	110.37
.8751 - .9374	301.64	211.34	181.25	151.12	143.66	136.23	131.09	128.59	126.16	125.78	125.55	125.36	125.13
.9376 - .9687	314.17	222.54	193.81	163.74	156.23	148.73	143.66	141.15	138.68	137.51	136.58	136.29	135.53
.9689 - .9999	316.78	226.51	196.45	166.26	158.84	151.31	146.34	143.87	141.23	140.06	139.23	138.68	138.11
1.0001 - 1.0624	339.95	253.94	244.94	235.96	226.87	217.88	208.86	199.83	190.87	189.67	185.34	183.82	182.26
1.0626 - 1.1249	359.00	273.44	263.56	253.65	243.74	233.85	224.00	214.11	204.23	194.36	193.45	192.48	191.39
1.1251 - 1.1874	383.38	299.06	288.79	278.99	269.15	259.33	249.79	239.71	231.68	220.02	210.20	200.40	190.56
1.1876 - 1.2499	404.70	319.17	308.45	297.83	287.20	276.58	265.93	255.30	244.67	234.07	223.43	212.78	202.17
1.2501 - 1.3749	460.34	370.76	359.19	347.87	336.57	323.56	313.95	302.71	291.34	280.02	277.11	274.22	271.86
1.3751 - 1.4999	509.22	422.53	409.90	397.34	384.69	372.07	359.53	346.87	334.31	321.65	318.22	313.56	308.21

THRU 1/2" DIAMETER +.0002, -.0000	ABOVE 1/2" TO 5/8" +.0003, -.0000	ABOVE 5/8" TO 1-1/2" +.0001, +.0004
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CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
**HSS REAMERS**



# Chucking Reamers

## 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+
.0100 - .0195	254.55	134.57	99.75	65.10	56.42	47.69	41.93	39.02	36.12	34.69	33.85	32.65	32.53
.0196 - .0290	231.44	122.27	90.68	59.18	51.29	43.36	38.07	35.46	32.87	32.71	32.67	32.65	32.53
.0291 - .0390	210.42	111.23	82.47	53.75	46.59	41.67	34.63	32.27	29.88	28.70	27.99	27.48	26.84
.0391 - .0624	191.57	109.55	80.82	52.07	44.88	37.71	32.96	30.57	28.16	26.98	26.82	26.60	26.36
.0626 - .1093	192.89	107.09	78.37	49.63	42.50	35.24	30.51	28.11	25.70	24.54	24.40	24.29	24.08
.1095 - .1249	188.48	102.63	73.97	45.23	38.06	30.92	26.12	24.70	23.30	22.90	22.57	22.28	22.02
.1251 - .1405	197.00	111.18	82.13	53.75	46.59	39.43	34.63	32.27	29.88	28.70	27.99	27.48	26.84
.1407 - .1561	195.37	109.55	80.82	52.07	44.88	37.71	32.96	30.57	28.16	26.98	26.62	26.53	26.34
.1563 - .1718	197.18	111.27	82.55	53.89	46.73	39.54	34.79	32.37	29.96	28.75	28.54	28.34	28.11
.1720 - .1874	195.73	109.96	81.20	52.54	46.58	38.19	33.38	31.00	28.60	28.54	28.37	28.16	28.15
.1876 - .2030	203.76	117.93	89.14	60.48	53.33	46.08	41.36	38.95	36.54	35.35	34.63	34.18	33.99
.2032 - .2343	202.89	117.11	88.40	59.66	52.54	45.39	40.55	39.30	38.03	37.63	37.39	37.08	36.50
.2345 - .2499	199.41	113.79	85.09	56.42	49.20	42.03	37.26	37.04	36.79	36.50	36.16	35.51	35.06
.2501 - .2968	217.19	131.39	102.57	73.97	66.75	59.61	54.71	52.38	50.02	48.82	48.46	47.75	47.61
.2970 - .3124	211.72	125.83	97.12	68.42	61.19	54.05	49.32	49.01	48.71	48.49	48.07	48.01	47.67
.3126 - .3437	219.88	133.99	105.25	76.58	69.41	62.20	57.45	55.05	52.61	52.41	52.10	51.62	51.34
.3439 - .3593	220.27	134.47	105.73	77.03	69.88	62.74	57.89	55.56	53.21	52.83	52.52	52.41	52.07
.3595 - .3749	215.23	129.38	100.68	71.92	64.76	57.57	52.80	52.66	52.52	52.34	26.28	52.22	52.01
.3751 - .3905	235.10	149.30	120.61	91.89	84.68	77.53	72.54	70.26	67.97	66.75	66.02	65.58	64.97
.3907 - .4218	238.10	152.36	123.58	94.88	87.74	80.53	75.75	73.37	70.99	69.88	69.00	68.57	67.97
.4220 - .4374	233.43	147.61	118.92	90.19	83.06	75.85	71.03	68.67	66.26	65.13	64.37	63.92	63.32
.4376 - .4843	244.78	158.99	130.26	101.57	94.41	87.20	82.51	80.12	77.70	76.48	75.75	75.30	74.67
.4845 - .4999	238.60	152.74	124.06	95.33	88.10	80.98	76.23	74.93	73.62	73.43	73.16	73.01	72.89
.5001 - .5311	251.77	164.71	136.29	105.24	102.33	99.59	96.89	94.17	91.44	88.73	85.98	83.27	80.60
.5313 - .5624	253.65	167.48	140.05	108.62	105.41	102.33	99.27	96.21	93.15	90.10	87.03	83.98	80.91
.5626 - .5937	258.46	171.79	143.54	111.94	108.46	105.04	101.64	106.87	94.85	91.44	88.05	84.64	81.21
.5939 - .6249	266.63	180.41	152.99	121.30	118.05	115.04	112.03	109.01	106.00	102.91	99.92	96.89	93.87
.6251 - .6874	275.11	188.55	162.54	130.69	127.75	124.97	122.20	119.42	116.63	113.89	112.19	108.27	105.55
.6876 - .7187	283.46	196.80	169.07	137.05	134.66	132.44	130.07	127.91	125.75	123.54	121.30	120.61	120.38
.7189 - .7499	293.48	207.75	181.91	149.63	146.14	142.68	139.27	135.87	132.44	129.00	125.55	122.14	118.67
.7501 - .8124	308.96	222.53	195.56	164.38	154.09	150.80	147.48	144.18	140.91	137.60	134.26	130.97	127.68
.8126 - .8437	324.52	239.02	210.73	181.64	173.02	170.06	167.22	164.38	161.49	158.59	155.71	152.88	150.01
.8439 - .8749	341.38	254.89	227.10	196.49	185.04	181.13	177.32	173.50	169.67	165.85	161.99	158.22	154.38
.8751 - .9374	355.01	268.16	240.70	208.64	197.00	193.08	189.25	185.37	181.51	177.65	173.76	172.07	170.28
.9376 - .9687	373.21	284.54	257.41	226.17	221.45	217.25	212.78	208.38	203.92	199.45	195.03	192.80	190.72
.9689 - .9999	386.19	299.78	273.19	242.63	236.56	230.60	224.67	218.78	212.90	207.03	201.12	195.19	189.29
1.0001 - 1.0624	415.54	329.03	300.94	269.71	263.09	516.46	249.77	243.16	236.53	229.87	223.23	216.54	209.97
1.0626 - 1.1249	445.17	358.99	331.47	300.96	292.22	283.79	275.30	266.85	258.34	249.93	241.47	233.00	224.55
1.1251 - 1.1874	473.89	386.19	361.15	327.64	320.03	312.57	305.18	297.72	290.29	282.80	275.34	267.94	260.45
1.1876 - 1.2499	503.92	419.05	391.98	359.31	349.65	340.59	331.48	322.46	313.44	304.37	295.33	286.24	277.25
1.2501 - 1.3749	534.19	446.16	417.08	387.45	381.56	319.51	369.80	363.94	358.07	352.20	346.33	345.94	345.15
1.3751 - 1.4999	563.82	477.12	450.08	418.71	414.57	410.70	406.79	404.32	401.84	401.00	400.30	399.33	398.53

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004

COBALT REAMERS

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS



# Chucking Reamers

## STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

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	28.31	190188	30.96
#60	.0400	1/2	4	2-1/2	.0390	188263	28.31	190199	30.96
#59	.0410	1/2	4	2-1/2	.0390	188274	28.31	190210	30.96
#58	.0420	1/2	4	2-1/2	.0390	188285	28.31	190221	30.96
#57	.0430	1/2	4	2-1/2	.0390	188296	28.31	190232	30.96
#56	.0465	1/2	4	2-1/2	.0455	188307	28.31	190243	30.96
3/64	.0469	1/2	4	2-1/2	.0455	188318	28.31	190254	30.96
#55	.0520	1/2	4	2-1/2	.0510	188329	28.31	190265	30.96
#54	.0550	1/2	4	2-1/2	.0510	188340	28.31	190276	30.96
1.5mm	.0591	1/2	4	2-1/2	.0510	188351	28.31	190287	30.96
#53	.0595	1/2	4	2-1/2	.0585	188362	28.31	190298	30.96
1/16	.0625	1/2	4	2-1/2	.0585	188373	28.31	190309	30.96
#52	.0635	1/2	4	2-1/2	.0585	188384	28.31	190320	30.96
#51	.0670	3/4	4	3	.0660	188395	22.78	190331	24.94
#50	.0700	3/4	4	3	.0660	188406	22.78	190342	24.94
#49	.0730	3/4	4	3	.0660	188417	22.78	190353	24.94
#48	.0760	3/4	4	3	.0720	188428	22.78	190364	24.94
5/64	.0781	3/4	4	3	.0720	188439	22.78	190375	24.94
#47	.0785	3/4	4	3	.0720	188450	22.78	190386	24.94
2.0mm	.0787	3/4	4	3	.0720	188461	22.78	190397	24.94
#46	.0810	3/4	4	3	.0771	188472	22.78	190408	24.94
#45	.0820	3/4	4	3	.0771	188483	22.78	190419	24.94
#44	.0860	3/4	4	3	.0810	188494	22.78	190430	24.94
#43	.0890	3/4	4	3	.0810	188505	22.78	190441	24.94
#42	.0935	3/4	4	3	.0880	188516	22.78	190452	24.94
3/32	.0938	3/4	4	3	.0880	188527	22.58	190463	24.94
#41	.0960	7/8	4	3-1/2	.0928	188538	22.94	190474	25.17
#40	.0980	7/8	4	3-1/2	.0928	188549	22.94	190485	25.17
2.5mm	.0984	7/8	4	3-1/2	.0928	188560	22.94	190496	25.17
#39	.0995	7/8	4	3-1/2	.0928	188571	22.94	190507	25.17
#38	.1015	7/8	4	3-1/2	.0950	188582	22.94	190518	25.17
#37	.1040	7/8	4	3-1/2	.0950	188593	22.94	190529	25.17
#36	.1065	7/8	4	3-1/2	.1030	188604	22.94	190540	25.17
7/64	.1094	7/8	4	3-1/2	.1030	188615	23.63	190551	25.95
#35	.1100	7/8	4	3-1/2	.1030	188626	23.63	190562	25.95
#34	.1110	7/8	4	3-1/2	.1055	188637	23.63	190573	25.95
#33	.1130	7/8	4	3-1/2	.1055	188648	23.63	190584	25.95
#32	.1160	7/8	4	3-1/2	.1120	188659	23.63	190595	25.95
3.0mm	.1181	7/8	4	3-1/2	.1120	188670	23.63	190606	25.95
#31	.1200	7/8	4	3-1/2	.1120	188681	23.63	190617	25.95
o/u	.1240	7/8	4	3-1/2	.1190	188692	23.63	190628	25.95
1/8	.1250	7/8	4	3-1/2	.1190	188703	21.31	190639	23.33
o/u	.1260	7/8	4	3-1/2	.1190	188714	23.63	190650	25.95
#30	.1285	7/8	4	3-1/2	.1190	188725	23.63	190661	25.95
#29	.1360	1	4	4	.1275	188736	28.31	190672	30.99
3.5mm	.1378	1	4	4	.1350	188747	28.31	190683	30.99

