

# PROFORMA TOOLS

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## 2015

### PRODUCT CATALOG



PREMIUM QUALITY, AMERICAN MADE CUTTING TOOLS FOR PRECISION MACHINING

*Full offering of HIGH PERFORMANCE tools*

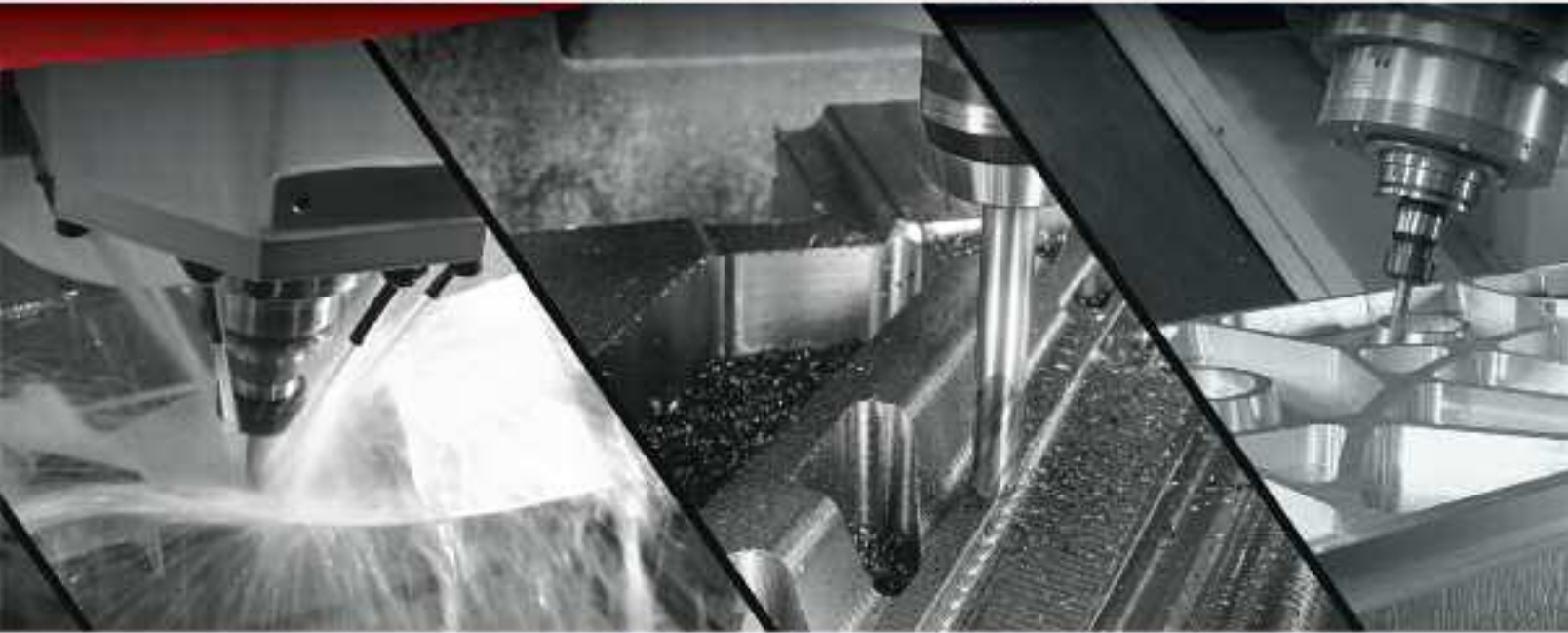
Endmills ■ Micro Endmills ■ Threadmills ■ Drill Mills ■ Drills  
Chamfer Mills ■ Reamers ■ Burs ■ Countersinks ■ Taps & Dies







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

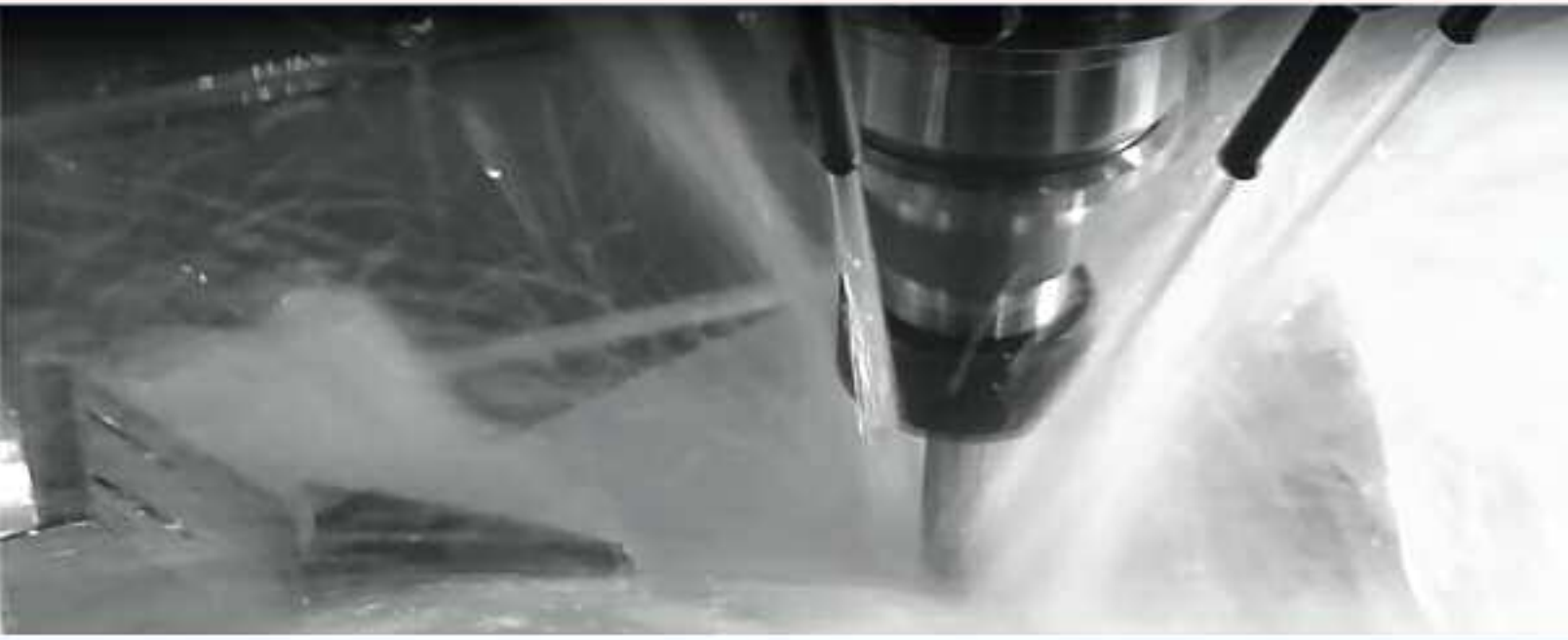


**ALL TOOLS ARE 100% MADE IN THE USA**



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

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





## **HIGH-PERFORMANCE TOOLS**

Endmills ▪ Taps

### **SOLID CARBIDE TOOLS**

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

### **HIGH SPEED STEEL TOOLS**

Drills ▪ Taps & Dies ▪ Reamers  
Endmills ▪ Countersinks

### **COBALT TOOLS**

Drills ▪ Endmills ▪ Reamers

*Physical Vapor Deposition Coatings*

# **PVD Coatings**

*Increases cutting tool performance in terms of wear resistance, abrasion prevention, corrosion and oxidation at high temperatures.*



**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.**



# PVD Coatings



## ALTIN

ALTIN is a high performance coating for milling, tapping and drilling in stainless steels, carbon steels, alloy steels, 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. This coating is highly recommended for titanium, high temperature alloys, and hardened and tempered tool steels with 35 HRC or greater.

## TICN

TICN is a general purpose coating used for milling, drilling and tapping 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, and generally used in applications with lower cutting speeds.



**"High Performance" CARBIDE ENDMILLS** pages 11 - 41**HP HIGH PERFORMANCE ENDMILLS**

<b>HP</b> VI-PRO - Information Page	11
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Stub & Regular Length - Square End - ALTiN & ALCRO-MAX	12
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Long & Extra Long Length - Square End - ALTiN & ALCRO-MAX	13
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Stub Length -  Corner Radius - ALTiN & ALCRO-MAX	14
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Regular Length -  Corner Radius - ALTiN & ALCRO-MAX	15
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Long Length -  Corner Radius - ALTiN & ALCRO-MAX	16
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Extra Long Length -  Corner Radius - ALTiN & ALCRO-MAX	17
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Stub & Regular Length - Ball Nose - ALTiN & ALCRO-MAX	18
<b>HP</b> VI-PRO - Variable Index - 4 Flute - Long & Extra Long Length - Ball Nose - ALTiN & ALCRO-MAX	19
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Stub & Regular Length - Square End - ALTiN & ALCRO-MAX	20
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Long & Extra Long Length - Square End - ALTiN & ALCRO-MAX	21
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Stub Length -  Corner Radius - ALTiN & ALCRO-MAX	22
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Regular Length -  Corner Radius - ALTiN & ALCRO-MAX	23
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Long Length -  Corner Radius - ALTiN & ALCRO-MAX	24
<b>HP</b> VI-PRO - Variable Index - 5 Flute - Extra Long Length -  Corner Radius - ALTiN & ALCRO-MAX	25
<b>HP</b> TERMINATOR - 6 Flute - 40° - Regular Length - Square End &  Corner Radius - ALTiN & ALCRO-MAX	26
<b>HP</b> TERMINATOR - 6 Flute - 40° - Long Length - Square End &  Corner Radius - ALTiN & ALCRO-MAX	27
<b>HP</b> Fine Pitch Roughers - Stub Length - 4 Flute - 30° - Uncoated, ALTiN & ALCRO-MAX	28 - 29
<b>HP</b> Fine Pitch Roughers - Regular Length - 4 Flute - 30° - Uncoated, ALTiN & ALCRO-MAX	30
<b>HP</b> Fine Pitch Roughers - Long Length - 4 Flute - 30° - Uncoated, ALTiN & ALCRO-MAX	31
<b>HP</b> Fine Pitch Roughers - Regular Length - 4 Flute - 30° - Ball Nose - Uncoated, ALTiN & ALCRO-MAX	32
<b>HP</b> Rougher/Finisher - Regular Length - 4 Flute - 40° -  Corner Radius - Uncoated & ALTiN	33
<b>HP</b> Regular Length - 3 Flute - 60° - Square End &  Corner Radius - Uncoated & ALTiN	34
<b>HP</b> Regular Length - 3 Flute - 45° - Square End &  Corner Radius - Uncoated & ALTiN	35
<b>HP</b> Stub Length - 5 Flute - 45° - Square End &  Corner Radius - Uncoated & ALTiN	36
<b>HP</b> Regular Length - 5 Flute - 45° - Square End &  Corner Radius - Uncoated & ALTiN	37
<b>HP</b> Regular Length - 2 Flute - 45° - For Aluminum - Uncoated & ZRN	38
<b>HP</b> Regular Length - 2 Flute - 45° - For Aluminum -  Corner Radius - Uncoated & ZRN	38
<b>HP</b> Long Length - 2 Flute - 45° - For Aluminum - Square End - Uncoated & ZRN	39
<b>HP</b> Long Length - 2 Flute - 45° - For Aluminum -  Corner Radius - Uncoated & ZRN	39
<b>HP</b> Regular Length - 3 Flute - 45° - For Aluminum - Square End - Uncoated & ZRN	40
<b>HP</b> Regular Length - 3 Flute - 45° - For Aluminum -  Corner Radius - Uncoated & ZRN	40
<b>HP</b> Long Length - 3 Flute - 45° - For Aluminum - Square End - Uncoated & ZRN	41
<b>HP</b> Long Length - 3 Flute - 45° - For Aluminum -  Corner Radius - Uncoated & ZRN	41









PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.



## PREMIUM CARBIDE pages 42 - 103

### GENERAL PURPOSE ENDMILLS

#### SINGLE END



Regular Length - 4 Flute - Square End - Uncoated, ALTiN & TiCN	42
Long & Extra Long Length - 4 Flute - Square End - Uncoated, ALTiN & TiCN	43
Regular Length - 4 Flute - Ball Nose - Uncoated, ALTiN & TiCN	44
Long & Extra Long Length - 4 Flute - Ball Nose - Uncoated, ALTiN & TiCN	45
Regular Length - 2 Flute - Square End - Uncoated, ALTiN & TiCN	46
Long & Extra Long Length - 2 Flute - Square End - Uncoated, ALTiN & TiCN	47
Regular Length - 2 Flute - Ball Nose - Uncoated, ALTiN & TiCN	48
Long & Extra Long Length - 2 Flute - Ball Nose - Uncoated, ALTiN & TiCN	49
Regular Length - 2 Flute -  Corner Radius - Uncoated	50
Regular Length - 2 Flute -  Corner Radius - ALTiN	51
Regular Length - 4 Flute -  Corner Radius - Uncoated	52
Regular Length - 4 Flute -  Corner Radius - ALTiN	53
Long Length - 4 Flute -  Corner Radius - Uncoated	54
Long Length - 4 Flute -  Corner Radius - ALTiN	55
Extra Long Length - 4 Flute -  Corner Radius - Uncoated	56
Extra Long Length - 4 Flute -  Corner Radius - ALTiN	57
Regular Length - Metric - 4 Flute - Square End - Uncoated & ALTiN	58
Stub Length - 2 Flute & 4 Flute - Square End & Ball Nose - Uncoated & ALTiN	59

### GENERAL PURPOSE ENDMILLS

#### DOUBLE END

Stub Length - 2 Flute & 4 Flute - Square End & Ball Nose - Uncoated & ALTiN	60 - 61
Regular Length - 2 Flute & 4 Flute - Square End & Ball Nose - Uncoated & ALTiN	62 - 63

### MICRO ENDMILLS

2 Flute - Square End & Ball Nose - Uncoated & ALTiN	64 - 65
4 Flute - Square End & Ball Nose - Uncoated & ALTiN	66 - 67
2 Flute - Stub Flute - Square End & Ball Nose - Uncoated & ALTiN	68
4 Flute - Stub Flute - Square End & Ball Nose - Uncoated & ALTiN	69
4 Flute - Stub Flute -  Corner Radius - Uncoated & ALTiN	70
4 Flute -  Corner Radius - Uncoated & ALTiN	71

### THREADMILLS

Internal/External Threads - UN Thread - ALTiN	72
Internal/External Threads - UN Threads - Coolant Fed - ALTiN	72
Internal/External Threads - NPT Pipe Threads - ALTiN	72
Internal/External Threads - NPTF Pipe Threads & Metric Threads - ALTiN	73

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

**PREMIUM CARBIDE** pages 42 - 103**DRILL MILLS**

2 & 4 Flute - 60° Point - Uncoated & ALTIN	74 - 75
2 & 4 Flute - 90° Point - Uncoated & ALTIN	76 - 77

**CHAMFER MILLS**

Single End - 2 & 4 Flute - 60°, 82°, 90°, 100°, 120° Point - Uncoated & ALTIN	78
Double End - 2 & 4 Flute - 60°, 82°, 90°, 100°, 120° Point - Uncoated & ALTIN	79

**CARBIDE DRILLS**

N/C Spotting - 90°, 120° & 140° - Uncoated & ALTIN	80 - 81
Jobber Length - 118° Split Point - Fractional, Letter, Wire & Metric Sizes - Uncoated & ALTIN	82 - 83
Stub Length - 135° Split Point - Fractional, Letter & Wire Sizes - Uncoated & ALTIN	84 - 85
Straight Flute - 140° Split Point - Fractional, Letter & Wire Sizes - Uncoated & ALTIN	86 - 87

**CARBIDE REAMERS**

Straight Flute - Fractional, Wire, Letter, Metric & Decimal	88 - 92
Special Sizes - Quantity Pricing	93

**BURS**

Cylindrical SA • Cylindrical End Cut SB	94 - 95
Cylindrical Ball Nose SC • Ball Shape SD	96 - 97
Egg Shape SE • Round Nose Tree SF	98 - 99
Pointed Tree SG • Flame Shape SH	100
Included Angle SJ • SK	101
Included Angle With Radius SL • Pointed Cone SM • Inverted Taper SN • Bur Sets	102 - 103

**COUNTERSINKS** pages 104 - 107

Single Flute, 3 Flute & 6 Flute - Carbide - 60°, 82°, 90° & 100°	104
Combined Drill & Countersinks - Carbide 60° • HSS 60° • M42 Cobalt 60°	105
Combined Drill & Countersinks - HSS - Long Length 60° • Bell Type 60°	106
Combined Drill & Countersinks - HSS • Four Flute Machine • Single Flute	107

**ENDMILLS – HSS & M42 COBALT** pages 108 - 115

Single End - 2 Flute, 4 Flute & 6 Flute - Square End - 30° Helix - HSS - Uncoated & ALTIN	108 - 109
Double End - 2 Flute & 4 Flute - Square End - 30° Helix - HSS - Uncoated & ALTIN	110 - 111
Single End - 2 Flute, 4 Flute & 6 Flute - Square End - 30° Helix - M42 Cobalt - Uncoated & ALTIN	112 - 113
Double End - 2 Flute & 4 Flute - Square End - 30° Helix - M42 Cobalt - Uncoated & ALTIN	114
Roughing - Coarse & Fine Pitch - M42 Cobalt - Uncoated & ALTIN	115

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

## TAPS & DIES pages 116 - 144

### HP HIGH PERFORMANCE TAPS

HP PREDATOR - Spiral Point - Uncoated, Steam Oxide, ALTIN & TICN	116
HP PREDATOR - Metric - Spiral Point - Uncoated, Steam Oxide, ALTIN & TICN	117
HP PREDATOR - Spiral Flute Semi Bottoming - Uncoated, Steam Oxide, ALTIN & TICN	118
HP PREDATOR - Metric - Spiral Flute Semi Bottoming - Uncoated, Steam Oxide, ALTIN & TICN	119

### GENERAL PURPOSE GROUND THREAD TAPS

Hand - Taper, Plug, Bottom & Sets - HSS	120 - 123
Hand - Taper, Plug & Bottom - HSS - Steam Oxide	124
Hand - Plug & Bottom - HSS - Nitride & Steam Oxide	125
Hand - Taper, Plug, Bottom & Sets - HSS - TIN	126
Hand - Metric - Taper, Plug, Bottom & Sets - HSS - Uncoated	127
Hand - Metric - Taper, Plug, Bottom & Sets - HSS - TIN	128
Spiral Point Plug - HSS	129
Spiral Point Plug - HSS - Steam Oxide, Nitride & Steam Oxide	130
Spiral Point Plug - HSS - TIN & ALTIN	131
Spiral Point Plug - Metric - HSS - Uncoated & TIN	132
Spiral Point Bottoming - HSS - Uncoated & TIN	132
Hi Spiral Flute Semi Bottoming - HSS	133
Hi Spiral Flute Semi Bottoming - Metric - HSS	133
Thread Forming - Single Thread Chamfer, Bottom, Plug - HSS	134
Thread Forming - Metric - Single Thread Chamfer, Bottom, Plug - HSS	134
Thread Forming - Single Thread Chamfer, Bottom, Plug - HSS - TIN	135
Thread Forming - Metric - Single Thread Chamfer, Bottom, Plug - HSS - TIN	135
Combination Drill & Tap - HSS	136
Combination Drill & Tap - Metric - HSS	136
Taper Pipe NPT • Taper Pipe NPT Interrupted - HSS - Uncoated, Steam Oxide & TIN	137
Taper Pipe NPTF • Taper Pipe NPTF Interrupted - HSS - Uncoated & TIN	138
Straight Pipe NPS • NPT Extension Taper Pipe - HSS - Uncoated & TIN	139
STI - Screw Thread Insert • +.005 Oversize - HSS	140
Pulley - Plug • Small Shank Extension - Spiral Point Plug - HSS	141

### DIES

Adjustable Round Split - HSS • Die Stocks	142
Adjustable Round Split • Hexagon Rethreading - Carbon Steel	143
NPT Hexagon Rethreading • Metric Hexagon Rethreading - Carbon Steel	144
T-Handle Tap Wrenches	144

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

**DRILLS – HSS & M42 COBALT** pages 145 - 167

Drill Sets	145 - 147
Jobber Length - 118° Point - HSS - Bright, TIN & Oxided	148 - 150
Jobber Length - Metric - 118° Point - HSS - Oxided	151
Jobber Length - Heavy Duty - 135° Split Point - HSS - Oxided & Black/Gold	152 - 153
Mechanics Length - Heavy Duty - 135° Split Point - Black/Gold - Flatted Shank - HSS	154
Screw Machine Length - Heavy Duty - 135° Split Point - HSS - Oxided	155
Taper Length - 118° Point - HSS - Oxided	156
Taper Shank - 118° Point - HSS - Oxided	157
Screw Machine Length - Heavy Duty - 135° Split Point - M42 Cobalt - Straw Finish & ALTIN	158 - 159
Jobber Length - Heavy Duty - 135° Split Point - M42 Cobalt - Straw Finish & ALTIN	160 - 161
Silver & Deming - HSS, Cobalt & Black/Gold	162 - 163
A/C Extension - 6" & 12" Overall Length - HSS & M42 Cobalt	164 - 165
Extra Length - 12" Overall Length - HSS - Bright	166
Reduced Shank - 1/4" & 3/8" - 118° Point - HSS - Oxided	166
Screw Extractors • Drill Drifts - HSS - Oxided	167

**REAMERS – HSS & M42 COBALT** pages 168 - 190

Chucking - Straight Shank - Straight Flute - HSS & M42 Cobalt	168 - 173
Chucking - Intermediate Sizes - HSS Only	174 - 177
Chucking - Straight Shank - Straight Flute - Special Sizes - HSS & M42 Cobalt	178 - 179
Chucking - Straight Shank - Right Hand Spiral - Right Hand Cut - HSS & M42 Cobalt	180 - 183
Dowel Pin Sizes - HSS & M42 Cobalt	184
Taper Shank - Straight Flute - HSS	184
Expansion - HSS	185
Hand - Straight Shank - Straight Flute & Left Hand Spiral - Right Hand Cut - HSS	186
Taper Pipe • Taper Pin - HSS	187
Capscrew Counterbores - HSS	188
Construction - Black/Gold • Safety Reamers • Bridge Reamers - HSS	189
Reamer Sets - HSS & M42 Cobalt	190

**TECHNICAL INFORMATION** pages 191 - 208




# Carbide Endmills

HIGH PERFORMANCE

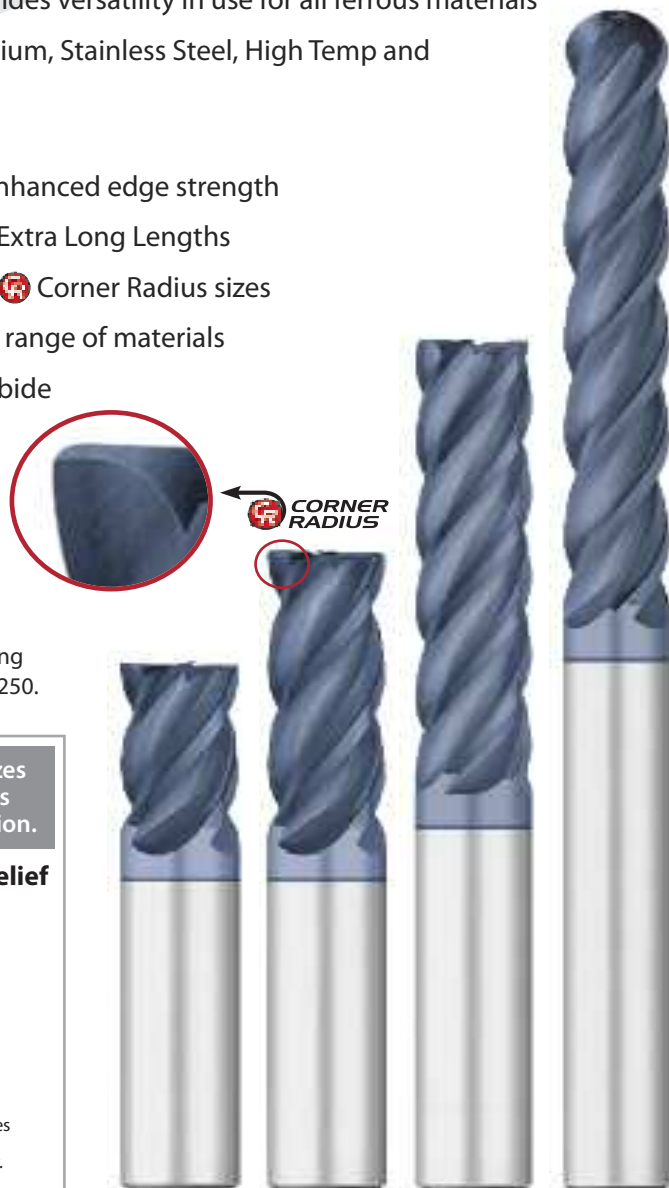
## VI-PRO

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, Ball Nose and various  Corner Radius sizes
- Offered in ALTiN & ALCRO-MAX to cover a wide range of materials
- Made in the USA from premium micrograin carbide

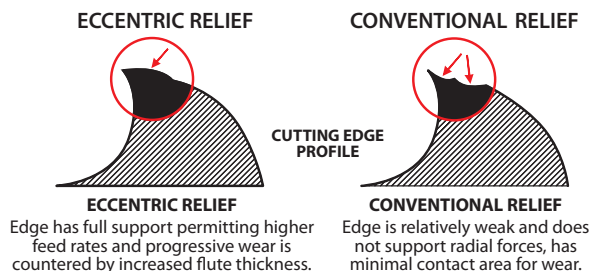
### Why use our Corner Radius tools?

- 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 0.250.