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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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
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 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

# Chucking Reamers



## STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

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	28.31	190694	30.99
9/64	.1406	1	4	4	.1350	188769	28.31	190705	30.99
#27	.1440	1	4	4	.1350	188780	28.31	190716	30.99
#26	.1470	1	4	4	.1430	188791	28.31	190727	30.99
#25	.1495	1	4	4	.1430	188802	28.31	190738	30.99
#24	.1520	1	4	4	.1460	188813	29.45	190749	30.99
#23	.1540	1	4	4	.1460	188824	29.45	190760	30.99
5/32	.1562	1	4	4	.1510	188835	29.45	190771	30.99
#22	.1570	1	6	4	.1510	188846	29.45	190782	30.99
4.0mm	.1575	1	6	4	.1510	188857	29.45	190793	30.99
#21	.1590	1-1/8	6	4-1/2	.1530	188868	30.21	190804	33.09
#20	.1610	1-1/8	6	4-1/2	.1530	188879	30.21	190815	33.09
#19	.1660	1-1/8	6	4-1/2	.1595	188890	30.21	190826	33.09
#18	.1695	1-1/8	6	4-1/2	.1595	188901	30.21	190837	33.09
11/64	.1719	1-1/8	6	4-1/2	.1645	188912	30.21	190848	33.09
#17	.1730	1-1/8	6	4-1/2	.1645	188923	30.21	190859	33.09
#16	.1770	1-1/8	6	4-1/2	.1704	188934	30.21	190870	33.09
4.5mm	.1772	1-1/8	6	4-1/2	.1704	188945	30.21	190881	33.09
#15	.1800	1-1/8	6	4-1/2	.1755	188956	30.21	190892	33.09
#14	.1820	1-1/8	6	4-1/2	.1755	188967	30.21	190903	33.09
#13	.1850	1-1/8	6	4-1/2	.1805	188978	30.21	190914	33.09
o/u	.1865	1-1/8	6	4-1/2	.1805	188989	30.21	190925	33.09
3/16	.1875	1-1/8	6	4-1/2	.1805	189000	28.70	190936	31.42
o/u	.1885	1-1/8	6	4-1/2	.1805	189011	30.21	190947	33.09
#12	.1890	1-1/8	6	4-1/2	.1805	189022	30.21	190958	33.09
#11	.1910	1-1/4	6	5	.1860	189033	33.84	190969	37.08
#10	.1935	1-1/4	6	5	.1860	189044	33.84	190980	37.08
#9	.1960	1-1/4	6	5	.1895	189055	33.84	190991	37.08
5.0mm	.1969	1-1/4	6	5	.1895	189066	33.84	191002	37.08
#8	.1990	1-1/4	6	5	.1895	189077	33.84	191013	37.08
#7	.2010	1-1/4	6	5	.1895	189088	33.84	191024	37.08
13/64	.2031	1-1/4	6	5	.1945	189099	33.84	191035	37.08
#6	.2040	1-1/4	6	5	.1945	189110	33.84	191046	37.08
#5	.2055	1-1/4	6	5	.2016	189121	33.84	191057	37.08
#4	.2090	1-1/4	6	5	.2016	189132	33.84	191068	37.08
#3	.2130	1-1/4	6	5	.2075	189143	33.84	191079	37.08
5.5mm	.2165	1-1/4	6	5	.2075	189154	33.84	191090	37.08
7/32	.2188	1-1/4	6	5	.2075	189165	33.84	191101	37.08
#2	.2210	1-1/2	6	6	.2173	189176	34.79	191112	38.13
#1	.2280	1-1/2	6	6	.2173	189187	34.79	191123	38.13
A	.2340	1-1/2	6	6	.2265	189198	34.79	191134	38.13
15/64	.2344	1-1/2	6	6	.2265	189209	34.79	191145	38.13
6.0mm	.2362	1-1/2	6	6	.2265	189220	35.02	191156	40.12
B	.2380	1-1/2	6	6	.2329	189231	35.02	191167	40.12
C	.2420	1-1/2	6	6	.2329	189242	35.02	191178	40.12
D	.2460	1-1/2	6	6	.2329	189253	35.02	191189	36.49

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THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.002, -.0000	+0.003, -.0000	+0.001, +.0004	+0.002, +.0006



# Chucking Reamers

## STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
<b>o/u</b>	.2490	1-1/2	6	6	.2405	<b>189264</b>	37.37	<b>191200</b>	42.97
<b>1/4</b>	.2500	1-1/2	6	6	.2405	<b>189275</b>	29.81	<b>191211</b>	34.10
<b>o/u</b>	.2510	1-1/2	6	6	.2405	<b>189286</b>	37.37	<b>191222</b>	42.97
<b>6.5mm</b>	.2559	1-1/2	6	6	.2405	<b>189297</b>	35.02	<b>191233</b>	40.12
<b>F</b>	.2570	1-1/2	6	6	.2485	<b>189308</b>	35.02	<b>191244</b>	40.12
<b>G</b>	.2610	1-1/2	6	6	.2485	<b>189319</b>	35.02	<b>191255</b>	40.12
<b>17/64</b>	.2656	1-1/2	6	6	.2485	<b>189330</b>	39.08	<b>191266</b>	49.55
<b>H</b>	.2660	1-1/2	6	6	.2485	<b>189341</b>	39.08	<b>191277</b>	49.55
<b>I</b>	.2720	1-1/2	6	6	.2485	<b>189352</b>	39.08	<b>191288</b>	49.55
<b>7.0mm</b>	.2756	1-1/2	6	6	.2485	<b>189363</b>	39.08	<b>191299</b>	49.55
<b>J</b>	.2770	1-1/2	6	6	.2485	<b>189374</b>	39.08	<b>191310</b>	49.55
<b>K</b>	.2810	1-1/2	6	6	.2485	<b>189385</b>	39.08	<b>191321</b>	49.55
<b>9/32</b>	.2812	1-1/2	6	6	.2485	<b>189396</b>	37.08	<b>191332</b>	47.09
<b>L</b>	.2900	1-1/2	6	6	.2792	<b>189407</b>	39.08	<b>191343</b>	49.55
<b>M</b>	.2950	1-1/2	6	6	.2792	<b>189418</b>	39.08	<b>191354</b>	49.55
<b>7.5mm</b>	.2953	1-1/2	6	6	.2792	<b>189429</b>	39.08	<b>191365</b>	49.55
<b>19/64</b>	.2969	1-1/2	6	6	.2792	<b>189440</b>	39.08	<b>191376</b>	49.55
<b>N</b>	.3020	1-1/2	6	6	.2792	<b>189451</b>	39.08	<b>191387</b>	49.55
<b>o/u</b>	.3115	1-1/2	6	6	.2792	<b>189462</b>	37.08	<b>191398</b>	47.09
<b>5/16</b>	.3125	1-1/2	6	6	.2792	<b>189473</b>	35.15	<b>191409</b>	44.61
<b>o/u</b>	.3135	1-1/2	6	6	.2792	<b>189484</b>	37.08	<b>191420</b>	47.09
<b>8.0mm</b>	.3150	1-1/2	6	6	.2792	<b>189495</b>	39.08	<b>191431</b>	49.55
<b>O</b>	.3160	1-1/2	6	6	.2792	<b>189506</b>	39.08	<b>191442</b>	49.55
<b>P</b>	.3230	1-1/2	6	6	.2792	<b>189517</b>	41.79	<b>191453</b>	53.38
<b>21/64</b>	.3281	1-1/2	6	6	.2792	<b>189528</b>	41.79	<b>191464</b>	53.38
<b>Q</b>	.3320	1-1/2	6	6	.2792	<b>189539</b>	41.79	<b>191475</b>	53.38
<b>8.5mm</b>	.3346	1-1/2	6	6	.2792	<b>189550</b>	41.79	<b>191486</b>	53.38
<b>R</b>	.3390	1-1/2	6	6	.2792	<b>189561</b>	41.79	<b>191497</b>	53.38
<b>11/32</b>	.3438	1-1/2	6	6	.2792	<b>189572</b>	41.79	<b>191508</b>	53.38
<b>S</b>	.3480	1-3/4	6	6	.3105	<b>189583</b>	42.15	<b>191519</b>	54.10
<b>9.0mm</b>	.3543	1-3/4	6	7	.3105	<b>189594</b>	42.15	<b>191530</b>	54.10
<b>T</b>	.3580	1-3/4	6	7	.3105	<b>189605</b>	42.15	<b>191541</b>	54.10
<b>23/64</b>	.3594	1-3/4	6	7	.3105	<b>189616</b>	42.15	<b>191552</b>	54.10
<b>U</b>	.3680	1-3/4	6	7	.3105	<b>189627</b>	42.15	<b>191563</b>	54.10
<b>9.5mm-o/u</b>	.3740	1-3/4	6	7	.3105	<b>189638</b>	40.06	<b>191574</b>	51.35
<b>3/8</b>	.3750	1-3/4	6	7	.3105	<b>189649</b>	37.96	<b>191585</b>	48.70
<b>o/u</b>	.3760	1-3/4	6	7	.3105	<b>189660</b>	40.06	<b>191596</b>	51.35
<b>V</b>	.3770	1-3/4	6	7	.3105	<b>189671</b>	45.88	<b>191607</b>	68.14
<b>W</b>	.3860	1-3/4	6	7	.3105	<b>189682</b>	45.88	<b>191618</b>	68.14
<b>25/64</b>	.3906	1-3/4	6	7	.3105	<b>189693</b>	45.88	<b>191629</b>	68.14
<b>10.0mm</b>	.3937	1-3/4	6	7	.3105	<b>189704</b>	45.88	<b>191640</b>	68.14
<b>X</b>	.3970	1-3/4	6	7	.3105	<b>189715</b>	45.88	<b>191651</b>	68.14
<b>Y</b>	.4040	1-3/4	6	7	.3105	<b>189726</b>	47.59	<b>191662</b>	68.14
<b>13/32</b>	.4062	1-3/4	6	7	.3105	<b>189737</b>	47.59	<b>191673</b>	68.14
<b>Z</b>	.4130	1-3/4	6	7	.3730	<b>189748</b>	47.59	<b>191684</b>	68.14
<b>10.5mm</b>	.4134	1-3/4	6	7	.3730	<b>189759</b>	47.59	<b>191695</b>	68.14

CONTINUED ON NEXT PAGE

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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
**HSS & COBALT REAMERS**  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS