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

#### Advantages of Eccentric Relief vs Conventional Relief



# Carbide Endmills

**HIGH PERFORMANCE**

## 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	25.99	-	-	257338	28.51	-	-
3/16	3/16	3/8	2	4	245832	33.45	-	-	257349	36.79	-	-
1/4	1/4	3/8	2	4	245843	37.84	-	-	245942	41.63	-	-
5/16	5/16	7/16	2	4	245854	55.05	-	-	245953	60.56	-	-
3/8	3/8	1/2	2	4	245865	61.03	-	-	245964	67.13	-	-
7/16	7/16	5/8	2-1/2	4	257327	79.50	-	-	257360	87.45	-	-
1/2	1/2	5/8	2-1/2	4	245876	91.25	245909	96.45	245975	100.38	246008	106.09
5/8	5/8	3/4	3	4	245887	179.65	245920	184.84	245986	188.63	246019	194.09
3/4	3/4	1	3	4	245898	236.94	245931	242.13	245997	248.78	246030	254.24

**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	31.06	-	-	257426	34.16	-	-
3/16	3/16	9/16	2	4	246272	35.50	-	-	257437	39.05	-	-
1/4	1/4	3/4	2-1/2	4	246283	45.06	-	-	246426	49.56	-	-
5/16	5/16	13/16	2-1/2	4	246294	59.68	-	-	246437	65.64	-	-
3/8	3/8	1	2-1/2	4	246305	69.91	-	-	246448	76.90	-	-
7/16	7/16	1	2-3/4	4	257415	86.69	-	-	257448	95.36	-	-
1/2	1/2	1	3	4	246316	104.86	246371	110.05	246459	115.35	246514	121.06
1/2	1/2	1-1/4	3	4	246327	104.86	246382	110.05	246470	115.35	246525	121.06
5/8	5/8	1-5/8	3-1/2	4	246338	189.83	246393	195.02	246481	199.32	246536	204.77
3/4	3/4	1-5/8	4	4	246349	262.28	246404	267.48	246492	275.40	246547	280.85
1	1	2	4	4	246360	489.61	246415	494.80	246503	514.09	246558	519.54

**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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

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

# Carbide Endmills

HIGH PERFORMANCE

## 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	51.32	-	-	247944	56.45	-	-
5/16	5/16	1-1/8	3	4	247812	71.00	-	-	247955	78.10	-	-
3/8	3/8	1-1/4	3	4	247823	95.36	-	-	247966	104.89	-	-
7/16	7/16	2	4	4	257591	120.95	-	-	257602	133.05	-	-
1/2	1/2	1-1/2	4	4	247834	131.66	247889	136.85	247977	144.83	248032	150.54
1/2	1/2	2	4	4	247845	145.99	247900	151.19	247988	160.59	248043	166.31
5/8	5/8	2-1/4	5	4	247856	271.53	247911	276.72	247999	285.10	248054	290.56
3/4	3/4	2-1/4	5	4	247867	328.55	247922	333.75	248010	344.98	248065	350.43
1	1	2-1/4	5	4	247878	541.49	247933	546.69	248021	568.57	248076	574.02

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	61.30	-	-	248813	67.43	-	-
3/8	3/8	2	4	4	248670	107.46	-	-	248824	118.20	-	-
7/16	7/16	3	6	4	257657	176.20	-	-	257668	193.82	-	-
1/2	1/2	3	6	4	248681	205.88	248747	211.07	248835	226.47	248901	232.18
5/8	5/8	3	6	4	248692	292.82	248758	298.01	248846	307.46	248912	312.92
3/4	3/4	3	6	4	248703	386.51	248769	391.71	248857	405.84	248923	411.29
3/4	3/4	4	7	4	248714	634.72	248780	639.92	248868	666.46	248934	671.91
1	1	3	6	4	248725	630.15	248791	635.34	248879	661.66	248945	667.11
1	1	4-1/4	7	4	248736	930.23	248802	935.80	248890	975.91	248956	981.48

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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

TOLERANCES	DIAMETER	SHANK
1/4" - 1/2"	+0.000, -0.002	-0.001, -0.004
5/8" - 1"	+0.000, -0.003	-0.001, -0.004

# Carbide Endmills

**HIGH PERFORMANCE**

## VI-PRO

**VARIABLE INDEX**

**STUB LENGTH - 4 FLUTE -  CORNER RADIUS**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	29.96	-	-	257382	32.96	-	-
3/16	3/16	3/8	2	4	0.008	246052	37.41	-	-	257393	41.15	-	-
1/4	1/4	3/8	2	4	0.015	246063	44.10	-	-	246162	48.51	-	-
5/16	5/16	7/16	2	4	0.015	246074	59.36	-	-	246173	65.30	-	-
3/8	3/8	1/2	2	4	0.015	246085	65.34	-	-	246184	71.87	-	-
7/16	7/16	5/8	2-1/2	4	0.030	257371	83.72	-	-	257404	92.09	-	-
1/2	1/2	5/8	2-1/2	4	0.030	246096	99.87	246129	105.07	246195	109.86	246228	115.58
5/8	5/8	3/4	3	4	0.030	246107	188.27	246140	193.47	246206	197.69	246239	203.14
3/4	3/4	1	3	4	0.030	246118	245.56	246151	250.75	246217	257.84	246250	263.29

**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*

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.000, -.002	-.0001, -.0004	+0.001, -.001
5/8" - 3/4"	+0.000, -.003	-.0001, -.0004	+0.001, -.001



# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

REGULAR LENGTH - 4 FLUTE -  CORNER RADIUS



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	35.02	-	-	257492	38.53	-	-	
1/8	1/8	1/2	2	4	0.020	246580	35.02	-	-	257503	38.53	-	-	
1/8	1/8	1/2	2	4	0.030	246591	35.02	-	-	257514	38.53	-	-	
3/16	3/16	9/16	2	4	0.010	246602	39.47	-	-	257525	43.41	-	-	
3/16	3/16	9/16	2	4	0.020	246613	39.47	-	-	257536	43.41	-	-	
3/16	3/16	9/16	2	4	0.030	246624	39.47	-	-	257547	43.41	-	-	
1/4	1/4	3/4	2-1/2	4	0.015	246635	49.02	-	-	247218	53.93	-	-	
1/4	1/4	3/4	2-1/2	4	0.030	246646	49.02	-	-	247229	53.93	-	-	
1/4	1/4	3/4	2-1/2	4	0.060	246657	49.02	-	-	247240	53.93	-	-	
5/16	5/16	13/16	2-1/2	4	0.015	246668	63.16	-	-	247251	69.47	-	-	
5/16	5/16	13/16	2-1/2	4	0.030	246679	63.16	-	-	247262	69.47	-	-	
5/16	5/16	13/16	2-1/2	4	0.060	246690	63.16	-	-	247273	69.47	-	-	
3/8	3/8	1	2-1/2	4	0.015	246701	73.75	-	-	247284	81.13	-	-	
3/8	3/8	1	2-1/2	4	0.030	246712	73.75	-	-	247295	81.13	-	-	
3/8	3/8	1	2-1/2	4	0.060	246723	73.75	-	-	247306	81.13	-	-	
7/16	7/16	1	2-3/4	4	0.015	257459	96.25	-	-	257558	105.88	-	-	
7/16	7/16	1	2-3/4	4	0.030	257470	96.25	-	-	257569	105.88	-	-	
7/16	7/16	1	2-3/4	4	0.060	257481	96.25	-	-	257580	105.88	-	-	
1/2	1/2	1	3	4	0.015	246734	117.82	246976	123.72	247317	129.60	247559	136.09	
1/2	1/2	1	3	4	0.030	246745	117.82	246987	123.72	247328	129.60	247570	136.09	
1/2	1/2	1	3	4	0.060	246756	117.82	246998	123.72	247339	129.60	247581	136.09	
1/2	1/2	1	3	4	0.090	246767	117.82	247009	123.72	247350	129.60	247592	136.09	
1/2	1/2	1	3	4	0.120	246778	117.82	247020	123.72	247361	129.60	247603	136.09	
1/2	1/2	1-1/4	3	4	0.015	246789	117.82	247031	123.72	247372	129.60	247614	136.09	
1/2	1/2	1-1/4	3	4	0.030	246800	117.82	247042	123.72	247383	129.60	247625	136.09	
1/2	1/2	1-1/4	3	4	0.060	246811	117.82	247053	123.72	247394	129.60	247636	136.09	
1/2	1/2	1-1/4	3	4	0.090	246822	117.82	247064	123.72	247405	129.60	247647	136.09	
1/2	1/2	1-1/4	3	4	0.120	246833	117.82	247075	123.72	247416	129.60	247658	136.09	
5/8	5/8	1-5/8	3-1/2	4	0.030	246844	198.50	247086	203.70	247427	208.43	247669	213.88	
5/8	5/8	1-5/8	3-1/2	4	0.060	246855	198.50	247097	203.70	247438	208.43	247680	213.88	
5/8	5/8	1-5/8	3-1/2	4	0.090	246866	198.50	247108	203.70	247449	208.43	247691	213.88	
5/8	5/8	1-5/8	3-1/2	4	0.120	246877	198.50	247119	203.70	247460	208.43	247702	213.88	
3/4	3/4	1-5/8	4	4	0.030	246888	275.27	247130	280.46	247471	289.03	247713	294.48	
3/4	3/4	1-5/8	4	4	0.060	246899	275.27	247141	280.46	247482	289.03	247724	294.48	
3/4	3/4	1-5/8	4	4	0.090	246910	275.27	247152	280.46	247493	289.03	247735	294.48	
3/4	3/4	1-5/8	4	4	0.120	246921	275.27	247163	280.46	247504	289.03	247746	294.48	
3/4	3/4	1-5/8	4	4	0.190	261982	275.27	262026	280.46	262070	289.03	262114	294.49	
3/4	3/4	1-5/8	4	4	0.250	261993	275.27	262037	280.46	262081	289.03	262125	294.49	
1	1	2	4	4	0.030	246932	502.59	247174	507.79	247515	527.72	247757	533.18	
1	1	2	4	4	0.060	246943	502.59	247185	507.79	247526	527.72	247768	533.18	
1	1	2	4	4	0.090	246954	502.59	247196	507.79	247537	527.72	247779	533.18	
1	1	2	4	4	0.120	246965	502.59	247207	507.79	247548	527.72	247790	533.18	
1	1	2	4	4	0.190	262004	502.60	262048	507.79	262092	527.72	262136	533.18	
1	1	2	4	4	0.250	262015	502.60	262059	507.79	262103	527.72	262147	533.18	

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.01, -0.01
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.01, -0.01

# Carbide Endmills

**HIGH PERFORMANCE**

## VI-PRO

**VARIABLE INDEX**

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



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	55.28	-	-	248373	60.81	-	-
1/4	1/4	1-1/8	3	4	0.030		248098	55.28	-	-	248384	60.81	-	-
5/16	5/16	1-1/8	3	4	0.015		248109	75.31	-	-	248395	82.84	-	-
5/16	5/16	1-1/8	3	4	0.030		248120	75.31	-	-	248406	82.84	-	-
3/8	3/8	1-1/4	3	4	0.030		248131	99.67	-	-	248417	109.63	-	-
3/8	3/8	1-1/4	3	4	0.060		248142	99.67	-	-	248428	109.63	-	-
7/16	7/16	2	4	4	0.030		257613	128.01	-	-	257635	140.81	-	-
7/16	7/16	2	4	4	0.060		257624	128.01	-	-	257646	140.81	-	-
1/2	1/2	1-1/2	4	4	0.030		248153	140.28	248263	145.48	248439	154.31	248549	160.02
1/2	1/2	1-1/2	4	4	0.060		248164	140.28	248274	145.48	248450	154.31	248560	160.02
1/2	1/2	2	4	4	0.030		248175	154.62	248285	159.81	248461	170.08	248571	175.79
1/2	1/2	2	4	4	0.060		248186	154.62	248296	159.81	248472	170.08	248582	175.79
5/8	5/8	2-1/4	5	4	0.030		248197	280.15	248307	285.34	248483	294.16	248593	299.61
5/8	5/8	2-1/4	5	4	0.060		248208	280.15	248318	285.34	248494	294.16	248604	299.61
3/4	3/4	2-1/4	5	4	0.030		248219	352.78	248329	359.53	248505	370.42	248615	377.51
3/4	3/4	2-1/4	5	4	0.060		248230	352.78	248340	359.53	248516	370.42	248626	377.51
1	1	2-1/4	5	4	0.030		248241	550.12	248351	555.31	248527	577.62	248637	583.08
1	1	2-1/4	5	4	0.060		248252	550.12	248362	555.31	248538	577.62	248648	583.08

**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*

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.01, -0.01
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.01, -0.01

# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

EXTRA LONG LENGTH - 4 FLUTE -  CORNER RADIUS



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	67.28	-	-	249275	74.00	-	-
1/4	1/4	1-1/2	4	4	0.030	248978	67.28	-	-	249286	74.00	-	-
3/8	3/8	2	4	4	0.030	248989	113.95	-	-	249297	125.34	-	-
3/8	3/8	2	4	4	0.060	249000	113.95	-	-	249308	125.34	-	-
7/16	7/16	3	6	4	0.030	257679	180.48	-	-	257701	198.52	-	-
7/16	7/16	3	6	4	0.060	257690	180.48	-	-	257712	198.53	-	-
1/2	1/2	3	6	4	0.030	249011	212.37	249143	217.56	249319	233.61	249451	239.32
1/2	1/2	3	6	4	0.060	249022	212.37	249154	217.56	249330	233.61	249462	239.32
5/8	5/8	3	6	4	0.030	249033	299.26	249165	304.45	249341	314.22	249473	319.68
5/8	5/8	3	6	4	0.060	249044	299.26	249176	304.45	249352	314.22	249484	319.68
3/4	3/4	3	6	4	0.030	249055	395.14	249187	400.33	249363	414.89	249495	420.35
3/4	3/4	3	6	4	0.060	249066	395.14	249198	400.33	249374	414.89	249506	420.35
3/4	3/4	4	7	4	0.030	249077	643.34	249209	648.54	249385	675.51	249517	680.96
3/4	3/4	4	7	4	0.060	249088	643.34	249220	648.54	249396	675.51	249528	680.96
1	1	3	6	4	0.030	249099	646.77	249231	651.96	249407	679.11	249539	684.56
1	1	3	6	4	0.060	249110	646.77	249242	651.96	249418	679.11	249550	684.56
1	1	4-1/4	7	4	0.030	249121	939.14	249253	944.71	249429	984.82	249561	990.39
1	1	4-1/4	7	4	0.060	249132	939.14	249264	944.71	249440	984.82	249572	990.39

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



FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

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

# Carbide Endmills

**HIGH PERFORMANCE**

## VI-PRO

**VARIABLE INDEX**

**STUB LENGTH - 4 FLUTE - BALL NOSE**



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	254797	29.99	-	-	257734	32.99	-	-
3/16	3/16	3/8	2	4	254808	38.59	-	-	257745	42.45	-	-
1/4	1/4	3/8	2	4	254819	43.67	-	-	254918	48.04	-	-
5/16	5/16	7/16	2	4	254830	63.53	-	-	254929	69.88	-	-
3/8	3/8	1/2	2	4	254841	70.42	-	-	254940	77.46	-	-
7/16	7/16	5/8	2-1/2	4	257723	94.80	-	-	257756	104.28	-	-
1/2	1/2	5/8	2-1/2	4	254852	105.29	254885	111.28	254951	115.82	254984	122.41
5/8	5/8	3/4	3	4	254863	207.29	254896	213.28	254962	217.65	254995	223.95
3/4	3/4	1	3	4	254874	273.39	254907	279.38	254973	287.05	255006	293.35

**VARIABLE INDEX**

**REGULAR LENGTH - 4 FLUTE - BALL NOSE**



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	255017	35.84	-	-	257778	39.42	-	-
3/16	3/16	9/16	2	4	255028	40.97	-	-	257789	45.06	-	-
1/4	1/4	3/4	2-1/2	4	255039	52.00	-	-	255182	57.19	-	-
5/16	5/16	13/16	2-1/2	4	255050	68.86	-	-	255193	75.74	-	-
3/8	3/8	1	2-1/2	4	255061	80.66	-	-	255204	88.73	-	-
7/16	7/16	1	2-3/4	4	257767	110.33	-	-	257800	121.37	-	-
1/2	1/2	1	3	4	255072	121.00	255127	126.99	255215	133.09	255270	139.69
1/2	1/2	1-1/4	3	4	255083	121.00	255138	126.99	255226	133.09	255281	139.69
5/8	5/8	1-5/8	3-1/2	4	255094	219.04	255149	225.03	255237	229.99	255292	236.28
3/4	3/4	1-5/8	4	4	255105	302.63	255160	308.62	255248	317.76	255303	324.06
1	1	2	4	4	255116	564.94	255171	570.93	255259	593.18	255314	599.48

**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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

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



# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

LONG LENGTH - 4 FLUTE - BALL NOSE



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	255325	59.21	-	-	255468	65.13	-	-
5/16	5/16	1-1/8	3	4	255336	81.92	-	-	255479	90.11	-	-
3/8	3/8	1-1/4	3	4	255347	110.02	-	-	255490	121.02	-	-
7/16	7/16	2	4	4	257811	137.11	-	-	257822	150.82	-	-
1/2	1/2	1-1/2	4	4	255358	151.91	255413	157.90	255501	167.11	255556	173.70
1/2	1/2	2	4	4	255369	168.46	255424	174.45	255512	185.30	255567	191.89
5/8	5/8	2-1/4	5	4	255380	313.30	255435	319.29	255523	328.97	255578	335.26
3/4	3/4	2-1/4	5	4	255391	379.10	255446	385.09	255534	398.05	255589	404.35
1	1	2-1/4	5	4	255402	624.80	255457	630.79	255545	656.04	255600	662.34

VARIABLE INDEX

EXTRA LONG LENGTH - 4 FLUTE - BALL NOSE



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	255611	70.74	-	-	255765	77.81	-	-
3/8	3/8	2	4	4	255622	123.99	-	-	255776	136.39	-	-
7/16	7/16	3	6	4	257833	203.32	-	-	257844	223.65	-	-
1/2	1/2	3	6	4	255633	237.55	255699	243.54	255787	261.30	255853	267.90
5/8	5/8	3	6	4	255644	337.87	255710	343.87	255798	354.77	255864	361.05
3/4	3/4	3	6	4	255655	445.98	255721	451.97	255809	468.27	255875	474.57
3/4	3/4	4	7	4	255666	732.37	255732	738.37	255820	768.99	255886	775.29
1	1	3	6	4	255677	727.10	255743	733.09	255831	763.45	255897	769.75
1	1	4-1/4	7	4	255688	1,073.34	255754	1,079.77	255842	1,126.05	255908	1,132.47

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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191-193.

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

# Carbide Endmills

**HIGH PERFORMANCE**

## VI-PRO

**VARIABLE INDEX**  
**STUB LENGTH - 5 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
1/8	1/8	1/4	1-1/2	5	255919	28.59	-	-	257855	31.45	-	-
3/16	3/16	3/8	2	5	255930	36.79	-	-	257866	40.47	-	-
1/4	1/4	3/8	2	5	255941	41.63	-	-	256040	45.80	-	-
5/16	5/16	7/16	2	5	255952	60.56	-	-	256051	66.62	-	-
3/8	3/8	1/2	2	5	255963	67.13	-	-	256062	73.85	-	-
1/2	1/2	5/8	2-1/2	5	255974	100.38	256007	106.09	256073	110.41	256106	116.70
5/8	5/8	3/4	3	5	255985	197.62	256018	203.33	256084	207.49	256117	213.50
3/4	3/4	1	3	5	255996	260.63	256029	266.34	256095	273.66	256128	279.66

**VARIABLE INDEX**  
**REGULAR LENGTH - 5 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
1/8	1/8	1/2	2	5	256139	34.17	-	-	257877	37.58	-	-
3/16	3/16	9/16	2	5	256150	39.06	-	-	257888	42.96	-	-
1/4	1/4	3/4	2-1/2	5	256161	49.58	-	-	256304	54.52	-	-
5/16	5/16	13/16	2-1/2	5	256172	65.65	-	-	256315	72.20	-	-
3/8	3/8	1	2-1/2	5	256183	76.90	-	-	256326	84.59	-	-
1/2	1/2	1	3	5	256194	115.35	256249	121.06	256337	126.88	256392	133.17
1/2	1/2	1-1/4	3	5	256205	115.35	256260	121.06	256348	126.88	256403	133.17
5/8	5/8	1-5/8	3-1/2	5	256216	208.82	256271	214.53	256359	219.26	256414	225.25
3/4	3/4	1-5/8	4	5	256227	288.51	256282	294.22	256370	302.93	256425	308.94
1	1	2	4	5	256238	538.58	256293	544.29	256381	565.50	256436	571.51

**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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

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

# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

LONG LENGTH - 5 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	5	256447	56.45	-	-	256590	62.10	-	-
5/16	5/16	1-1/8	3	5	256458	78.09	-	-	256601	85.90	-	-
3/8	3/8	1-1/4	3	5	256469	104.89	-	-	256612	115.38	-	-
1/2	1/2	1-1/2	4	5	256480	144.83	256535	150.53	256623	159.31	256678	165.59
1/2	1/2	2	4	5	256491	160.60	256546	166.31	256634	176.65	256689	182.94
5/8	5/8	2-1/4	5	5	256502	298.68	256557	304.39	256645	313.62	256700	319.61
3/4	3/4	2-1/4	5	5	256513	361.41	256568	367.12	256656	379.48	256711	385.48
1	1	2-1/4	5	5	256524	595.65	256579	601.35	256667	625.43	256722	631.43

VARIABLE INDEX

EXTRA LONG LENGTH - 5 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	5	256733	67.43	-	-	256887	74.17	-	-
3/8	3/8	2	4	5	256744	118.21	-	-	256898	130.02	-	-
1/2	1/2	3	6	5	256755	226.46	256821	232.18	256909	249.11	256975	255.40
5/8	5/8	3	6	5	256766	322.09	256832	327.82	256920	338.21	256986	344.21
3/4	3/4	3	6	5	256777	425.18	256843	430.88	256931	446.42	256997	452.43
3/4	3/4	4	7	5	256788	698.18	256854	703.91	256942	733.10	257008	739.10
1	1	3	6	5	256799	693.16	256865	698.88	256953	727.82	257019	733.82
1	1	4-1/4	7	5	256810	1,023.25	256876	1,029.38	256964	1,073.50	257030	1,079.62

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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

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

# Carbide Endmills

**HIGH PERFORMANCE**

## VI-PRO

**VARIABLE INDEX**

**STUB LENGTH - 5 FLUTE -  CORNER RADIUS**



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	5	0.008	257041	32.95	-	-	257899	36.25	-	-
3/16	3/16	3/8	2	5	0.008	257052	41.15	-	-	257910	45.27	-	-
1/4	1/4	3/8	2	5	0.015	257063	48.52	-	-	257162	53.37	-	-
5/16	5/16	7/16	2	5	0.015	257074	65.30	-	-	257173	71.84	-	-
3/8	3/8	1/2	2	5	0.015	257085	71.87	-	-	257184	79.05	-	-
1/2	1/2	5/8	2-1/2	5	0.030	257096	109.86	257129	115.57	257195	120.85	257228	127.13
5/8	5/8	3/4	3	5	0.030	257107	207.10	257140	212.81	257206	217.46	257239	223.45
3/4	3/4	1	3	5	0.030	257118	270.11	257151	275.82	257217	283.62	257250	289.62

**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



FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

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



# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

REGULAR LENGTH - 5 FLUTE -  CORNER RADIUS



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	53.93	-	-	250166	59.32	-	-
1/4	1/4	3/4	2-1/2	5	0.030	249594	53.93	-	-	250177	59.32	-	-
1/4	1/4	3/4	2-1/2	5	0.060	249605	53.93	-	-	250188	59.32	-	-
5/16	5/16	13/16	2-1/2	5	0.015	249616	69.47	-	-	250199	76.42	-	-
5/16	5/16	13/16	2-1/2	5	0.030	249627	69.47	-	-	250210	76.42	-	-
5/16	5/16	13/16	2-1/2	5	0.060	249638	69.47	-	-	250221	76.42	-	-
3/8	3/8	1	2-1/2	5	0.015	249649	81.13	-	-	250232	89.24	-	-
3/8	3/8	1	2-1/2	5	0.030	249660	81.13	-	-	250243	89.24	-	-
3/8	3/8	1	2-1/2	5	0.060	249671	81.13	-	-	250254	89.24	-	-
1/2	1/2	1	3	5	0.015	249682	129.60	249924	136.09	250265	142.56	250507	149.70
1/2	1/2	1	3	5	0.030	249693	129.60	249935	136.09	250276	142.56	250518	149.70
1/2	1/2	1	3	5	0.060	249704	129.60	249946	136.09	250287	142.56	250529	149.70
1/2	1/2	1	3	5	0.090	249715	129.60	249957	136.09	250298	142.56	250540	149.70
1/2	1/2	1	3	5	0.120	249726	129.60	249968	136.09	250309	142.56	250551	149.70
1/2	1/2	1-1/4	3	5	0.015	249737	129.60	249979	136.09	250320	142.56	250562	149.70
1/2	1/2	1-1/4	3	5	0.030	249748	129.60	249990	136.09	250331	142.56	250573	149.70
1/2	1/2	1-1/4	3	5	0.060	249759	129.60	250001	136.09	250342	142.56	250584	149.70
1/2	1/2	1-1/4	3	5	0.090	249770	129.60	250012	136.09	250353	142.56	250595	149.70
1/2	1/2	1-1/4	3	5	0.120	249781	129.60	250023	136.09	250364	142.56	250606	149.70
5/8	5/8	1-5/8	3-1/2	5	0.030	249792	218.35	250034	224.07	250375	229.27	250617	235.27
5/8	5/8	1-5/8	3-1/2	5	0.060	249803	218.35	250045	224.07	250386	229.27	250628	235.27
5/8	5/8	1-5/8	3-1/2	5	0.090	249814	218.35	250056	224.07	250397	229.27	250639	235.27
5/8	5/8	1-5/8	3-1/2	5	0.120	249825	218.35	250067	224.07	250408	229.27	250650	235.27
3/4	3/4	1-5/8	4	5	0.030	249836	302.79	250078	308.51	250419	317.93	250661	323.93
3/4	3/4	1-5/8	4	5	0.060	249847	302.79	250089	308.51	250430	317.93	250672	323.93
3/4	3/4	1-5/8	4	5	0.090	249858	302.79	250100	308.51	250441	317.93	250683	323.93
3/4	3/4	1-5/8	4	5	0.120	249869	302.79	250111	308.51	250452	317.93	250694	323.93
3/4	3/4	1-5/8	4	5	0.190	264424	302.79	264468	308.51	264512	317.93	264556	323.93
3/4	3/4	1-5/8	4	5	0.250	264435	302.79	264479	308.51	264523	317.93	264567	323.93
1	1	2	4	5	0.030	249880	552.85	250122	558.57	250463	580.50	250705	586.49
1	1	2	4	5	0.060	249891	552.85	250133	558.57	250474	580.50	250716	586.49
1	1	2	4	5	0.090	249902	552.85	250144	558.57	250485	580.50	250727	586.49
1	1	2	4	5	0.120	249913	552.85	250155	558.57	250496	580.50	250738	586.49
1	1	2	4	5	0.190	264446	552.85	264490	558.57	264534	580.50	264578	586.49
1	1	2	4	5	0.250	264457	552.85	264501	558.57	264545	580.50	264589	586.49