# Chucking Reamers



## STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

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	47.59	191706	68.14
11.0mm	.4331	1-3/4	6	7	.3730	189781	47.59	191717	68.14
o/u	.4365	1-3/4	6	7	.3730	189792	47.59	191728	68.14
7/16	.4375	1-3/4	6	7	.3730	189803	45.20	191739	64.70
o/u	.4385	1-3/4	6	7	.3730	189814	47.59	191750	68.14
11.5mm	.4528	1-3/4	6	7	.3730	189825	51.87	191761	78.09
29/64	.4531	1-3/4	6	7	.3730	189836	51.87	191772	78.09
15/32	.4688	1-3/4	6	7	.3730	189847	51.87	191783	78.09
12.0mm	.4724	2	6	8	.4355	189858	51.87	191794	78.09
31/64	.4844	2	6	8	.4355	189869	51.87	191805	78.09
12.5mm	.4921	2	6	8	.4355	189880	51.87	191816	78.09
o/u	.4990	2	6	8	.4355	189891	51.87	191827	78.09
1/2	.5000	2	6	8	.4355	189902	49.19	191838	74.16
o/u	.5010	2	6	8	.4355	189913	51.87	191849	78.09
17/32	.5312	2	6	8	.4355	189924	61.17	191860	87.61
9/16	.5625	2	8	8	.4355	189935	61.17	191871	87.61
19/32	.5938	2	8	8	.4355	189946	61.17	191882	87.61
5/8	.6250	2-1/4	8	9	.5615	189957	71.38	191893	102.21
21/32	.6562	2-1/4	8	9	.5615	189968	75.08	191904	115.56
11/16	.6875	2-1/4	8	9	.5615	189979	80.71	191915	115.56
23/32	.7188	2-1/4	8	9	.5615	189990	90.10	191926	128.95
3/4	.7500	2-1/2	8	9-1/2	.6240	190001	90.10	191937	129.67
25/32	.7812	2-1/2	8	9-1/2	.6240	190012	97.66	191948	139.91
13/16	.8125	2-1/2	8	9-1/2	.6240	190023	97.66	191959	139.91
27/32	.8438	2-1/2	8	9-1/2	.6240	190034	115.59	191970	165.53
7/8	.8750	2-5/8	8	10	.7490	190045	118.24	191981	169.36
29/32	.9062	2-5/8	8	10	.7490	190056	127.47	191992	182.49
15/16	.9375	2-5/8	8	10	.7490	190067	127.47	192003	182.49
31/32	.9688	2-5/8	8	10	.7490	190078	142.72	192014	204.38
1	1.0000	2-3/4	8	10-1/2	.8740	190089	144.10	192025	206.02
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	190100	159.74	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	190111	169.76	-	-
1-3/16	1.1875	2-7/8	8	11	.9990	190122	198.79	-	-
1-1/4	1.2500	3	8	11-1/2	.9990	190133	210.70	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	190144	245.78	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	190155	258.32	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	190166	276.97	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	190177	298.18	-	-
1-9/16	1.5625	3-1/2	12	13	1.2490	192036	422.31	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192047	422.31	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192058	484.92	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192069	484.92	-	-
1-13/16	1.8125	4	12	14	1.4990	192080	558.49	-	-
1-7/8	1.8750	4	12	14	1.4990	192091	558.49	-	-
1-15/16	1.9375	4	12	14	1.4990	192102	653.83	-	-
2	2.0000	4	12	14	1.4990	192113	653.83	-	-

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.002, -0.000	+0.003, -0.000	+0.001, +0.004	+0.002, +0.006



# Chucking Reamers

## STRAIGHT SHANK - SPIRAL FLUTE - RIGHT HAND CUT

RIGHT HAND SPIRAL  
HIGH SPEED STEEL



LEFT HAND SPIRAL  
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+
.0391 - .0624	151.37	100.74	81.55	51.91	46.74	40.50	35.73	33.12	30.57	28.67	28.51	28.41	28.31
.0626 - .1093	159.38	101.96	78.66	49.04	43.90	37.50	32.24	29.52	27.13	25.61	25.02	24.61	23.79
.1095 - .1249	156.13	99.85	73.88	42.85	37.63	34.40	28.18	25.61	25.34	24.91	24.43	24.03	23.84
.1251 - .1405	167.50	109.41	83.52	53.75	48.71	42.69	37.39	34.82	32.24	30.99	30.39	29.68	28.99
.1407 - .1561	164.93	107.45	81.66	51.91	46.74	40.88	35.73	33.12	31.25	30.57	29.88	29.13	28.41
.1563 - .1718	167.50	104.51	81.84	53.75	48.71	42.69	37.39	34.82	32.24	31.75	31.25	30.99	30.39
.1720 - .1874	160.61	100.27	81.17	50.11	45.01	40.23	35.42	32.68	32.33	31.84	31.44	30.63	30.23
.1876 - .2030	172.00	114.56	89.96	60.19	55.07	48.85	43.78	41.16	36.85	36.47	35.57	35.42	35.10
.2032 - .2187	172.00	114.56	88.98	59.29	54.13	48.01	42.69	40.23	37.63	35.42	34.98	34.55	34.37
.2189 - .2343	172.68	115.48	89.66	59.97	54.91	48.71	43.48	40.94	38.38	36.82	36.24	35.94	35.73
.2345 - .2499	172.68	115.48	85.34	55.61	50.54	44.54	40.08	36.88	36.53	36.40	35.74	35.23	35.03
.2501 - .2968	171.56	116.63	91.89	63.51	58.60	52.34	47.45	45.01	42.37	41.16	40.14	39.85	39.14
.2970 - .3124	166.81	111.87	87.16	58.66	53.72	47.82	42.75	40.34	40.10	39.88	39.32	39.19	39.12
.3126 - .3437	174.24	119.43	94.56	66.09	61.22	54.72	50.02	47.45	45.01	42.81	42.37	42.08	41.80
.3439 - .3593	174.93	120.10	95.21	66.79	61.89	55.61	50.67	48.14	45.68	43.51	43.05	42.69	42.37
.3595 - .3749	169.93	114.88	90.12	61.54	56.72	50.67	45.81	43.13	42.91	42.75	42.52	42.35	42.17
.3751 - .3905	177.90	122.99	98.42	69.75	64.89	59.40	54.38	51.96	49.52	46.92	46.62	46.23	45.90
.3907 - .4218	180.10	125.19	100.42	71.92	67.05	60.54	55.67	53.21	50.79	48.52	48.05	47.82	47.69
.4220 - .4374	176.72	121.88	96.98	68.67	63.80	57.38	52.34	49.92	49.41	48.78	48.42	47.88	47.61
.4376 - .4843	184.85	129.96	105.15	76.77	71.87	65.13	57.80	56.63	55.41	53.65	53.21	52.66	52.22
.4845 - .4999	180.52	125.64	100.82	72.31	67.53	60.86	53.44	53.08	52.83	52.39	52.22	51.99	51.83
.5001 - .5311	261.98	162.75	129.67	96.47	88.38	80.03	74.53	71.66	68.92	67.56	66.73	66.19	65.52
.5313 - .5624	260.54	161.22	128.11	94.95	86.78	78.40	73.00	70.14	67.37	66.02	65.16	64.55	63.92
.5626 - .5937	270.78	171.43	138.33	105.15	96.98	88.73	83.19	80.53	77.57	76.35	75.46	74.88	74.18
.5939 - .6249	271.12	181.56	138.68	105.47	97.33	89.05	83.56	80.88	77.95	76.65	75.81	75.25	74.47
.6251 - .6874	280.82	181.56	148.38	115.26	107.00	102.66	93.16	90.45	87.73	86.27	85.44	84.96	84.23
.6876 - .7187	289.86	190.68	157.59	123.98	115.89	107.79	102.37	99.64	96.92	95.51	94.60	93.93	93.39
.7189 - .7499	293.54	194.29	161.28	128.10	120.00	111.61	106.03	103.32	100.50	99.18	98.26	97.87	96.80
.7501 - .8124	305.20	205.86	172.98	139.68	131.47	123.19	117.64	114.88	112.15	110.82	109.97	109.39	108.69
.8126 - .8437	316.85	217.50	184.53	151.37	143.09	134.90	129.28	126.56	123.83	122.42	121.53	121.08	120.29
.8439 - .8749	319.78	220.52	187.31	154.14	145.90	137.70	132.08	129.22	126.72	125.19	124.33	123.82	123.23
.8751 - .9374	331.79	232.52	199.33	166.26	158.03	149.85	143.94	141.52	138.75	137.38	136.52	136.33	135.22
.9376 - .9687	345.64	249.35	213.25	180.10	171.81	163.62	158.03	155.30	152.52	151.27	150.22	149.95	149.09
.9689 - .9999	348.50	249.18	216.06	182.90	174.74	166.46	160.94	158.24	155.40	154.08	153.09	152.52	151.94
1.0001 - 1.0624	373.94	279.32	269.41	259.52	249.57	239.66	229.75	219.89	209.91	199.96	190.04	180.10	170.21
1.0626 - 1.1249	394.88	300.75	289.86	279.00	268.15	257.28	246.41	235.52	224.63	213.74	196.10	192.03	181.12
1.1251 - 1.1874	421.74	329.01	317.68	306.86	296.03	285.21	274.48	263.64	252.83	242.01	231.21	220.47	209.63
1.1876 - 1.2499	445.17	351.06	339.28	327.61	315.92	304.25	292.51	280.82	269.15	257.44	251.39	234.08	222.38
1.2501 - 1.3749	506.37	407.81	395.09	382.67	370.18	340.95	345.35	332.95	320.45	308.02	295.60	283.15	263.91
1.3751 - 1.4999	560.13	464.78	450.93	437.07	423.17	409.32	395.42	381.62	367.69	353.82	339.95	326.12	312.22

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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
**HSS REAMERS**  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS

# Chucking Reamers



**STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT**



**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+
.0391 - .0624	195.35	118.03	89.36	60.63	53.47	46.32	41.51	39.12	36.75	35.51	34.81	34.37	33.70
.0626 - .1093	197.57	111.77	83.12	54.32	47.15	39.97	35.20	32.78	30.39	29.18	28.51	28.00	25.72
.1095 - .1249	196.39	110.56	81.87	53.11	45.94	38.80	33.99	31.62	29.18	28.00	27.32	26.82	26.18
.1251 - .1405	197.82	111.69	82.82	55.58	47.61	40.94	39.41	34.79	33.93	32.97	32.21	31.54	30.99
.1407 - .1561	202.48	115.37	84.16	57.96	51.32	44.80	40.49	37.39	35.03	33.69	33.32	32.14	31.00
.1563 - .1718	203.92	118.02	85.77	60.63	53.47	46.32	41.51	39.12	36.75	35.51	34.81	34.28	33.70
.1720 - .1874	204.87	119.04	90.30	61.56	54.46	47.25	42.50	40.08	37.65	36.50	35.80	35.24	34.66
.1876 - .2030	206.69	120.44	92.18	63.35	55.80	49.19	44.02	41.48	39.56	38.06	37.62	37.23	37.08
.2032 - .2187	208.06	122.33	93.61	64.92	57.84	50.31	46.30	42.95	41.76	39.56	38.80	38.90	38.35
.2189 - .2343	209.91	124.06	95.33	66.63	59.42	52.23	47.45	45.08	42.69	41.51	40.75	40.29	39.70
.2345 - .2499	207.56	121.89	93.25	64.49	57.32	50.14	45.39	42.95	40.55	40.49	40.34	40.29	40.10
.2501 - .2968	217.88	132.08	103.37	74.67	67.49	60.33	55.56	53.11	50.70	50.35	50.11	49.79	49.55
.2970 - .3124	214.97	129.12	100.45	71.67	64.53	57.38	52.58	50.16	50.03	49.95	49.83	49.60	49.57
.3126 - .3437	221.23	132.83	105.27	76.11	67.37	61.85	55.96	55.63	55.25	54.62	54.19	53.66	53.37
.3439 - .3593	223.50	137.63	109.22	80.18	73.01	65.86	61.05	58.66	56.25	55.07	54.38	54.30	54.08
.3595 - .3749	222.72	136.93	108.18	79.49	72.31	65.13	60.38	57.96	55.60	54.38	54.19	54.04	54.08
.3751 - .3905	233.34	147.93	119.01	89.05	81.91	74.71	70.94	69.99	69.13	68.86	68.61	68.35	68.13
.3907 - .4218	241.34	155.56	126.88	98.19	90.96	83.81	79.00	76.59	74.21	73.01	72.31	71.87	71.07
.4220 - .4374	240.39	154.53	125.83	97.12	89.93	82.77	77.96	75.56	73.20	71.96	71.29	70.82	70.14
.4376 - .4843	246.22	160.36	131.65	102.91	95.74	88.56	83.81	81.43	79.00	78.75	78.65	78.31	77.96
.4845 - .4999	242.28	156.51	127.76	99.11	91.89	84.68	79.92	79.65	79.35	79.00	78.55	78.15	78.10
.5001 - .5311	323.75	224.00	188.78	148.28	141.85	135.30	128.84	122.33	115.88	109.39	102.88	96.37	89.91
.5313 - .5624	322.27	222.73	189.12	148.63	142.10	135.30	129.15	122.68	116.17	109.71	103.18	96.73	90.25
.5626 - .5937	332.57	233.19	198.63	152.93	146.01	139.01	132.08	125.13	118.21	111.24	104.28	97.33	90.38
.5939 - .6249	332.95	233.54	199.00	160.65	154.35	148.02	141.66	135.30	129.00	122.65	116.33	109.97	103.67
.6251 - .6874	341.10	241.92	211.61	168.72	162.86	156.99	151.13	145.26	139.39	133.52	127.68	121.79	115.92
.6876 - .7187	351.72	252.44	221.17	181.51	175.63	169.76	163.90	158.03	152.17	146.30	140.44	134.57	128.68
.7189 - .7499	355.62	258.52	227.73	182.23	176.36	170.50	164.60	158.74	152.88	147.03	141.13	135.25	129.41
.7501 - .8124	366.71	267.81	235.60	193.46	187.46	180.99	175.41	169.38	163.36	157.28	151.34	145.26	139.26
.8126 - .8437	378.46	278.35	246.42	219.31	213.00	206.86	200.72	194.55	188.42	182.24	176.14	169.96	163.81
.8439 - .8749	381.62	282.40	248.51	222.19	216.04	209.98	203.88	197.77	191.71	185.61	179.53	173.40	167.35
.8751 - .9374	393.61	294.37	261.94	234.43	228.25	222.21	216.22	210.13	204.07	198.01	191.95	185.90	179.85
.9376 - .9687	407.23	307.02	274.21	245.32	240.26	235.16	230.10	225.02	219.98	214.94	209.81	204.87	199.68
.9689 - .9999	410.60	311.05	277.68	248.16	242.91	237.74	232.60	227.45	222.27	217.11	211.98	206.81	201.65

THRU 1/2" DIAMETER	ABOVE 1/2" TO 5/8"	ABOVE 5/8" TO 1-1/2"
+ .0002, - .0000	+ .0003, - .0000	+ .0001, + .0004



# Chucking Reamers

**STRAIGHT SHANK - LEFT HAND SPIRAL - RIGHT HAND CUT**



**HIGH SPEED STEEL**

**HSS REAMERS**  
 CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE BURS  
 CARBIDE REAMERS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
<b>1.0mm</b>	.0394	1/2	4	2-1/2	.0394	<b>192520</b>	28.31
<b>#60</b>	.0400	1/2	4	2-1/2	.0390	<b>192531</b>	28.31
<b>#59</b>	.0410	1/2	4	2-1/2	.0390	<b>192542</b>	28.31
<b>#58</b>	.0420	1/2	4	2-1/2	.0390	<b>192553</b>	28.31
<b>#57</b>	.0430	1/2	4	2-1/2	.0390	<b>192564</b>	28.31
<b>#56</b>	.0465	1/2	4	2-1/2	.0455	<b>192575</b>	28.31
<b>3/64</b>	.0469	1/2	4	2-1/2	.0455	<b>192586</b>	28.31
<b>#55</b>	.0520	1/2	4	2-1/2	.0510	<b>192597</b>	28.31
<b>#54</b>	.0550	1/2	4	2-1/2	.0510	<b>192608</b>	28.31
<b>1.5mm</b>	.0591	1/2	4	2-1/2	.0510	<b>192619</b>	28.31
<b>#53</b>	.0595	1/2	4	2-1/2	.0585	<b>192630</b>	28.31
<b>1/16</b>	.0625	1/2	4	2-1/2	.0585	<b>192641</b>	28.31
<b>#52</b>	.0635	1/2	4	2-1/2	.0585	<b>192652</b>	28.31
<b>#51</b>	.0670	3/4	4	3	.0660	<b>192663</b>	22.78
<b>#50</b>	.0700	3/4	4	3	.0660	<b>192674</b>	22.78
<b>#49</b>	.0730	3/4	4	3	.0660	<b>192685</b>	22.78
<b>#48</b>	.0760	3/4	4	3	.0720	<b>192696</b>	22.78
<b>5/64</b>	.0781	3/4	4	3	.0720	<b>192707</b>	22.78
<b>#47</b>	.0785	3/4	4	3	.0720	<b>192718</b>	22.78
<b>2.0mm</b>	.0787	3/4	4	3	.0720	<b>192729</b>	22.78
<b>#46</b>	.0810	3/4	4	3	.0771	<b>192740</b>	22.78
<b>#45</b>	.0820	3/4	4	3	.0771	<b>192751</b>	22.78
<b>#44</b>	.0860	3/4	4	3	.0810	<b>192762</b>	22.78
<b>#43</b>	.0890	3/4	4	3	.0810	<b>192773</b>	22.78
<b>#42</b>	.0935	3/4	4	3	.0880	<b>192784</b>	22.78
<b>3/32</b>	.0938	3/4	4	3	.0880	<b>192795</b>	22.58
<b>#41</b>	.0960	7/8	4	3-1/2	.0928	<b>192806</b>	22.94
<b>#40</b>	.0980	7/8	4	3-1/2	.0928	<b>192817</b>	22.94
<b>2.5mm</b>	.0984	7/8	4	3-1/2	.0928	<b>192828</b>	22.94
<b>#39</b>	.0995	7/8	4	3-1/2	.0928	<b>192839</b>	22.94
<b>#38</b>	.1015	7/8	4	3-1/2	.0950	<b>192850</b>	22.94
<b>#37</b>	.1040	7/8	4	3-1/2	.0950	<b>192861</b>	22.94
<b>#36</b>	.1065	7/8	4	3-1/2	.1030	<b>192872</b>	22.94
<b>7/64</b>	.1094	7/8	4	3-1/2	.1030	<b>192883</b>	23.63
<b>#35</b>	.1100	7/8	4	3-1/2	.1030	<b>192894</b>	23.63
<b>#34</b>	.1110	7/8	4	3-1/2	.1055	<b>192905</b>	23.63
<b>#33</b>	.1130	7/8	4	3-1/2	.1055	<b>192916</b>	23.63
<b>#32</b>	.1160	7/8	4	3-1/2	.1120	<b>192927</b>	23.63
<b>3.0mm</b>	.1181	7/8	4	3-1/2	.1120	<b>192938</b>	23.63
<b>#31</b>	.1200	7/8	4	3-1/2	.1120	<b>192949</b>	23.63
<b>o/u</b>	.1240	7/8	4	3-1/2	.1190	<b>192960</b>	23.63
<b>1/8</b>	.1250	7/8	4	3-1/2	.1190	<b>192971</b>	21.31
<b>o/u</b>	.1260	7/8	4	3-1/2	.1190	<b>192982</b>	23.63
<b>#30</b>	.1285	7/8	4	3-1/2	.1190	<b>192993</b>	23.63
<b>#29</b>	.1360	1	4	4	.1275	<b>193004</b>	28.31
<b>3.5mm</b>	.1378	1	4	4	.1350	<b>193015</b>	28.31
<b>#28</b>	.1405	1	4	4	.1350	<b>193026</b>	28.31
<b>9/64</b>	.1406	1	4	4	.1350	<b>193037</b>	28.31
<b>#27</b>	.1440	1	4	4	.1350	<b>193048</b>	28.31
<b>#26</b>	.1470	1	4	4	.1430	<b>193059</b>	28.31
<b>#25</b>	.1495	1	4	4	.1430	<b>193070</b>	28.31
<b>#24</b>	.1520	1	4	4	.1460	<b>193081</b>	28.31
<b>#23</b>	.1540	1	4	4	.1460	<b>193092</b>	28.31
<b>5/32</b>	.1562	1	4	4	.1510	<b>193103</b>	28.31
<b>#22</b>	.1570	1	6	4	.1510	<b>193114</b>	28.31
<b>4.0mm</b>	.1575	1	6	4	.1510	<b>193125</b>	28.31
<b>#21</b>	.1590	1-1/8	6	4-1/2	.1530	<b>193136</b>	30.21
<b>#20</b>	.1610	1-1/8	6	4-1/2	.1530	<b>193147</b>	30.21
<b>#19</b>	.1660	1-1/8	6	4-1/2	.1595	<b>193158</b>	30.21

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
<b>#18</b>	.1695	1-1/8	6	4-1/2	.1595	<b>193169</b>	30.21
<b>11/64</b>	.1719	1-1/8	6	4-1/2	.1645	<b>193180</b>	30.21
<b>#17</b>	.1730	1-1/8	6	4-1/2	.1645	<b>193191</b>	30.21
<b>#16</b>	.1770	1-1/8	6	4-1/2	.1704	<b>193202</b>	30.21
<b>4.5mm</b>	.1772	1-1/8	6	4-1/2	.1704	<b>193213</b>	30.21
<b>#15</b>	.1800	1-1/8	6	4-1/2	.1755	<b>193224</b>	30.21
<b>#14</b>	.1820	1-1/8	6	4-1/2	.1755	<b>193235</b>	30.21
<b>#13</b>	.1850	1-1/8	6	4-1/2	.1805	<b>193246</b>	30.21
<b>o/u</b>	.1865	1-1/8	6	4-1/2	.1805	<b>193257</b>	30.21
<b>3/16</b>	.1875	1-1/8	6	4-1/2	.1805	<b>193268</b>	28.70
<b>o/u</b>	.1885	1-1/8	6	4-1/2	.1805	<b>193279</b>	30.21
<b>#12</b>	.1890	1-1/8	6	4-1/2	.1805	<b>193290</b>	30.21
<b>#11</b>	.1910	1-1/4	6	5	.1860	<b>193301</b>	33.84
<b>#10</b>	.1935	1-1/4	6	5	.1860	<b>193312</b>	33.84
<b>#9</b>	.1960	1-1/4	6	5	.1895	<b>193323</b>	33.84
<b>5.0mm</b>	.1969	1-1/4	6	5	.1895	<b>193334</b>	33.84
<b>#8</b>	.1990	1-1/4	6	5	.1895	<b>193345</b>	33.84
<b>#7</b>	.2010	1-1/4	6	5	.1895	<b>193356</b>	33.84
<b>13/64</b>	.2031	1-1/4	6	5	.1945	<b>193367</b>	33.84
<b>#6</b>	.2040	1-1/4	6	5	.1945	<b>193378</b>	33.84
<b>#5</b>	.2055	1-1/4	6	5	.2016	<b>193389</b>	33.84
<b>#4</b>	.2090	1-1/4	6	5	.2016	<b>193400</b>	33.84
<b>#3</b>	.2130	1-1/4	6	5	.2075	<b>193411</b>	33.84
<b>5.5mm</b>	.2165	1-1/4	6	5	.2075	<b>193422</b>	33.84
<b>7/32</b>	.2188	1-1/4	6	5	.2075	<b>193433</b>	33.84
<b>#2</b>	.2210	1-1/2	6	6	.2173	<b>193444</b>	34.79
<b>#1</b>	.2280	1-1/2	6	6	.2173	<b>193455</b>	34.79
<b>A</b>	.2340	1-1/2	6	6	.2265	<b>193466</b>	34.79
<b>15/64</b>	.2344	1-1/2	6	6	.2265	<b>193477</b>	34.79
<b>6.0mm</b>	.2362	1-1/2	6	6	.2265	<b>193488</b>	35.02
<b>B</b>	.2380	1-1/2	6	6	.2329	<b>193499</b>	35.02
<b>C</b>	.2420	1-1/2	6	6	.2329	<b>193510</b>	35.02
<b>D</b>	.2460	1-1/2	6	6	.2329	<b>193521</b>	35.02
<b>o/u</b>	.2490	1-1/2	6	6	.2405	<b>193532</b>	37.37
<b>1/4</b>	.2500	1-1/2	6	6	.2405	<b>193543</b>	29.81
<b>o/u</b>	.2510	1-1/2	6	6	.2405	<b>193554</b>	37.37
<b>6.5mm</b>	.2559	1-1/2	6	6	.2405	<b>193565</b>	35.02
<b>F</b>	.2570	1-1/2	6	6	.2485	<b>193576</b>	35.02
<b>G</b>	.2610	1-1/2	6	6	.2485	<b>193587</b>	35.02
<b>17/64</b>	.2656	1-1/2	6	6	.2485	<b>193598</b>	39.08
<b>H</b>	.2660	1-1/2	6	6	.2485	<b>193609</b>	39.08
<b>I</b>	.2720	1-1/2	6	6	.2485	<b>193620</b>	39.08
<b>7.0mm</b>	.2756	1-1/2	6	6	.2485	<b>193631</b>	39.08
<b>J</b>	.2770	1-1/2	6	6	.2485	<b>193642</b>	39.08
<b>K</b>	.2810	1-1/2	6	6	.2485	<b>193653</b>	39.08
<b>9/32</b>	.2812	1-1/2	6	6	.2485	<b>193664</b>	37.11
<b>L</b>	.2900	1-1/2	6	6	.2792	<b>193675</b>	39.08
<b>M</b>	.2950	1-1/2	6	6	.2792	<b>193686</b>	39.08
<b>7.5mm</b>	.2953	1-1/2	6	6	.2792	<b>193697</b>	39.08
<b>19/64</b>	.2969	1-1/2	6	6	.2792	<b>193708</b>	39.08
<b>N</b>	.3020	1-1/2	6	6	.2792	<b>193719</b>	39.08
<b>o/u</b>	.3115	1-1/2	6	6	.2792	<b>193730</b>	37.11
<b>5/16</b>	.3125	1-1/2	6	6	.2792	<b>193741</b>	35.15
<b>o/u</b>	.3135	1-1/2	6	6	.2792	<b>193752</b>	37.11
<b>8.0mm</b>	.3150	1-1/2	6	6	.2792	<b>193763</b>	39.08
<b>O</b>	.3160	1-1/2	6	6	.2792	<b>193774</b>	39.08
<b>P</b>	.3230	1-1/2	6	6	.2792	<b>193785</b>	41.79
<b>21/64</b>	.3281	1-1/2	6	6	.2792	<b>193796</b>	41.79
<b>Q</b>	.3320	1-1/2	6	6	.2792	<b>193807</b>	41.79