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

FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.02	-0.001, -0.004	+0.01, -0.01
5/8" - 1"	+0.00, -0.03	-0.001, -0.004	+0.01, -0.01

# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

LONG LENGTH - 5 FLUTE -  CORNER RADIUS



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO						ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	60.81	-	-	250991	66.89	-	-	
1/4	1/4	1-1/8	3	5	0.030	250760	60.81	-	-	251002	66.89	-	-	
5/16	5/16	1-1/8	3	5	0.015	250771	82.84	-	-	251013	91.12	-	-	
5/16	5/16	1-1/8	3	5	0.030	250782	82.84	-	-	251024	91.12	-	-	
3/8	3/8	1-1/4	3	5	0.030	250793	109.63	-	-	251035	120.60	-	-	
3/8	3/8	1-1/4	3	5	0.060	250804	109.63	-	-	251046	120.60	-	-	
1/2	1/2	2	4	5	0.030	250815	170.08	250903	175.79	251057	187.09	251145	193.37	
1/2	1/2	2	4	5	0.060	250826	170.08	250914	175.79	251068	187.09	251156	193.37	
5/8	5/8	2-1/4	5	5	0.030	250837	308.16	250925	313.88	251079	323.57	251167	329.57	
5/8	5/8	2-1/4	5	5	0.060	250848	308.16	250936	313.88	251090	323.57	251178	329.57	
3/4	3/4	2-1/4	5	5	0.030	250859	388.06	250947	395.49	251101	407.46	251189	415.26	
3/4	3/4	2-1/4	5	5	0.060	250870	388.06	250958	395.49	251112	407.46	251200	415.26	
1	1	2-1/4	5	5	0.030	250881	605.13	250969	610.84	251123	635.38	251211	641.38	
1	1	2-1/4	5	5	0.060	250892	605.13	250980	610.84	251134	635.38	251222	641.38	



FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.02	-0.0001, -0.0004	+0.01, -0.01
5/8" - 1"	+0.00, -0.03	-0.0001, -0.0004	+0.01, -0.01

# Carbide Endmills

HIGH PERFORMANCE

## VI-PRO

VARIABLE INDEX

EXTRA LONG LENGTH - 5 FLUTE -  CORNER RADIUS



AVAILABLE WITH ALTIN OR ALCRO-MAX COATING

SIZE	VI-PRO					ALTIN COATED				ALCRO-MAX COATED			
	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	CORNER 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	74.00	-	-	251541	81.41	-	-
1/4	1/4	1-1/2	4	5	0.030	251244	74.00	-	-	251552	81.41	-	-
3/8	3/8	2	4	5	0.030	251255	125.34	-	-	251563	137.88	-	-
3/8	3/8	2	4	5	0.060	251266	125.34	-	-	251574	137.88	-	-
1/2	1/2	3	6	5	0.030	251277	233.61	251409	239.32	251585	256.97	251717	263.25
1/2	1/2	3	6	5	0.060	251288	233.61	251420	239.32	251596	256.97	251728	263.25
5/8	5/8	3	6	5	0.030	251299	329.19	251431	334.90	251607	345.65	251739	351.64
5/8	5/8	3	6	5	0.060	251310	329.19	251442	334.90	251618	345.65	251750	351.64
3/4	3/4	3	6	5	0.030	251321	434.65	251453	440.36	251629	456.38	251761	462.38
3/4	3/4	3	6	5	0.060	251332	434.65	251464	440.36	251640	456.38	251772	462.38
3/4	3/4	4	7	5	0.030	251343	707.68	251475	713.39	251651	743.06	251783	749.06
3/4	3/4	4	7	5	0.060	251354	707.68	251486	713.39	251662	743.06	251794	749.06
1	1	3	6	5	0.030	251365	711.45	251497	717.16	251673	747.02	251805	753.02
1	1	3	6	5	0.060	251376	711.45	251508	717.16	251684	747.02	251816	753.02
1	1	4-1/4	7	5	0.030	251387	1,033.06	251519	1,039.18	251695	1,082.85	251827	1,089.54
1	1	4-1/4	7	5	0.060	251398	1,033.06	251530	1,039.18	251706	1,082.85	251838	1,089.54



FOR VI PRO TECHNICAL AND COATING INFORMATION, PLEASE SEE PAGES 191, 194-195.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/4" - 1/2"	+0.00, -0.002	-0.0001, -0.0004	+0.001, -0.001
5/8" - 1"	+0.00, -0.003	-0.0001, -0.0004	+0.001, -0.001

# Carbide Endmills

HIGH PERFORMANCE

## 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	88.10	-	-	252267	96.90	-	-
5/16	5/16	13/16	2-1/2	6	148652	104.63	-	-	252278	115.10	-	-
3/8	3/8	1	2-1/2	6	148663	112.76	-	-	252289	124.04	-	-
1/2	1/2	1-1/4	3	6	148685	150.76	251849	158.29	252300	165.83	252344	174.12
5/8	5/8	1-5/8	3-1/2	6	148696	251.24	251860	258.77	252311	263.79	252355	271.71
3/4	3/4	1-5/8	4	6	148707	315.37	251871	324.82	252322	331.12	252366	341.06
1	1	2	4	6	148718	483.02	251882	492.67	252333	507.16	252377	517.31

REGULAR LENGTH - 6 FLUTE -  CORNER RADIUS - 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	CORNER 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	.015	148729	98.34	-	-	252388	108.18	-	-
5/16	5/16	13/16	2-1/2	6	.015	148740	116.84	-	-	252399	128.51	-	-
3/8	3/8	1	2-1/2	6	.015	148751	125.93	-	-	252410	138.50	-	-
1/2	1/2	1-1/4	3	6	.030	148773	168.33	251893	176.73	252421	185.15	252465	194.41
5/8	5/8	1-5/8	3-1/2	6	.030	148784	268.31	251904	276.35	252432	281.72	252476	290.17
3/4	3/4	1-5/8	4	6	.060	148795	336.80	251915	346.90	252443	353.63	252487	364.24
1	1	2	4	6	.060	148806	515.83	251926	531.31	252454	541.63	252498	557.87

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

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+ .000, -.002	-.0001, -.0004	+ .001, -.001



# Carbide Endmills

HIGH PERFORMANCE

## Terminator

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	97.12	-	-	252146	106.85	-	-
5/16	5/16	1-1/8	3	6	148828	113.33	-	-	252157	124.65	-	-
3/8	3/8	1-1/4	3	6	148839	128.79	-	-	252168	141.68	-	-
1/2	1/2	2	4	6	148861	200.32	251937	210.33	252179	220.34	252223	231.36
5/8	5/8	2-1/4	5	6	148872	311.18	251948	320.53	252190	326.75	252234	336.55
3/4	3/4	2-1/4	5	6	148883	388.62	251959	400.28	252201	408.05	252245	420.29
1	1	3	6	6	148894	787.65	251970	803.40	252212	827.03	252256	843.57

LONG LENGTH - 6 FLUTE -  CORNER RADIUS - 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	CORNER 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	6	.015	148905	108.46	-	-	252025	119.29	-	-
5/16	5/16	1-1/8	3	6	.015	148916	126.53	-	-	252036	139.17	-	-
3/8	3/8	1-1/4	3	6	.015	148927	143.82	-	-	252047	158.19	-	-
1/2	1/2	2	4	6	.030	148949	223.65	251981	234.82	252058	246.00	252102	258.30
5/8	5/8	2-1/4	5	6	.030	148960	332.33	251992	342.32	252069	348.96	252113	359.43
3/4	3/4	2-1/4	5	6	.060	148971	415.03	252003	427.49	252080	435.79	252124	448.87
1	1	3	6	6	.060	148982	841.15	252014	857.99	252091	883.23	252135	900.89

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

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.000, -.002	-.0001, -.0004	+0.001, -.001

# Carbide Endmills

**HIGH PERFORMANCE**

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



**UNCOATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/8	2	4	257261	44.69
5/16	5/16	1/2	2	4	257272	61.55
3/8	3/8	9/16	2	4	257283	71.79
1/2	1/2	5/8	2-1/2	4	257294	91.47
5/8	5/8	3/4	3	4	257305	193.87
3/4	3/4	1	3	4	257316	237.12

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

**HARDENED STEELS ■ TITANIUM ■ INCONEL ■ SPACE AGE MATERIALS**



FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

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

# Carbide Endmills

HIGH PERFORMANCE

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



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/8	2	4	257921	54.79
5/16	5/16	1/2	2	4	257932	76.94
3/8	3/8	9/16	2	4	257943	89.75
1/2	1/2	5/8	2-1/2	4	257954	112.17
5/8	5/8	3/4	3	4	257965	242.33
3/4	3/4	1	3	4	257976	290.83



ALCRO-MAX COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/8	2	4	262312	60.28
5/16	5/16	1/2	2	4	262323	84.64
3/8	3/8	9/16	2	4	262334	98.72
1/2	1/2	5/8	2-1/2	4	262345	123.38
5/8	5/8	3/4	3	4	262356	266.56
3/4	3/4	1	3	4	262367	319.92

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

**HARDENED STEELS ■ TITANIUM ■ INCONEL ■ SPACE AGE MATERIALS**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

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

# Carbide Endmills

**HIGH PERFORMANCE**

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



**UNCOATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	142756	49.66
5/16	5/16	13/16	2-1/2	4	142767	68.39
3/8	3/8	7/8	2-1/2	4	142778	79.77
1/2	1/2	1-1/4	3	4	142789	101.64
5/8	5/8	1-5/8	3-1/2	4	142800	215.41
3/4	3/4	1-5/8	4	4	142811	263.46
1	1	2	4	4	142822	489.26



**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	142833	61.46
5/16	5/16	13/16	2-1/2	4	142844	85.49
3/8	3/8	7/8	2-1/2	4	142855	99.72
1/2	1/2	1-1/4	3	4	142866	125.83
5/8	5/8	1-5/8	3-1/2	4	142877	269.24
3/4	3/4	1-5/8	4	4	142888	326.22
1	1	2	4	4	142899	600.01



**ALCRO-MAX COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	262444	67.61
5/16	5/16	13/16	2-1/2	4	262455	94.04
3/8	3/8	7/8	2-1/2	4	262466	109.68
1/2	1/2	1-1/4	3	4	262477	138.41
5/8	5/8	1-5/8	3-1/2	4	262488	296.17
3/4	3/4	1-5/8	4	4	262499	358.84
1	1	2	4	4	262510	660.17

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

**HARDENED STEELS ■ TITANIUM ■ INCONEL ■ SPACE AGE MATERIALS**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

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 Endmills

HIGH PERFORMANCE

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



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	217281	70.39
5/16	5/16	1-1/2	4	4	217292	90.27
3/8	3/8	1-3/4	4	4	217303	112.85
1/2	1/2	2	4	4	217314	130.33
5/8	5/8	2-1/2	5	4	217325	305.42
3/4	3/4	2-1/2	5	4	217336	367.54
1	1	2-1/2	5	4	217347	627.87



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	218645	88.01
5/16	5/16	1-1/2	4	4	218656	112.85
3/8	3/8	1-3/4	4	4	218667	141.08
1/2	1/2	2	4	4	218678	163.05
5/8	5/8	2-1/2	5	4	218689	383.58
3/4	3/4	2-1/2	5	4	218700	460.72
1	1	2-1/2	5	4	218711	786.16



ALCro-MAX COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	262378	96.82
5/16	5/16	1-1/2	4	4	262389	124.14
3/8	3/8	1-3/4	4	4	262400	155.19
1/2	1/2	2	4	4	262411	179.24
5/8	5/8	2-1/2	5	4	262422	421.94
3/4	3/4	2-1/2	5	4	262433	506.79
1	1	2-1/2	5	4	262436	864.78

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

**HARDENED STEELS ■ TITANIUM ■ INCONEL ■ SPACE AGE MATERIALS**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

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 Endmills

**HIGH PERFORMANCE**

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



**UNCOATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	261905	64.35
5/16	5/16	7/8	2-1/2	4	261916	82.50
3/8	3/8	1	2-1/2	4	261927	105.60
1/2	1/2	1-1/4	3	4	261938	145.20
5/8	5/8	1-5/8	3-1/2	4	261949	253.00
3/4	3/4	1-5/8	4	4	261960	353.10
1	1	2	4	4	261971	577.50



**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	262158	77.00
5/16	5/16	7/8	2-1/2	4	262169	99.00
3/8	3/8	1	2-1/2	4	262180	126.50
1/2	1/2	1-1/4	3	4	262191	173.80
5/8	5/8	1-5/8	3-1/2	4	262202	303.60
3/4	3/4	1-5/8	4	4	262213	423.50
1	1	2	4	4	262224	687.50



**ALCRO-MAX COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	262235	84.70
5/16	5/16	7/8	2-1/2	4	262246	108.90
3/8	3/8	1	2-1/2	4	262257	139.15
1/2	1/2	1-1/4	3	4	262268	191.40
5/8	5/8	1-5/8	3-1/2	4	262279	333.30
3/4	3/4	1-5/8	4	4	262290	465.30
1	1	2	4	4	262301	748.00

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

**HARDENED STEELS ■ TITANIUM ■ INCONEL ■ SPACE AGE MATERIALS**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

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 Endmills

HIGH PERFORMANCE

ROUGHER / FINISHER - REGULAR LENGTH - 4 FLUTE -  CORNER RADIUS - 40° HELIX



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	0.020	142910	85.16
5/16	5/16	13/16	2-1/2	4	0.020	142921	92.24
3/8	3/8	7/8	2-1/2	4	0.020	142932	100.23
1/2	1/2	1-1/4	3	4	0.040	142943	115.84
5/8*	5/8	1-5/8	3-1/2	4	0.040	142954	230.69
3/4*	3/4	1-5/8	4	4	0.040	142965	308.19
1*	1	1-5/8	4	4	0.040	142976	502.96

\* WITH WELDON FLATS



ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	0.020	142987	106.46
5/16	5/16	13/16	2-1/2	4	0.020	142998	115.29
3/8	3/8	7/8	2-1/2	4	0.020	143009	125.28
1/2	1/2	1-1/4	3	4	0.040	143020	144.83
5/8*	5/8	1-5/8	3-1/2	4	0.040	143031	288.35
3/4*	3/4	1-5/8	4	4	0.040	143042	385.26
1*	1	1-5/8	4	4	0.040	143053	628.72

\* 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.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGE 198.

TOLERANCES	DIAMETER	SHANK	RADIUS
ALL SIZES	+0.00, -.002	-.0001, -.0004	+.002, -.002

# Carbide Endmills

**HIGH PERFORMANCE**

HP 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	22.87
3/16	3/16	5/8	2	3	143075	27.38
1/4	1/4	3/4	2-1/2	3	143086	29.34
5/16	5/16	13/16	2-1/2	3	143097	35.50
3/8	3/8	1	2-1/2	3	143108	47.52
1/2	1/2	1-1/4	3	3	143119	81.05
5/8	5/8	1-5/8	3-1/2	3	143130	161.35
3/4	3/4	1-5/8	4	3	143141	226.44

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143240	28.56
3/16	3/16	5/8	2	3	143251	34.21
1/4	1/4	3/4	2-1/2	3	143262	36.68
5/16	5/16	13/16	2-1/2	3	143273	44.37
3/8	3/8	1	2-1/2	3	143284	59.40
1/2	1/2	1-1/4	3	3	143295	101.34
5/8	5/8	1-5/8	3-1/2	3	143306	201.68
3/4	3/4	1-5/8	4	3	143317	283.02

## REGULAR LENGTH - 3 FLUTE - CORNER RADIUS - 60° 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	0.010	143152	25.51
3/16	3/16	5/8	2	3	0.010	143163	30.56
1/4	1/4	3/4	2-1/2	3	0.020	143174	32.78
5/16	5/16	13/16	2-1/2	3	0.020	143185	39.61
3/8	3/8	1	2-1/2	3	0.020	143196	53.07
1/2	1/2	1-1/4	3	3	0.040	143207	90.50
5/8	5/8	1-5/8	3-1/2	3	0.040	143218	172.30
3/4	3/4	1-5/8	4	3	0.040	143229	241.80

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	0.010	143328	31.88
3/16	3/16	5/8	2	3	0.010	143339	38.18
1/4	1/4	3/4	2-1/2	3	0.020	143350	40.94
5/16	5/16	13/16	2-1/2	3	0.020	143361	49.53
3/8	3/8	1	2-1/2	3	0.020	143372	66.34
1/2	1/2	1-1/4	3	3	0.040	143383	113.12
5/8	5/8	1-5/8	3-1/2	3	0.040	143394	215.39
3/4	3/4	1-5/8	4	3	0.040	143405	302.27

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

**Works well in all high temperature alloys such as inconels, hastalloy, waspalloys and titanium.**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.02	-0.0001, -0.0004	+0.01, -0.01
5/8" - 3/4"	+0.00, -0.03	-0.0001, -0.0004	+0.01, -0.01



# Carbide Endmills

HIGH PERFORMANCE

## 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	22.87
3/16	3/16	5/8	2	3	143427	27.38
1/4	1/4	3/4	2-1/2	3	143438	29.34
5/16	5/16	13/16	2-1/2	3	143449	35.50
3/8	3/8	1	2-1/2	3	143460	47.52
1/2	1/2	1-1/4	3	3	143471	81.05
5/8	5/8	1-5/8	3-1/2	3	143482	161.35
3/4	3/4	1-5/8	4	3	143493	226.44

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143592	28.56
3/16	3/16	5/8	2	3	143603	34.21
1/4	1/4	3/4	2-1/2	3	143614	36.68
5/16	5/16	13/16	2-1/2	3	143625	44.37
3/8	3/8	1	2-1/2	3	143636	59.40
1/2	1/2	1-1/4	3	3	143647	101.34
5/8	5/8	1-5/8	3-1/2	3	143658	201.68
3/4	3/4	1-5/8	4	3	143669	283.02

## REGULAR LENGTH - 3 FLUTE - CORNER RADIUS - 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	0.010	143504	25.51
3/16	3/16	5/8	2	3	0.010	143515	30.56
1/4	1/4	3/4	2-1/2	3	0.020	143526	32.78
5/16	5/16	13/16	2-1/2	3	0.020	143537	39.61
3/8	3/8	1	2-1/2	3	0.020	143548	53.07
1/2	1/2	1-1/4	3	3	0.040	143559	90.50
5/8	5/8	1-5/8	3-1/2	3	0.040	143570	172.30
3/4	3/4	1-5/8	4	3	0.040	143581	241.80

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	0.010	143680	31.88
3/16	3/16	5/8	2	3	0.010	143691	38.18
1/4	1/4	3/4	2-1/2	3	0.020	143702	40.94
5/16	5/16	13/16	2-1/2	3	0.020	143713	49.53
3/8	3/8	1	2-1/2	3	0.020	143724	66.34
1/2	1/2	1-1/4	3	3	0.040	143735	113.12
5/8	5/8	1-5/8	3-1/2	3	0.040	143746	215.39
3/4	3/4	1-5/8	4	3	0.040	143757	302.27

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

Works well in stainless steel and other similar alloys

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

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

# Carbide Endmills

**HIGH PERFORMANCE**

HP 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	11.20
3/16	3/16	3/8	2	5	149004	19.61
1/4	1/4	1/2	2	5	149015	23.65
5/16	5/16	1/2	2	5	149026	28.41
3/8	3/8	5/8	2	5	149037	46.73
7/16	7/16	5/8	2-1/2	5	149048	53.43
1/2	1/2	5/8	2-1/2	5	149059	61.69
5/8	5/8	3/4	3	5	149070	109.57
3/4	3/4	1	3	5	149081	147.65

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	149092	14.13
3/16	3/16	3/8	2	5	149103	23.47
1/4	1/4	1/2	2	5	149114	28.09
5/16	5/16	1/2	2	5	149125	35.50
3/8	3/8	5/8	2	5	149136	55.61
7/16	7/16	5/8	2-1/2	5	149147	63.59
1/2	1/2	5/8	2-1/2	5	149158	73.50
5/8	5/8	3/4	3	5	149169	132.65
3/4	3/4	1	3	5	149180	182.25

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	0.010	149191	12.49
3/16	3/16	3/8	2	5	0.010	149202	21.90
1/4	1/4	1/2	2	5	0.020	149213	26.41
5/16	5/16	1/2	2	5	0.020	149224	31.71
3/8	3/8	5/8	2	5	0.020	149235	52.17
7/16	7/16	5/8	2-1/2	5	0.020	149246	59.65
1/2	1/2	5/8	2-1/2	5	0.040	149257	68.89
5/8	5/8	3/4	3	5	0.040	149268	117.02
3/4	3/4	1	3	5	0.040	149279	157.67

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	0.010	149290	15.78
3/16	3/16	3/8	2	5	0.010	149301	26.23
1/4	1/4	1/2	2	5	0.020	149312	31.38
5/16	5/16	1/2	2	5	0.020	149323	39.61
3/8	3/8	5/8	2	5	0.020	149334	62.09
7/16	7/16	5/8	2-1/2	5	0.020	149345	71.03
1/2	1/2	5/8	2-1/2	5	0.040	149356	82.05
5/8	5/8	3/4	3	5	0.040	149367	141.64
3/4	3/4	1	3	5	0.040	149378	194.63

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

Works well in all exotic materials, stainless steel, carbon steels and other similar materials.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.002	-0.0001, -0.0004	+0.001, -0.001
5/8" - 3/4"	+0.00, -0.003	-0.0001, -0.0004	+0.001, -0.001

# Carbide Endmills

HIGH PERFORMANCE

## 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	23.83
3/16	3/16	3/4	2	5	149400	29.99
1/4	1/4	3/4	2-1/2	5	149411	32.28
5/16	5/16	7/8	2-1/2	5	149422	38.97
3/8	3/8	1	2-1/2	5	149433	52.14
1/2	1/2	1-1/4	3	5	149444	97.33
5/8	5/8	1-5/8	3-1/2	5	149455	184.54
3/4	3/4	1-5/8	4	5	149466	259.51

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	149477	29.81
3/16	3/16	3/4	2	5	149488	35.75
1/4	1/4	3/4	2-1/2	5	149499	38.47
5/16	5/16	7/8	2-1/2	5	149510	46.31
3/8	3/8	1	2-1/2	5	149521	62.12
1/2	1/2	1-1/4	3	5	149532	121.09
5/8	5/8	1-5/8	3-1/2	5	149543	234.14
3/4	3/4	1-5/8	4	5	149554	318.34

## REGULAR LENGTH - 5 FLUTE - CORNER RADIUS - 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	5	0.010	150181	26.62
3/16	3/16	3/4	2	5	0.010	150192	33.49
1/4	1/4	3/4	2-1/2	5	0.020	150203	36.07
5/16	5/16	7/8	2-1/2	5	0.020	150214	43.48
3/8	3/8	1	2-1/2	5	0.020	150225	58.22
1/2	1/2	1-1/4	3	5	0.040	150236	108.68
5/8	5/8	1-5/8	3-1/2	5	0.040	150247	197.10
3/4	3/4	1-5/8	4	5	0.040	150258	277.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	0.010	150269	33.28
3/16	3/16	3/4	2	5	0.010	150280	39.90
1/4	1/4	3/4	2-1/2	5	0.020	150291	42.91
5/16	5/16	7/8	2-1/2	5	0.020	150302	51.71
3/8	3/8	1	2-1/2	5	0.020	150313	69.35
1/2	1/2	1-1/4	3	5	0.040	150324	135.19
5/8	5/8	1-5/8	3-1/2	5	0.040	150335	250.06
3/4	3/4	1-5/8	4	5	0.040	150346	339.95

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

Works well in all exotic materials, stainless steel, carbon steels and other similar materials.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

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

# Carbide Endmills

**HIGH PERFORMANCE**

HP CARBIDE ENDMILLS

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



**UNCOATED**



**ZRN 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	22.44
3/16	3/16	5/8	2	2	148562	31.28
1/4	1/4	3/4	2-1/2	2	149565	45.12
5/16	5/16	13/16	2-1/2	2	149576	53.28
3/8	3/8	1	2-1/2	2	149587	56.43
1/2	1/2	1-1/4	3	2	149598	93.40
5/8	5/8	1-5/8	3-1/2	2	149609	178.64
3/4	3/4	1-3/4	4	2	149620	256.04
1	1	1-3/4	4	2	149631	422.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	149638	28.06
3/16	3/16	5/8	2	2	149640	39.11
1/4	1/4	3/4	2-1/2	2	149642	54.57
5/16	5/16	13/16	2-1/2	2	149653	64.45
3/8	3/8	1	2-1/2	2	149664	68.21
1/2	1/2	1-1/4	3	2	149675	108.32
5/8	5/8	1-5/8	3-1/2	2	149686	216.50
3/4	3/4	1-3/4	4	2	149697	310.93
1	1	1-3/4	4	2	149708	511.83