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

CONTINUED ON NEXT PAGE



# Chucking Reamers

## STRAIGHT SHANK - LEFT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
8.5mm	.3346	1-1/2	6	6	.2792	193818	41.79
R	.3390	1-1/2	6	6	.2792	193829	41.79
11/32	.3438	1-1/2	6	6	.2792	193840	41.79
S	.3480	1-3/4	6	6	.3105	193851	42.15
9.0mm	.3543	1-3/4	6	7	.3105	193862	42.15
T	.3580	1-3/4	6	7	.3105	193873	42.15
23/64	.3594	1-3/4	6	7	.3105	193884	42.15
U	.3680	1-3/4	6	7	.3105	193895	42.15
9.5mm-o/u	.3740	1-3/4	6	7	.3105	193906	40.06
3/8	.3750	1-3/4	6	7	.3105	193917	37.96
o/u	.3760	1-3/4	6	7	.3105	193928	40.06
V	.3770	1-3/4	6	7	.3105	193939	45.88
W	.3860	1-3/4	6	7	.3105	193950	45.88
25/64	.3906	1-3/4	6	7	.3105	193961	45.88
10.0mm	.3937	1-3/4	6	7	.3105	193972	45.88
X	.3970	1-3/4	6	7	.3105	193983	45.88
Y	.4040	1-3/4	6	7	.3105	193994	47.59
13/32	.4062	1-3/4	6	7	.3105	194005	47.59
Z	.4130	1-3/4	6	7	.3730	194016	47.59
10.5mm	.4134	1-3/4	6	7	.3730	194027	47.59
27/64	.4219	1-3/4	6	7	.3730	194038	47.59
11.0mm	.4331	1-3/4	6	7	.3730	194049	47.59
o/u	.4365	1-3/4	6	7	.3730	194060	47.59
7/16	.4375	1-3/4	6	7	.3730	194071	45.20
o/u	.4385	1-3/4	6	7	.3730	194082	47.59
11.5mm	.4528	1-3/4	6	7	.3730	194093	51.84
29/64	.4531	1-3/4	6	7	.3730	194104	51.84
15/32	.4688	1-3/4	6	7	.3730	194115	51.84
12.0mm	.4724	2	6	8	.4355	194126	51.84

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
31/64	.4844	2	6	8	.4355	194137	51.84
12.5mm	.4921	2	6	8	.4355	194148	51.84
o/u	.4990	2	6	8	.4355	194159	51.84
1/2	.5000	2	6	8	.4355	194170	49.19
o/u	.5010	2	6	8	.4355	194181	51.84
17/32	.5312	2	6	8	.4355	194192	61.17
9/16	.5625	2	8	8	.4355	194203	61.17
19/32	.5938	2	8	8	.4355	194214	61.17
5/8	.6250	2-1/4	8	9	.5615	194225	71.38
21/32	.6562	2-1/4	8	9	.5615	194236	75.04
11/16	.6875	2-1/4	8	9	.5615	194247	80.71
23/32	.7188	2-1/4	8	9	.5615	194258	90.07
3/4	.7500	2-1/2	8	9-1/2	.6240	194269	90.07
25/32	.7812	2-1/2	8	9-1/2	.6240	194280	97.66
13/16	.8125	2-1/2	8	9-1/2	.6240	194291	97.66
27/32	.8438	2-1/2	8	9-1/2	.6240	194302	115.59
7/8	.8750	2-5/8	8	10	.7490	194313	118.24
29/32	.9062	2-5/8	8	10	.7490	194324	127.47
15/16	.9375	2-5/8	8	10	.7490	194335	127.47
31/32	.9688	2-5/8	8	10	.7490	194346	142.72
1	1.0000	2-3/4	8	10-1/2	.8740	194357	144.10
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	194368	159.71
1-1/8	1.1250	2-7/8	8	11	.8740	194379	169.76
1-3/16	1.1875	2-7/8	8	11	.9990	194390	198.79
1-1/4	1.2500	3	8	11-1/2	.9990	194401	210.70
1-5/16	1.3125	3	10	11-1/2	.9990	194412	245.78
1-3/8	1.3750	3-1/4	10	12	.9990	194423	258.28
1-7/16	1.4375	3-1/4	10	12	1.2490	194434	276.97
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	194445	298.18

## DOWEL PIN SIZES

### STRAIGHT SHANK - STRAIGHT FLUTE - HIGH SPEED STEEL & M42 COBALT



### STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT - HIGH SPEED STEEL & M42 COBALT



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS STR SHK STR FLUTE	LIST PRICE	COBALT STR SHK STR FLUTE	LIST PRICE	HSS STR SHK R.H. SPIRAL	LIST PRICE	COBALT STR SHK R.H. SPIRAL	LIST PRICE
.1230	.1230	7/8	4	3-1/2	.1190	185601	20.62	188098	21.34	192212	23.63	192366	24.64
.1247	.1247	7/8	4	3-1/2	.1190	185612	20.62	188109	21.34	192223	23.63	192377	24.64
.1855	.1855	1-1/8	6	4-1/2	.1805	185623	26.31	188120	26.80	192234	30.21	192388	31.68
.1870	.1870	1-1/8	6	4-1/2	.1805	185634	26.31	188131	26.80	192245	30.21	192399	31.68
.2480	.2480	1-1/2	6	6	.2405	185645	28.70	188142	30.08	192256	31.55	192410	34.40
.2495	.2495	1-1/2	6	6	.2405	185656	28.70	188153	30.08	192267	31.55	192421	34.40
.3105	.3105	1-1/2	6	6	.2792	185667	33.71	188164	43.07	192278	37.11	192432	44.67
.3120	.3120	1-1/2	6	6	.2792	185678	33.71	188175	43.07	192289	37.11	192443	44.67
.3730	.3730	1-3/4	6	7	.3105	185689	36.39	188186	47.19	192300	40.06	192454	48.93
.3745	.3745	1-3/4	6	7	.3105	185700	36.39	188197	47.19	192311	40.06	192465	48.93
.4355	.4355	1-3/4	6	7	.3730	185711	41.07	188208	60.55	192322	47.59	192476	64.90
.4370	.4370	1-3/4	6	7	.3730	185722	41.07	188219	60.55	192333	47.59	192487	64.90
.4980	.4980	2	6	8	.4355	185733	44.74	188230	69.45	192344	51.84	192498	74.39
.4995	.4995	2	6	8	.4355	185744	44.74	188241	69.45	192355	51.84	192509	74.39

DIAMETER TOLERANCES FOR DOWEL PIN SIZES

+0.000, -.0002



# Taper Shank Reamers

## STRAIGHT FLUTE



HIGH SPEED STEEL

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
1/4	.2500	1-1/2	6	6	1	197591	48.31
9/32	.2812	1-1/2	6	6	1	197602	50.56
5/16	.3125	1-1/2	6	6	1	197613	49.71
11/32	.3438	1-1/2	6	6	1	197624	53.87
3/8	.3750	1-3/4	6	7	1	197635	55.57
13/32	.4062	1-3/4	6	7	1	197646	56.55
7/16	.4375	1-3/4	6	7	1	197657	56.81
15/32	.4688	1-3/4	6	7	1	197668	61.36
1/2	.5000	2	6	8	1	197679	62.21
17/32	.5312	2	6	8	1	197690	69.25
9/16	.5625	2	8	8	1	197701	73.87
19/32	.5938	2	8	8	1	197712	75.17
5/8	.6250	2-1/4	8	9	2	197723	80.08
21/32	.6562	2-1/4	8	9	2	197734	80.84
11/16	.6875	2-1/4	8	9	2	197745	80.84
23/32	.7188	2-1/4	8	9	2	197756	91.15
3/4	.7500	2-1/2	8	9-1/2	2	197767	91.15
25/32	.7182	2-1/2	8	9-1/2	2	197778	104.17
13/16	.8125	2-1/2	8	9-1/2	2	197789	104.17
27/32	.8438	2-1/2	8	9-1/2	2	197800	116.31
7/8	.8750	2-5/8	8	10	2	197811	117.56

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
29/32	.9062	2-5/8	8	10	2	197822	129.40
15/16	.9375	2-5/8	8	10	3	197833	129.40
31/32	.9688	2-5/8	8	10	3	197844	142.00
1	1.0000	2-3/4	8	10-1/2	3	197855	143.25
1-1/16	1.0625	2-3/4	8	10-1/2	3	197866	156.60
1-1/8	1.1250	2-7/8	8	11	3	197877	173.78
1-3/16	1.1875	2-7/8	10	11	3	197888	194.76
1-1/4	1.2500	3	10	11-1/2	4	197899	210.86
1-5/16	1.3125	3	10	11-1/2	4	197910	230.60
1-3/8	1.3750	3-1/4	10	12	4	197921	249.22
1-7/16	1.4375	3-1/4	10	12	4	197932	270.13
1-1/2	1.5000	3-1/2	10	12-1/2	4	197943	287.12
1-9/16	1.5625	3-1/2	12	13	4	197954	403.13
1-5/8	1.6250	3-1/2	12	13	4	197965	403.13
1-11/16	1.6875	4	12	13-1/2	5	197976	462.89
1-3/4	1.7500	4	12	13-1/2	5	197987	462.89
1-13/16	1.8125	4	12	14	5	197998	533.13
1-7/8	1.8750	4	12	14	5	198009	533.13
1-15/16	1.9375	4	12	14	5	198020	624.14
2	2.0000	4	12	14	5	198031	624.14
-	-	-	-	-	-	-	-