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



**UNCOATED**



**ZRN 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	2	0.020	150351	26.80
3/16	3/16	5/8	2	2	0.020	150353	36.79
1/4	1/4	3/4	2-1/2	2	0.020	150357	50.38
5/16	5/16	13/16	2-1/2	2	0.020	150368	59.51
3/8	3/8	1	2-1/2	2	0.020	150379	63.02
1/2	1/2	1-1/4	3	2	0.040	150390	104.28
5/8	5/8	1-5/8	3-1/2	2	0.040	150401	190.77
3/4	3/4	1-3/4	4	2	0.040	150412	273.47
1	1	1-3/4	4	2	0.040	150423	450.85

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	0.020	150430	33.53
3/16	3/16	5/8	2	2	0.020	150432	45.98
1/4	1/4	3/4	2-1/2	2	0.020	150434	60.91
5/16	5/16	13/16	2-1/2	2	0.020	150445	71.96
3/8	3/8	1	2-1/2	2	0.020	150456	76.15
1/2	1/2	1-1/4	3	2	0.040	150467	120.92
5/8	5/8	1-5/8	3-1/2	2	0.040	150478	231.20
3/4	3/4	1-3/4	4	2	0.040	150489	332.08
1	1	1-3/4	4	2	0.040	150500	546.61

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

Works well in all non-ferrous materials as well as brass and bronze applications

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

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



# Carbide Endmills

HIGH PERFORMANCE

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



UNCOATED



ZRN 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	38.11
3/16	3/16	3/4	2-1/2	2	149871	43.94
1/4	1/4	1-1/4	3	2	149873	61.94
5/16	5/16	1-3/8	3	2	149884	80.19
3/8	3/8	1-1/2	4	2	149895	100.45
1/2	1/2	2	4	2	149906	140.74
5/8	5/8	2-3/8	5	2	149917	291.82
3/4	3/4	2-1/2	5	2	149928	320.67
1	1	2-1/4	5	2	149939	527.11

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	149946	47.63
3/16	3/16	3/4	2-1/2	2	149948	54.93
1/4	1/4	1-1/4	3	2	149950	74.86
5/16	5/16	1-3/8	3	2	149961	101.84
3/8	3/8	1-1/2	4	2	149972	121.49
1/2	1/2	2	4	2	149983	170.66
5/8	5/8	2-3/8	5	2	149994	371.41
3/4	3/4	2-1/2	5	2	150005	401.40
1	1	2-1/4	5	2	150016	632.06

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



UNCOATED



ZRN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	0.020	150507	45.70
3/16	3/16	3/4	2-1/2	2	0.020	150509	52.71
1/4	1/4	1-1/4	3	2	0.020	150511	69.17
5/16	5/16	1-3/8	3	2	0.020	150522	89.53
3/8	3/8	1-1/2	4	2	0.020	150533	112.15
1/2	1/2	2	4	2	0.040	150544	157.09
5/8	5/8	2-3/8	5	2	0.040	150555	311.65
3/4	3/4	2-1/2	5	2	0.040	150566	342.42
1	1	2-1/4	5	2	0.040	150577	562.96

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	0.020	150584	57.15
3/16	3/16	3/4	2-1/2	2	0.020	150586	65.92
1/4	1/4	1-1/4	3	2	0.020	150588	83.59
5/16	5/16	1-3/8	3	2	0.020	150599	113.69
3/8	3/8	1-1/2	4	2	0.020	150610	135.66
1/2	1/2	2	4	2	0.040	150621	190.55
5/8	5/8	2-3/8	5	2	0.040	150632	396.64
3/4	3/4	2-1/2	5	2	0.040	150643	428.66
1	1	2-1/4	5	2	0.040	150654	675.04

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

Works well in all non-ferrous materials as well as brass and bronze applications

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -0.002	-0.0001, -0.0004	+0.001, -0.001
5/8" - 1"	+0.00, -0.003	-0.0001, -0.0004	+0.001, -0.001

# Carbide Endmills

**HIGH PERFORMANCE**

HP CARBIDE ENDMILLS

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



**UNCOATED**



**ZRN 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	22.44
3/16	3/16	5/8	2	3	149717	31.28
1/4	1/4	3/4	2-1/2	3	149719	45.12
5/16	5/16	13/16	2-1/2	3	149730	53.28
3/8	3/8	1	2-1/2	3	149741	56.43
1/2	1/2	1-1/4	3	3	149752	93.40
5/8	5/8	1-5/8	3-1/2	3	149763	178.64
3/4	3/4	1-3/4	4	3	149774	256.04
1	1	1-3/4	4	3	149785	422.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	149792	28.06
3/16	3/16	5/8	2	3	149794	39.11
1/4	1/4	3/4	2-1/2	3	149796	54.57
5/16	5/16	13/16	2-1/2	3	149807	64.45
3/8	3/8	1	2-1/2	3	149818	68.21
1/2	1/2	1-1/4	3	3	149829	108.32
5/8	5/8	1-5/8	3-1/2	3	149840	216.50
3/4	3/4	1-3/4	4	3	149851	310.93
1	1	1-3/4	4	3	149862	511.83

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



**UNCOATED**



**ZRN 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	0.020	150661	26.80
3/16	3/16	5/8	2	3	0.020	150663	36.79
1/4	1/4	3/4	2-1/2	3	0.020	150665	50.38
5/16	5/16	13/16	2-1/2	3	0.020	150676	59.51
3/8	3/8	1	2-1/2	3	0.020	150687	63.02
1/2	1/2	1-1/4	3	3	0.040	150698	104.28
5/8	5/8	1-5/8	3-1/2	3	0.040	150709	190.77
3/4	3/4	1-3/4	4	3	0.040	150720	273.47
1	1	1-3/4	4	3	0.040	150731	450.85

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	0.020	150738	33.53
3/16	3/16	5/8	2	3	0.020	150740	45.98
1/4	1/4	3/4	2-1/2	3	0.020	150742	60.91
5/16	5/16	13/16	2-1/2	3	0.020	150753	71.96
3/8	3/8	1	2-1/2	3	0.020	150764	76.15
1/2	1/2	1-1/4	3	3	0.040	150775	120.92
5/8	5/8	1-5/8	3-1/2	3	0.040	150786	231.20
3/4	3/4	1-3/4	4	3	0.040	150797	332.08
1	1	1-3/4	4	3	0.040	150808	546.61

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

Works well in all non-ferrous materials as well as brass and bronze applications

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

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

# Carbide Endmills

HIGH PERFORMANCE

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



UNCOATED



ZRN 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	38.11
3/16	3/16	3/4	2-1/2	3	150025	43.94
1/4	1/4	1-1/4	3	3	150027	61.94
5/16	5/16	1-3/8	3	3	150038	80.19
3/8	3/8	1-1/2	4	3	150049	100.45
1/2	1/2	2	4	3	150060	140.74
5/8	5/8	2-3/8	5	3	150071	291.82
3/4	3/4	2-1/2	5	3	150082	320.67
1	1	2-1/4	5	3	150093	527.11

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	150100	47.52
3/16	3/16	3/4	2-1/2	3	150102	54.93
1/4	1/4	1-1/4	3	3	150104	74.86
5/16	5/16	1-3/8	3	3	150115	101.84
3/8	3/8	1-1/2	4	3	150126	121.49
1/2	1/2	2	4	3	150137	170.66
5/8	5/8	2-3/8	5	3	150148	371.41
3/4	3/4	2-1/2	5	3	150159	401.40
1	1	2-1/4	5	3	150170	632.06

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



UNCOATED



ZRN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	0.020	150815	45.70
3/16	3/16	3/4	2-1/2	3	0.020	150817	52.71
1/4	1/4	1-1/4	3	3	0.020	150819	69.17
5/16	5/16	1-3/8	3	3	0.020	150830	89.53
3/8	3/8	1-1/2	4	3	0.020	150841	112.15
1/2	1/2	2	4	3	0.040	150852	157.09
5/8	5/8	2-3/8	5	3	0.040	150863	311.65
3/4	3/4	2-1/2	5	3	0.040	150874	342.42
1	1	2-1/4	5	3	0.040	150885	562.96

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	0.020	150892	57.15
3/16	3/16	3/4	2-1/2	3	0.020	150894	65.92
1/4	1/4	1-1/4	3	3	0.020	150896	83.59
5/16	5/16	1-3/8	3	3	0.020	150907	113.69
3/8	3/8	1-1/2	4	3	0.020	150918	135.66
1/2	1/2	2	4	3	0.040	150929	190.55
5/8	5/8	2-3/8	5	3	0.040	150940	396.64
3/4	3/4	2-1/2	5	3	0.040	150951	428.66
1	1	2-1/4	5	3	0.040	150962	675.04

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

Works well in all non-ferrous materials as well as brass and bronze applications

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION, PLEASE SEE PAGES 196-197.

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

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

UNCOATED



ALTiN COATED



TiCN COATED



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	130711	25.13	166329	33.67	163854	33.67
1/32	1/8	1/8	1-1/2	130722	16.83	166340	22.75	163865	22.75
3/64	1/8	1/8	1-1/2	130733	14.39	166351	19.39	163876	19.39
1/16	1/8	1/4	1-1/2	130744	14.35	166362	16.48	163887	16.48
5/64	1/8	1/4	1-1/2	130755	14.81	166373	19.99	163898	19.99
3/32	1/8	3/8	1-1/2	130766	13.04	166384	16.48	163909	16.48
7/64	1/8	3/8	1-1/2	130777	13.61	166395	18.36	163920	18.36
1/8	1/8	1/2	1-1/2	130788	12.51	166406	15.31	163931	15.31
9/64	3/16	9/16	2	130799	18.32	166417	24.74	163942	24.74
5/32	3/16	9/16	2	130810	18.43	166428	21.37	163953	21.37
11/64	3/16	5/8	2	130821	17.51	166439	23.67	163964	23.67
3/16	3/16	5/8	2	130832	17.05	166450	21.37	163975	21.37
13/64	1/4	5/8	2-1/2	130843	24.88	166461	32.61	163986	32.61
7/32	1/4	5/8	2-1/2	130854	25.41	166472	29.52	163997	29.52
15/64	1/4	3/4	2-1/2	130865	28.71	166483	37.00	164008	37.00
1/4	1/4	3/4	2-1/2	130876	21.05	166494	29.52	164019	29.52
17/64	5/16	3/4	2-1/2	130887	37.96	166505	48.77	164030	48.77
9/32	5/16	3/4	2-1/2	130898	37.96	166516	48.77	164041	48.77
19/64	5/16	13/16	2-1/2	130909	37.96	166527	48.77	164052	48.77
5/16	5/16	13/16	2-1/2	130920	27.40	166538	35.33	164063	35.33
21/64	3/8	1	2-1/2	130931	42.56	166549	54.72	164074	54.72
11/32	3/8	1	2-1/2	130942	42.56	166560	54.72	164085	54.72
23/64	3/8	1	2-1/2	130953	42.56	166571	54.72	164096	54.72
3/8	3/8	1	2-1/2	130964	32.68	166582	40.40	164107	40.40
25/64	7/16	1	2-3/4	130975	55.71	166593	71.91	164118	71.91
13/32	7/16	1	2-3/4	130986	55.71	166604	71.91	164129	71.91
27/64	7/16	1	2-3/4	130997	57.52	166615	74.28	164140	74.28
7/16	7/16	1	2-3/4	131008	50.15	166626	61.74	164151	61.74
29/64	1/2	1	3	131019	82.79	166637	105.97	164162	105.97
15/32	1/2	1	3	131030	82.79	166648	105.97	164173	105.97
31/64	1/2	1	3	131041	82.79	166659	105.97	164184	105.97
1/2	1/2	1	3	131052	60.21	166670	75.13	164195	75.13
1/2	1/2	1-1/4	3	131063	60.21	166681	75.13	164206	75.13
9/16	9/16	1-1/4	3-1/2	131074	113.80	166692	150.27	164217	150.27
5/8	5/8	1-1/4	3-1/2	131085	115.11	166703	146.76	164228	146.76
3/4	3/4	1-1/2	4	131096	161.68	166714	208.25	164239	208.25
7/8	7/8	1-1/2	4	131107	295.72	166725	374.29	164250	374.29
1	1	1-1/2	4	131118	272.20	166736	348.17	164261	348.17
1-1/4	1-1/4	2	4-1/2	131129	929.43	166747	1,056.16	164272	1,056.16