## TAPER SHANK - 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+
.2501 - .2969	218.39	148.42	116.94	80.82	74.53	66.63	60.38	57.25	53.89	51.11	50.95	50.70	50.59
.2970 - .3124	212.30	142.42	110.88	74.67	68.42	60.82	54.39	51.32	50.95	50.67	50.35	50.03	49.74
.3126 - .3437	221.81	151.99	120.36	77.95	75.50	69.75	63.64	60.38	57.25	54.51	54.32	54.13	53.89
.3439 - .3594	222.67	152.88	121.21	85.02	78.79	70.77	63.64	61.22	58.43	55.37	54.71	54.32	53.89
.3595 - .3749	216.28	146.17	114.71	78.40	72.17	64.53	58.29	57.74	57.22	56.74	56.25	55.76	55.58
.3751 - .3906	226.40	156.58	125.23	88.73	82.51	75.57	69.21	66.07	62.96	59.66	59.37	58.85	58.40
.3907 - .4219	229.24	159.35	127.76	91.53	85.31	77.09	70.84	67.72	64.63	61.76	61.18	60.82	60.76
.4220 - .4374	224.93	155.10	123.47	87.41	81.15	73.00	66.63	63.51	60.38	59.42	58.85	58.06	57.54
.4376 - .4844	234.75	165.41	133.83	97.65	91.44	82.87	73.53	72.05	70.52	68.09	67.72	67.07	66.44
.4845 - .4999	229.77	159.85	128.29	92.01	85.89	77.45	68.03	65.73	65.20	64.53	63.99	63.35	62.75
.5001 - .5311	262.93	172.65	139.49	93.87	95.75	88.12	80.12	74.41	71.92	73.77	72.72	70.45	70.31
.5313 - .5624	267.77	177.46	147.39	101.77	100.50	89.81	84.90	79.22	76.65	76.35	75.50	74.44	74.18
.5626 - .5937	277.06	186.74	156.64	117.19	109.77	99.18	94.15	88.72	85.98	81.75	80.95	79.58	77.24
.5939 - .6249	277.35	187.02	156.95	117.52	110.12	99.45	94.47	88.98	86.34	85.89	84.65	84.04	83.43
.6251 - .6874	286.18	195.94	165.79	126.41	118.92	111.91	103.24	97.63	95.17	90.77	90.03	88.72	86.49
.6876 - .7187	294.45	204.21	174.13	134.35	126.99	116.55	111.61	106.03	103.55	99.18	98.36	94.22	92.68
.7189 - .7499	297.74	207.24	177.54	138.04	130.69	120.01	114.91	109.39	106.81	106.52	106.08	105.05	105.04
.7501 - .8124	308.33	218.04	188.13	148.58	141.13	130.55	125.49	119.85	119.43	118.82	118.21	117.68	117.41
.8126 - .8437	318.92	228.62	198.65	159.26	151.72	141.15	136.05	130.50	128.00	123.61	122.84	121.11	120.52
.8439 - .8749	321.63	231.39	201.18	161.77	154.27	143.69	138.60	133.46	130.62	129.82	129.05	127.11	126.70
.8751 - .9374	332.52	242.27	212.12	172.74	165.31	154.79	149.63	144.08	141.56	137.23	136.45	132.85	129.82
.9376 - .9687	345.11	254.84	224.79	185.37	177.89	167.25	162.19	156.64	154.09	149.81	148.93	145.50	142.10
.9689 - .9999	347.64	257.41	227.32	187.89	180.49	169.77	164.89	159.29	156.67	152.40	151.59	149.78	148.28
1.0001 - 1.0624	370.84	284.84	275.84	257.58	248.51	236.40	227.39	215.29	206.28	194.12	185.11	166.96	160.65
1.0626 - 1.1249	389.05	304.29	294.45	275.26	265.36	252.43	245.62	229.54	219.64	206.69	196.78	185.37	179.18
1.1251 - 1.1874	414.31	329.92	319.72	300.62	290.77	277.82	268.07	255.14	245.29	232.38	222.59	210.42	200.93
1.1876 - 1.2499	435.63	350.04	339.32	319.45	308.85	295.09	284.48	270.77	259.56	246.42	207.70	228.65	216.28
1.2501 - 1.3749	491.23	401.62	390.08	369.50	358.20	343.79	332.47	318.11	306.80	292.41	281.07	266.47	250.24
1.3751 - 1.4999	540.10	453.42	440.82	418.93	406.28	390.61	378.06	362.34	349.69	334.03	309.06	298.10	287.29

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

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS

HSS TAPER SHANK REAMERS

# Expansion Reamers



## STRAIGHT SHANK



HIGH SPEED STEEL

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	3/4	6	7	5/16	194456	125.05
13/32	3/4	6	7	5/16	194467	133.20
7/16	7/8	6	7	3/8	194478	133.20
15/32	7/8	6	8	27/64	194489	138.34
1/2	1	6	8	7/16	194500	140.79
17/32	1	6	8	7/16	194511	146.75
9/16	1-1/8	6	8	7/16	194522	150.48
19/32	1-1/8	6	8	7/16	194533	152.77
5/8	1-1/4	6	9	9/16	194544	157.42
21/32	1-1/4	6	9	9/16	194555	163.70
11/16	1-1/4	6	9	9/16	194566	164.85
23/32	1-1/4	6	9	9/16	194577	175.55
3/4	1-3/8	6	9-1/2	5/8	194588	181.60
25/32	1-3/8	8	9-1/2	5/8	194599	192.27
13/16	1-3/8	8	9-1/2	5/8	194610	199.64
27/32	1-3/8	8	9-1/2	5/8	194621	210.34
7/8	1-1/2	8	10	3/4	194632	214.17

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
29/32	1-1/2	8	10	3/4	194643	225.52
15/16	1-1/2	8	10	3/4	194654	236.09
31/32	1-1/2	8	10	3/4	194665	246.76
1	1-5/8	8	10-1/2	7/8	194676	260.28
1-1/32	1-5/8	8	10-1/2	7/8	194687	362.13
1-1/16	1-5/8	8	10-1/2	7/8	194698	287.67
1-3/32	1-5/8	8	10-1/2	7/8	194709	301.35
1-1/8	1-3/4	8	11	7/8	194720	314.80
1-5/32	1-3/4	8	11	7/8	194731	319.09
1-3/16	1-3/4	8	11	1	194742	331.56
1-7/32	1-3/4	8	11	1	194753	343.64
1-1/4	1-7/8	8	11-1/2	1	194764	357.35
1-5/16	1-7/8	8	11-1/2	1	194775	369.29
1-3/8	2	8	12	1	194786	382.88
1-7/16	2	8	12	1-1/4	194797	398.03
1-1/2	2-1/8	8	12-1/2	1-1/4	194808	414.82
-	-	-	-	-	-	-

## TAPER SHANK



HIGH SPEED STEEL

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	MORSE TAPER#	ITEM#	LIST PRICE
3/8	3/4	6	7	5/16	1	194819	141.87
13/32	3/4	6	7	5/16	1	194830	164.52
7/16	7/8	6	7	3/8	1	194841	150.22
15/32	7/8	6	8	27/64	1	194852	153.79
1/2	1	6	8	7/16	1	194863	156.86
17/32	1	6	8	7/16	1	194874	163.08
9/16	1-1/8	6	8	7/16	1	194885	163.08
19/32	1-1/8	6	8	7/16	1	194896	169.04
5/8	1-1/4	6	9	9/16	2	194907	175.09
21/32	1-1/4	6	9	9/16	2	194918	179.90
11/16	1-1/4	6	9	9/16	2	194929	180.98
23/32	1-1/4	6	9	9/16	2	194940	193.06
3/4	1-3/8	6	9-1/2	5/8	2	194951	199.01
25/32	1-3/8	8	9-1/2	5/8	2	194962	208.18
13/16	1-3/8	8	9-1/2	5/8	2	194973	211.29
27/32	1-3/8	8	9-1/2	5/8	2	194984	223.59
7/8	1-1/2	8	10	3/4	2	194995	232.40

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	MORSE TAPER#	ITEM#	LIST PRICE
29/32	1-1/2	8	10	3/4	2	195006	244.47
15/16	1-1/2	8	10	3/4	3	195017	250.56
31/32	1-1/2	8	10	3/4	3	195028	261.13
1	1-5/8	8	10-1/2	7/8	3	195039	276.19
1-1/32	1-5/8	8	10-1/2	7/8	3	195050	286.76
1-1/16	1-5/8	8	10-1/2	7/8	3	195061	300.47
1-3/32	1-5/8	8	10-1/2	7/8	3	195072	313.89
1-1/8	1-3/4	8	11	7/8	3	195083	324.72
1-5/32	1-3/4	8	11	7/8	3	195094	338.11
1-3/16	1-3/4	8	11	1	3	195105	351.62
1-7/32	1-3/4	8	11	1	3	195116	365.17
1-1/4	1-7/8	8	11-1/2	1	4	195127	382.06
1-5/16	1-7/8	8	11-1/2	1	4	195138	397.01
1-3/8	2	8	12	1	4	195149	413.48
1-7/16	2	8	12	1-1/4	4	195160	437.73
1-1/2	2-1/8	8	12-1/2	1-1/4	4	195171	452.68
-	-	-	-	-	-	-	-

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

HSS EXPANSION REAMERS

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS



# Hand Reamers

## 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	58.35
5/64	.0781	1	4	2	.0781	197008	58.35
3/32	.0938	1-1/4	4	2-1/2	.0938	197019	58.35
7/64	.1094	1-1/4	4	2-1/2	.1094	197030	58.35
1/8	.1250	1-1/2	4	3	.1250	197041	55.01
9/64	.1406	1-5/8	4	3-1/4	.1406	197052	55.01
5/32	.1562	1-5/8	4	3-1/4	.1562	197063	59.47
11/64	.1719	1-3/4	6	3-1/2	.1719	197074	59.47
3/16	.1875	1-3/4	6	3-1/2	.1875	197085	58.35
13/64	.2031	1-7/8	6	3-3/4	.2031	197096	58.35
7/32	.2188	1-7/8	6	3-3/4	.2188	197107	64.31
15/64	.2344	2	6	4	.2344	197118	64.31
1/4	.2500	2	6	4	.2500	197129	63.92
17/64	.2656	2-1/8	6	4-1/4	.2656	197140	64.31
9/32	.2812	2-1/8	6	4-1/4	.2812	197151	69.19
19/64	.2969	2-1/4	6	4-1/2	.2969	197162	69.19
5/16	.3125	2-1/4	6	4-1/2	.3125	197173	67.65
11/32	.3438	2-3/8	6	4-3/4	.3438	197184	78.51
3/8	.3750	2-1/2	6	5	.3750	197195	76.65
13/32	.4062	2-5/8	6	5-1/4	.4062	197206	88.95
7/16	.4375	2-3/4	6	5-1/2	.4375	197217	87.15
15/32	.4688	2-7/8	6	5-3/4	.4688	197228	96.41

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/2	.5000	3	6	6	.5000	197239	92.68
17/32	.5312	3-1/8	8	6-1/4	.5312	197250	100.15
9/16	.5625	3-1/4	8	6-1/2	.5625	197261	107.12
19/32	.5938	3-3/8	8	6-3/4	.5938	197272	119.06
5/8	.6250	3-1/2	8	7	.6250	197283	115.43
21/32	.6562	3-11/16	8	7-3/8	.6562	197294	129.37
11/16	.6875	3-7/8	8	7-3/4	.6875	197305	126.82
23/32	.7188	4-1/16	8	8-1/8	.7188	197316	138.93
3/4	.7500	4-3/16	8	8-3/8	.7500	197327	135.23
25/32	.7812	4-3/8	8	8-3/4	.7812	197338	148.39
13/16	.8125	4-9/16	8	9-1/8	.8125	197349	135.23
27/32	.8438	4-11/16	8	9-3/8	.8438	197360	162.46
7/8	.8750	4-7/8	8	9-3/4	.8750	197371	163.87
29/32	.9062	5	8	10	.9062	197382	181.08
15/16	.9375	5-1/8	8	10-1/4	.9375	197393	164.00
31/32	.9688	5-5/16	8	10-5/8	.9688	197404	199.37
1	1.0000	5-7/16	8	10-7/8	1.0000	197415	198.49
1-1/8	1.1250	5-13/16	8	11-5/8	1.1250	197426	259.40
1-1/4	1.2500	6-1/8	8	12-1/4	1.2500	197437	318.53
1-3/8	1.3750	6-5/16	10	12-5/8	1.3750	197448	376.49
1-1/2	1.5000	6-1/2	10	13	1.5000	197459	444.37
-	-	-	-	-	-	-	-

## STRAIGHT SHANK - LEFT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/16	.0625	1	4	2	.0625	195182	68.47
5/64	.0781	1	4	2	.0781	195193	68.47
3/32	.0938	1-1/4	4	2-1/2	.0938	195204	68.47
7/64	.1094	1-1/4	4	2-1/2	.1094	195215	68.47
1/8	.1250	1-1/2	4	3	.1250	195226	67.65
9/64	.1406	1-5/8	4	3-1/4	.1406	195237	67.65
5/32	.1562	1-5/8	4	3-1/4	.1562	195248	72.95
11/64	.1719	1-3/4	6	3-1/2	.1719	195259	72.95
3/16	.1875	1-3/4	6	3-1/2	.1875	195270	72.95
13/64	.2031	1-7/8	6	3-3/4	.2031	195281	72.95
7/32	.2188	1-7/8	6	3-3/4	.2188	195292	71.02
15/64	.2344	2	6	4	.2344	195303	71.02
1/4	.2500	2	6	4	.2500	195314	70.69
17/64	.2656	2-1/8	6	4-1/4	.2656	195325	71.02
9/32	.2812	2-1/8	6	4-1/4	.2812	195336	78.51
19/64	.2969	2-1/4	6	4-1/2	.2969	195347	78.51
5/16	.3125	2-1/4	6	4-1/2	.3125	195358	77.76
11/32	.3438	2-3/8	6	4-3/4	.3438	195369	87.45
3/8	.3750	2-1/2	6	5	.3750	195380	87.19
13/32	.4062	2-5/8	6	5-1/4	.4062	195391	96.87
7/16	.4375	2-3/4	6	5-1/2	.4375	195402	97.20
15/32	.4688	2-7/8	6	5-3/4	.4688	195413	107.31

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/2	.5000	3	6	6	.5000	195424	104.69
17/32	.5312	3-1/8	8	6-1/4	.5312	195435	122.24
9/16	.5625	3-1/4	8	6-1/2	.5625	195446	122.92
19/32	.5938	3-3/8	8	6-3/4	.5938	195457	133.69
5/8	.6250	3-1/2	8	7	.6250	195468	131.24
21/32	.6562	3-11/16	8	7-3/8	.6562	195479	143.90
11/16	.6875	3-7/8	8	7-3/4	.6875	195490	143.48
23/32	.7188	4-1/16	8	8-1/8	.7188	195501	154.70
3/4	.7500	4-3/16	8	8-3/8	.7500	195512	151.72
25/32	.7812	4-3/8	8	8-3/4	.7812	195523	164.88
13/16	.8125	4-9/16	8	9-1/8	.8125	195534	164.88
27/32	.8438	4-11/16	8	9-3/8	.8438	195545	180.46
7/8	.8750	4-7/8	8	9-3/4	.8750	195556	180.46
29/32	.9062	5	8	10	.9062	195567	201.17
15/16	.9375	5-1/8	8-10	10-1/4	.9375	195578	201.17
31/32	.9688	5-5/16	8-10	10-5/8	.9688	195589	221.53
1	1.0000	5-7/16	8-10	10-7/8	1.0000	195600	221.53
1-1/8	1.1250	5-13/16	8-10	11-5/8	1.1250	195611	285.15
1-1/4	1.2500	6-1/8	8-10	12-1/4	1.2500	195622	350.87
1-3/8	1.3750	6-5/16	8-10	12-5/8	1.3750	195633	413.97
1-1/2	1.5000	6-1/2	8-10	13	1.5000	195644	490.32
-	-	-	-	-	-	-	-

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

CARBIDE ENDMILLS  
 CARBIDE MICRO ENDMILLS  
 CARBIDE THREADMILLS  
 CARBIDE DRILL MILLS  
 CARBIDE DRILLS  
 CARBIDE REAMERS  
 CARBIDE BURS  
 COUNTERSINKS  
 TAPS & DIES  
 HSS & COBALT DRILLS  
 HSS & COBALT ENDMILLS  
**HSS HAND REAMERS**

# Reamers



## TAPER PIPE REAMERS - LEFT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	# OF FLUTES	THREAD OR FLUTE LENGTH	OVERALL LENGTH	SHANK DIA.	SIZE OF SQUARE	ITEM#	LIST PRICE
1/16	.2320	.2750	6	3/4	2-1/8	.3125	.235	197470	76.32
1/8	.3160	.3620	6	3/4	2-1/8	.4375	.328	197481	71.15
1/4	.4060	.4720	6	1-1/16	2-7/16	.5625	.421	197492	81.46
3/8	.5400	.6060	6	1-1/16	2-9/16	.7000	.531	197503	92.23
1/2	.6650	.7510	6	1-3/8	3-1/8	.6875	.515	197514	116.51
3/4	.8760	.9620	8	1-3/8	3-1/4	.9063	.679	197525	161.54
1	1.1030	1.2120	8	1-3/4	3-3/4	1.1250	.843	197536	237.70
1-1/4	1.4440	1.5530	10	1-3/4	4	1.3125	.984	197547	400.35
1-1/2	1.6840	1.7930	12	1-3/4	4-1/4	1.5000	1.125	197558	506.23
2	2.1590	2.2680	12	1-3/4	4-1/2	1.8750	1.406	197569	676.18

## TAPER PIN REAMERS

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	.0666	4	196117	61.04	196579	63.33	196348	56.62
6/0	.0611	.0806	4	196128	61.04	196590	63.33	196359	53.31
5/0	.0719	.0966	4	196139	55.64	196601	61.04	196370	55.31
4/0	.0869	.1142	4	196150	55.64	196612	61.04	196381	55.31
3/0	.1029	.1302	4	196161	55.64	196623	61.04	196392	49.94
2/0	.1137	.1462	4	196172	49.75	196634	53.31	196403	50.53
0	.1287	.1638	4	196183	47.85	196645	50.96	196414	51.74
1	.1447	.1798	6	196194	46.34	196656	51.74	196425	52.53
2	.1605	.2008	6	196205	46.34	196667	51.74	196436	59.47
3	.1813	.2294	6	196216	46.34	196678	51.74	196447	61.46
4	.2071	.2604	6	196227	51.74	196689	56.42	196458	69.19
5	.2409	.2994	6	196238	55.64	196700	60.19	196469	75.70
6	.2773	.3540	6	196249	67.16	196711	74.16	196480	88.85
7	.3297	.4220	6	196260	86.50	196722	93.76	196491	109.67
8	.3971	.5050	6	196271	90.49	196733	121.25	196502	128.68
9	.4805	.6066	6	196282	134.41	196744	146.32	196513	141.38
10	.5799	.7216	6	196293	147.57	196755	162.20	196524	179.51
11	.7060	.8780	8	196304	157.25	196766	173.03	196535	190.28
12	.8420	1.0500	8	196315	243.33	196777	267.64	196546	294.55
13	1.0090	1.2590	10	196326	471.96	196788	519.15	196557	570.57
14	1.2500	1.5420	10	196337	756.23	196799	839.26	196568	921.53

HSS - TAPER PIPE & TAPER PIN REAMERS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS



# Reamers

## CAPSCREW COUNTERBORES HIGH SPEED STEEL



STANDARD • 1/64 o/s • 1/32 o/s

SIZE	TOLERANCE	PILOT SIZE	PILOT LENGTH	FLUTE SIZE	BODY LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
4	std.	.1120	1/8	.1830	9/16	3-7/8	195655	35.02
4	1/64 o/s	.1270	1/8	.1990	9/16	3-7/8	195809	35.02
4	1/32 o/s	.1430	1/8	.2150	9/16	3-7/8	195963	35.02
5	std.	.1250	5/32	.2050	5/8	4-1/8	195666	35.02
5	1/64 o/s	.1400	5/32	.2210	5/8	4-1/8	195820	35.02
5	1/32 o/s	.1560	5/32	.2370	5/8	4-1/8	195974	35.02
6	std.	.1380	3/16	.2270	3/4	4-5/8	195677	37.08
6	1/64 o/s	.1530	3/16	.2430	3/4	4-5/8	195831	37.08
6	1/32 o/s	.1690	3/16	.2590	3/4	4-5/8	195985	37.08
8	std.	.1640	7/32	.2700	3/4	5	195688	39.73
8	1/64 o/s	.1790	7/32	.2860	3/4	5	195842	39.73
8	1/32 o/s	.1950	7/32	.3020	3/4	5	195996	39.73
10	std.	.1900	1/4	.3120	7/8	5-1/4	195699	40.58
10	1/64 o/s	.2050	1/4	.3280	7/8	5-1/4	195853	40.58
10	1/32 o/s	.2210	1/4	.3440	7/8	5-1/4	196007	40.58
1/4	std.	.2500	9/32	.3800	1	5-5/8	195710	42.68
1/4	1/64 o/s	.2650	9/32	.3960	1	5-5/8	195864	42.68
1/4	1/32 o/s	.2810	9/32	.4120	1	5-5/8	196018	42.68
5/16	std.	.3125	5/16	.4740	1	6-1/8	195721	53.31
5/16	1/64 o/s	.3280	5/16	.4890	1	6-1/8	195875	53.31
5/16	1/32 o/s	.3430	5/16	.5040	1	6-1/8	196029	53.31
3/8	std.	.3750	3/8	.5690	1-1/4	6-1/2	195732	58.22
3/8	1/64 o/s	.3900	3/8	.5850	1-1/4	6-1/2	195886	58.22
3/8	1/32 o/s	.4060	3/8	.6010	1-1/4	6-1/2	196040	58.22
7/16	std.	.4370	7/16	.6610	1-1/4	7	195743	70.04
7/16	1/64 o/s	.4520	7/16	.6760	1-1/4	7	195897	70.04
7/16	1/32 o/s	.4680	7/16	.6910	1-1/4	7	196051	70.04
1/2	std.	.5000	1/2	.7550	1-1/2	7-1/2	195754	80.15
1/2	1/64 o/s	.5150	1/2	.7710	1-1/2	7-1/2	195908	80.15
1/2	1/32 o/s	.5310	1/2	.7870	1-1/2	7-1/2	196062	80.15
5/8	std.	.6250	5/8	.9690	1-1/2	7-5/8	195765	130.78
5/8	1/64 o/s	.6400	5/8	.9840	1-1/2	7-5/8	195919	130.78
5/8	1/32 o/s	.6560	5/8	1.0000	1-1/2	7-5/8	196073	130.78
3/4	std.	.7500	3/4	1.1560	1-5/8	7-3/4	195776	152.15
3/4	1/64 o/s	.7650	3/4	1.1720	1-5/8	7-3/4	195930	152.15
3/4	1/32 o/s	.7810	3/4	1.1880	1-5/8	7-3/4	196084	152.15
7/8	std.	.8750	7/8	1.3440	1-7/8	8	195787	185.33
7/8	1/64 o/s	.8910	7/8	1.3590	1-7/8	8	195941	185.33
7/8	1/32 o/s	.9060	7/8	1.3750	1-7/8	8	196095	185.33
1	std.	1.0000	1	1.5310	2	8-1/2	195798	235.11
1	1/64 o/s	1.0150	1	1.5470	2	8-1/2	195952	235.11
1	1/32 o/s	1.0310	1	1.5630	2	8-1/2	196106	235.11

CARBIDE ENDMILLS  
CARBIDE MICRO ENDMILLS  
CARBIDE THREADMILLS  
CARBIDE DRILL MILLS  
CARBIDE DRILLS  
CARBIDE REAMERS  
CARBIDE BURS  
COUNTERSINKS  
TAPS & DIES  
HSS & COBALT DRILLS  
HSS & COBALT ENDMILLS

HSS CAPSCREW COUNTERBORES

# Reamers



## CONSTRUCTION REAMERS

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	74.70
7/16	3-1/4	5	5-3/8	7/16	196887	80.61
1/2	3-3/4	5	5-7/8	1/2	196898	89.21
9/16	3-3/4	5	5-7/8	1/2	196909	92.85
5/8	4-1/4	5	6-3/8	1/2	196920	103.27
11/16	4-1/4	5	6-3/8	1/2	196931	112.58
3/4	4-1/2	5	6-7/8	1/2	196942	130.36
13/16	4-1/2	5	6-7/8	1/2	196953	130.36
7/8	4-1/2	5	6-7/8	1/2	196964	147.88
15/16	4-1/2	5	6-7/8	1/2	196975	147.88
1	4-1/2	5	6-7/8	1/2	196986	168.85
1-1/16	4-1/2	5	6-7/8	1/2	197580	198.64



## SAFETY REAMERS WITH MAGNETIC HEX SHANK

HIGH SPEED STEEL  
LEFT HAND SPIRAL  
RIGHT HAND CUT

Magnetic Hex Shank has been designed to protect against danger and loss of falling objects such as reamers.

See OSHA 29CFR Part 1926.759 (falling object protection)

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	HEX SHANK DIAMETER	ITEM#	LIST PRICE
9/16	4	5	5-1/2	1-1/16	198196	144.36
11/16	4-1/2	5	6-3/8	1-1/16	198207	174.58
13/16	5	5	7	1-1/4	198218	208.76
15/16	5	5	7	1-7/16	198229	235.88
1-1/16	5	5	7	1-5/8	198240	312.42
1-3/16	5	5	7	1-13/16	232956	402.45
1-5/16	5	5	7-7/8	2	232967	480.76



## BRIDGE REAMERS

HIGH SPEED STEEL  
LEFT HAND SPIRAL  
RIGHT HAND CUT

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
7/16	5-1/8	5	9	2	198042	73.73
1/2	5-1/8	5	9	2	198053	82.08
9/16	5-1/8	5	9	2	196810	82.08
5/8	6-1/8	5	10	2	198064	88.63
11/16	7-1/8	5	11-3/4	3	196821	94.81
3/4	7-3/8	5	12	3	196832	123.45
13/16	7-3/8	5	12	3	196843	123.45
7/8	7-3/8	5	12	3	198075	135.33
15/16	7-3/8	5	12	3	196854	144.46
1	7-3/8	5	12	3	198086	156.99
1-1/16	7-3/8	5	12	3	196865	162.98
1-1/8	7-3/8	5	12	3	198097	198.88
1-3/16	7-3/8	5	12	3	198108	254.23
1-1/4	7-3/8	5	13	4	198119	289.28
1-5/16	7-3/8	5	13	4	198130	341.80
1-3/8	7-3/8	5	13	4	198141	354.89
1-7/16	7-3/8	6	13	4	198152	368.97
1-1/2	7-3/8	6	13	4	198163	418.91
1-9/16	7-3/8	6	13	4	198174	503.44
1-5/8	7-3/8	6	13	4	198185	580.45

HSS - CONSTRUCTION • SAFETY • BRIDGE REAMERS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

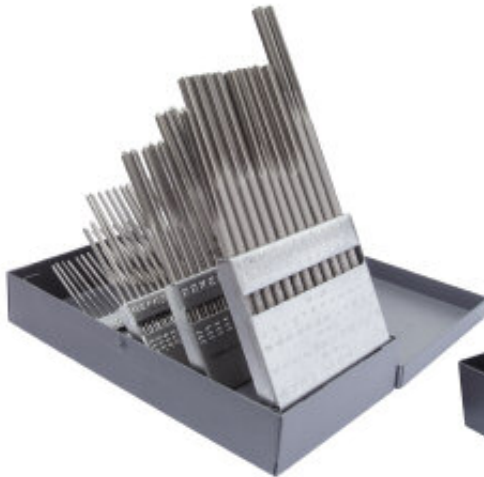


# Reamer Sets

## HSS - CONSTRUCTION REAMER SETS

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
3Pc. • 1/2", 5/8", 3/4" 3 FLATS • Black & Gold	Left Hand	185876	427.32

**ITEM# 185876**  
 3 PC. 1/2", 5/8", 3/4"  
 3 FLATS • BLACK & GOLD  
 HIGH SPEED STEEL



**ITEM# 185799**  
 60 PC. #1 - #60  
 HIGH SPEED STEEL



**ITEM# 185777**  
 29 PC. 1/16" - 1/2" BY 64ths  
 HIGH SPEED STEEL

## HSS & COBALT - REAMER SETS

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
29Pc • 1/16" - 1/2" by 64ths • HSS	Straight	185777	1,018.05
29Pc • 1/16" - 1/2" by 64ths • M42 Cobalt	Straight	185788	1,333.64
60Pc • #1 - #60 • HSS	Straight	185799	1,510.33
60Pc • #1 - #60 • M42 Cobalt	Straight	185810	1,639.80
26Pc • A-Z • HSS	Straight	185821	942.05
26Pc • A-Z • M42 Cobalt	Straight	185832	1,311.35
14Pc • Dowel Pin • .1230 - .4995 • HSS	Straight	185755	528.02
14Pc • Dowel Pin • .1230 - .4995 • M42 Cobalt	Straight	185766	692.61
14Pc • O/U • .1240 - .5010 • HSS	Straight	185843	528.02
14Pc • O/U • .1240 - .5010 • M42 Cobalt	Straight	185854	661.84
60Pc • #61 - #80 • HSS	Straight	185865	618.94
10Pc • #4 - 1/2" • Std • Ctr Bore Set • HSS	RH Spiral	185887	519.02
10Pc • #4 - 1/2" • 1/64" OS • Ctr Bore Set • HSS	RH Spiral	185898	519.02
10Pc • #4 - 1/2" • 1/32" OS • Ctr Bore Set • HSS	RH Spiral	185909	519.02

CARBIDE  
ENDMILLS

CARBIDE  
MICRO ENDMILLS

CARBIDE  
THREADMILLS

CARBIDE  
DRILL MILLS

CARBIDE  
DRILLS

CARBIDE  
REAMERS

CARBIDE  
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT  
DRILLS

HSS & COBALT  
ENDMILLS

HSS & COBALT REAMER SETS

# Decimal Equivalent Chart

## DECIMAL EQUIVALENTS AND TAP SIZES OF FRACTION, WIRE, LETTER AND METRIC 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	
.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	3/8-18NPT 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	
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	1/2-14NPT PIPE
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	m2.3x0.4	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	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	1/8-27NPT PIPE	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	1/8-27NPT 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	
77	.0180	3/32	.0938		5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	3/4-14NPT PIPE
.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	
.55mm	.0217	39	.0995	m3x0.5	5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
74	.0225	38	.1015	#5-40	7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
.6mm	.0236	2.6mm	.1024		2	.2210		3/8	.3750		25mm	.9843	m27x2
73	.0240	37	.1040	#5-44	5.7mm	.2244		V	.3770		63/64	.9844	1-1/8-7NC
72	.0250	2.7mm	.1063		5.75mm	.2264		9.6mm	.3780		1	1.0000	
.65mm	.0256	36	.1065	#6-32	1	.2280		9.7mm	.3819		25.5mm	1.0039	
71	.0260	2.75mm	.1083		5.8mm	.2283		9.75mm	.3839		1-1/64	1.0156	
.7mm	.0276	7/64	.1094		5.9mm	.2323		9.8mm	.3858		26mm	1.0236	
70	.0280	35	.1100		A	.2340		W	.3860		1-1/32	1.0312	
69	.0292	2.8mm	.1102		15/64	.2344		9.9mm	.3898		26.5mm	1.0433	m30x3.5
.75mm	.0295	34	.1110		6mm	.2362	m7x1	25/64	.3906	7/16-20	1-3/64	1.0469	1-1/8-12NF
68	.0310	33	.1130	#6-40	B	.2380		10mm	.3937	m12x1.75	1-1/16	1.0625	
1/32	.0312	2.9mm	.1142	m3.5x0.6	6.1mm	.2402		X	.3970		27mm	1.0630	
.8mm	.0315	32	.1160		C	.2420		Y	.4040		1-5/64	1.0781	
67	.0320	3mm	.1181		6.2mm	.2441		13/32	.4062		27.5mm	1.0827	
66	.0330	31	.1200		D	.2460		Z	.4130		1-3/32	1.0938	
.85mm	.0335	3.1mm	.1220		6.25mm	.2461	1/16-27 NPT PIPE	10.5mm	.4134	m12x1.25	28mm	1.1024	m30x2.0
65	.0350	1/8	.1250	5/32-32NS	6.3mm	.2480		27/64	.4219	1/2-13	1-7/64	1.1094	1-1/4-7NC
.9mm	.0354	3.2mm	.1260		E	.2500	1/16-27 NPS PIPE	11mm	.4331		28.5mm	1.1220	
64	.0360	3.25mm	.1280		1/4	.2500		7/16	.4375	1/4-18 NPT PIPE	1-1/8	1.1250	
63	.0370	30	.1285	5/32-36NS	6.4mm	.2520		11.5mm	.4528		1-9/64	1.1406	
.95mm	.0374	3.3mm	.1299	m4x0.70	6.5mm	.2559		29/64	.4531	1/4-18 <sup>NPS</sup> PIPE 1/2-20	29mm	1.1417	
62	.0380	3.4mm	.1339		F	.2570	5/16-18NC	15/32	.4688		1-5/32	1.1562	1-11/2NPT PIPE
61	.0390	29	.1360	#8-32	6.6mm	.2598		12mm	.4724	m14x2	29.5mm	1.1614	
1mm	.0394	3.5mm	.1378		G	.2610		31/64	.4844	9/16-12	1-11/64	1.1719	1-1/4-12NF
60	.0400	28	.1405		6.7mm	.2638		12.5mm	.4921	m14x1.5			
59	.0410	9/64	.1406		17/64	.2656		1/2	.5000				
1.05mm	.0413	3.6mm	.1417		6.75mm	.2657	m8x1.25	13mm	.5118	m14x1.25			
								33/64	.5156	9/16-18			

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