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

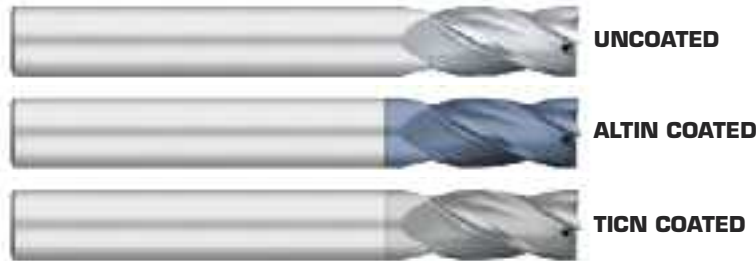
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -.0004
1/8" - 1/2"	+0.00, -0.002	-0.001, -.0004
9/16" - 1-1/4"	+0.00, -0.003	-0.001, -.0004

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136442	20.20	136596	25.98	165251	25.98
3/16	3/16	3/4	2-1/2	136453	23.71	136607	30.48	165262	30.48
1/4	1/4	1-1/8	3	136464	33.95	136618	43.77	165273	43.77
1/4	1/4	1	4	136475	35.76	136629	46.11	165284	46.11
5/16	5/16	1-1/8	3	136486	38.31	136640	51.71	165295	51.71
3/8	3/8	1-1/8	3	136497	43.95	136651	59.33	165306	59.33
3/8	3/8	1	4	136508	51.32	136662	66.03	165317	66.03
7/16	7/16	2	4	136519	69.25	136673	90.05	165328	90.05
1/2	1/2	1	4	136530	77.18	136684	99.39	165339	99.39
1/2	1/2	2	4	136541	81.74	136695	104.90	165350	104.90
5/8	5/8	2-1/4	5	136552	177.52	136706	219.70	165361	219.70
3/4	3/4	2-1/4	5	136563	245.18	136717	296.80	165372	296.80
7/8	7/8	2-1/4	5	136574	464.70	136728	549.19	165383	549.19
1	1	2-1/4	5	136585	335.66	136739	433.22	165394	433.22

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137674	22.58	137850	30.48	165867	30.48
3/16	3/16	1-1/8	3	137685	24.56	137861	31.54	165878	31.54
1/4	1/4	1-1/2	4	137696	34.70	137872	44.69	165889	44.69
1/4	1/4	1-1/2	6	137707	46.92	137883	60.36	165900	60.36
5/16	5/16	1-5/8	4	137718	47.35	137894	61.10	165911	61.10
3/8	3/8	1-3/4	4	137729	53.76	137905	68.86	165922	68.86
3/8	3/8	1-1/2	6	137740	81.41	137916	104.94	165933	104.94
7/16	7/16	3	6	137751	109.65	137927	140.59	165944	140.59
1/2	1/2	1-1/2	6	137762	123.90	137938	153.78	165955	153.78
1/2	1/2	3	6	137773	130.07	137949	159.94	165966	159.94
5/8	5/8	3	6	137784	191.56	137960	235.50	165977	235.50
3/4	3/4	3	6	137795	284.69	137971	334.31	165988	334.31
3/4	3/4	4	7	137806	488.58	137982	553.87	165993	553.87
7/8	7/8	3	6	137817	506.94	137993	633.71	165999	633.71
1	1	3	6	137828	483.30	138004	539.53	166010	539.53
1	1	4	7	137839	633.57	138015	777.67	166013	777.67

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA



## REGULAR LENGTH - 4 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
1/64	1/8	1/32	1-1/2	132779	28.14	133186	37.71	164690	37.71
1/32	1/8	1/8	1-1/2	132790	18.00	133197	23.39	164701	23.39
3/64	1/8	1/8	1-1/2	132801	18.00	133208	23.39	164712	23.39
1/16	1/8	1/4	1-1/2	132812	16.69	133219	22.54	164723	22.54
5/64	1/8	1/4	1-1/2	132823	16.69	133230	22.54	164734	22.54
3/32	1/8	3/8	1-1/2	132834	17.51	133241	23.67	164745	23.67
7/64	1/8	3/8	1-1/2	132845	17.51	133252	23.67	164756	23.67
1/8	1/8	1/2	1-1/2	132856	16.05	133263	21.69	164767	21.69
9/64	3/16	9/16	2	132867	23.53	133274	31.79	164778	31.79
5/32	3/16	9/16	2	132878	23.53	133285	31.79	164789	31.79
11/64	3/16	5/8	2	132889	23.53	133296	31.79	164800	31.79
3/16	3/16	5/8	2	132900	21.16	133307	28.57	164811	28.57
13/64	1/4	5/8	2-1/2	132911	27.43	133318	38.88	164822	38.88
7/32	1/4	5/8	2-1/2	132922	27.43	133329	38.88	164833	38.88
15/64	1/4	3/4	2-1/2	132933	27.43	133340	38.88	164844	38.88
1/4	1/4	3/4	2-1/2	132944	28.74	133351	37.04	164855	37.04
17/64	5/16	3/4	2-1/2	132955	38.88	133362	50.01	164866	50.01
9/32	5/16	3/4	2-1/2	132966	38.95	133373	50.08	164877	50.08
19/64	5/16	13/16	2-1/2	132977	42.32	133384	55.54	164888	55.54
5/16	5/16	13/16	2-1/2	132988	35.83	133395	46.07	164899	46.07
21/64	3/8	1	2-1/2	132999	49.23	133406	66.45	164910	66.45
11/32	3/8	1	2-1/2	133010	51.67	133417	66.45	164921	66.45
23/64	3/8	1	2-1/2	133021	49.23	133428	66.45	164932	66.45
3/8	3/8	1	2-1/2	133032	38.35	133439	54.19	164943	54.19
25/64	7/16	1	2-3/4	133043	66.66	133450	85.91	164954	85.91
13/32	7/16	1	2-3/4	133054	66.66	133461	85.91	164965	85.91
27/64	7/16	1	2-3/4	133065	66.66	133472	85.91	164976	85.91
7/16	7/16	1	2-3/4	133076	56.74	133483	73.15	164987	73.15
29/64	1/2	1	3	133087	87.89	133494	113.34	164998	113.34
15/32	1/2	1	3	133098	87.89	133505	113.34	165009	113.34
31/64	1/2	1	3	133109	87.89	133516	113.34	165020	113.34
1/2	1/2	1	3	133120	77.83	133527	100.30	165031	100.30
9/16	9/16	1-1/4	3-1/2	133131	118.62	133538	145.98	165042	145.98
5/8	5/8	1-1/4	3-1/2	133142	125.85	133549	162.21	165053	162.21
3/4	3/4	1-1/2	4	133153	185.42	133560	241.63	165064	241.63
7/8	7/8	1-1/2	4	133164	359.08	133571	456.26	165075	456.26
1	1	1-1/2	4	133175	331.19	133582	426.77	165086	426.77

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

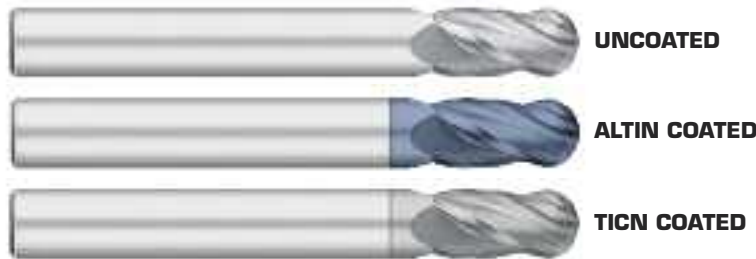
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.002	-0.001, -0.004
9/16" - 1"	+0.00, -0.003	-0.001, -0.004

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	24.03	137212	30.90	165559	30.90
3/16	3/16	3/4	2-1/2	137069	27.64	137223	35.51	165570	35.51
1/4	1/4	1-1/8	3	137080	38.88	137234	50.04	165581	50.04
1/4	1/4	1	4	137091	42.92	137245	55.32	165592	55.32
5/16	5/16	1-1/8	3	137102	45.72	137256	61.70	165603	61.70
3/8	3/8	1-1/8	3	137113	52.77	137267	71.27	165614	71.27
3/8	3/8	1	4	137124	64.64	137278	83.99	165625	83.99
7/16	7/16	2	4	137135	88.39	137289	114.93	165636	114.93
1/2	1/2	1	4	137146	90.52	137300	115.11	165647	115.11
1/2	1/2	2	4	137157	91.40	137311	116.00	165658	116.00
5/8	5/8	2-1/4	5	137168	208.25	137322	264.49	165669	264.49
3/4	3/4	2-1/4	5	137179	289.97	137333	367.31	165680	367.31
7/8	7/8	2-1/4	5	137190	498.51	137344	612.59	165691	612.59
1	1	2-1/4	5	137201	573.78	137355	705.62	165702	705.62

## 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	26.90	138510	36.29	166175	36.29
3/16	3/16	1-1/8	3	138345	29.45	138521	37.89	166186	37.89
1/4	1/4	1-1/2	4	138356	40.89	138532	52.59	166197	52.59
1/4	1/4	1-1/2	6	138367	52.38	138543	65.40	166208	65.40
5/16	5/16	1-5/8	4	138378	57.13	138554	73.75	166219	73.75
3/8	3/8	1-3/4	4	138389	61.49	138565	78.61	166230	78.61
3/8	3/8	1-1/2	6	138400	86.65	138576	108.09	166241	108.09
7/16	7/16	3	6	138411	130.07	138587	166.96	166252	166.96
1/2	1/2	1-1/2	6	138422	137.97	138598	176.64	166263	176.64
1/2	1/2	3	6	138433	138.82	138609	179.26	166274	179.26
5/8	5/8	3	6	138444	218.81	138620	268.89	166285	268.89
3/4	3/4	3	6	138455	310.28	138631	418.87	166296	418.87
3/4	3/4	4	7	138466	510.91	138642	646.15	166307	646.15
7/8	7/8	3	6	138477	549.19	138653	684.39	166318	684.39
1	1	3	6	138488	553.58	138664	712.71	166329	712.71
1	1	4	7	138499	669.58	138675	797.45	166340	797.45

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

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

UNCOATED



ALTiN COATED



TiCN COATED



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/64	1/8	1/32	1-1/2	129567	25.13	129974	33.67	163447	33.67
1/32	1/8	1/8	1-1/2	129578	16.83	129985	22.75	163458	22.75
3/64	1/8	1/8	1-1/2	129589	14.39	129996	19.39	163469	19.39
1/16	1/8	1/4	1-1/2	129600	14.35	130007	16.48	163480	16.48
5/64	1/8	1/4	1-1/2	129611	14.81	130018	19.99	163491	19.99
3/32	1/8	3/8	1-1/2	129622	13.04	130029	16.48	163502	16.48
7/64	1/8	3/8	1-1/2	129633	13.61	130040	18.36	163513	18.36
1/8	1/8	1/2	1-1/2	129644	12.51	130051	15.31	163524	15.31
9/64	3/16	9/16	2	129655	18.32	130062	24.74	163535	24.74
5/32	3/16	9/16	2	129666	18.43	130073	21.37	163546	21.37
11/64	3/16	5/8	2	129677	17.51	130084	23.67	163557	23.67
3/16	3/16	5/8	2	129688	17.05	130095	21.37	163568	21.37
13/64	1/4	5/8	2-1/2	129699	24.88	130106	32.61	163579	32.61
7/32	1/4	5/8	2-1/2	129710	25.41	130117	29.52	163590	29.52
15/64	1/4	3/4	2-1/2	129721	28.71	130128	37.00	163601	37.00
1/4	1/4	3/4	2-1/2	129732	21.05	130139	29.52	163612	29.52
17/64	5/16	3/4	2-1/2	129743	37.96	130150	48.77	163623	48.77
9/32	5/16	3/4	2-1/2	129754	37.96	130161	48.77	163634	48.77
19/64	5/16	13/16	2-1/2	129765	37.96	130172	48.77	163645	48.77
5/16	5/16	13/16	2-1/2	129776	27.40	130183	35.33	163656	35.33
21/64	3/8	1	2-1/2	129787	42.56	130194	54.72	163667	54.72
11/32	3/8	1	2-1/2	129798	42.56	130205	54.72	163678	54.72
23/64	3/8	1	2-1/2	129809	42.56	130216	54.72	163689	54.72
3/8	3/8	1	2-1/2	129820	32.68	130227	40.40	163700	40.40
25/64	7/16	1	2-3/4	129831	55.71	130238	71.91	163711	71.91
13/32	7/16	1	2-3/4	129842	55.71	130249	71.91	163722	71.91
27/64	7/16	1	2-3/4	129853	57.52	130260	74.28	163733	74.28
7/16	7/16	1	2-3/4	129864	50.15	130271	61.74	163744	61.74
29/64	1/2	1	3	129875	82.79	130282	105.97	163755	105.97
15/32	1/2	1	3	129886	82.79	130293	105.97	163766	105.97
31/64	1/2	1	3	129897	82.79	130304	105.97	163777	105.97
1/2	1/2	1	3	129908	60.21	130315	75.13	163788	75.13
9/16	9/16	1-1/4	3-1/2	129919	113.80	130326	150.27	163799	150.27
5/8	5/8	1-1/4	3-1/2	129930	115.11	130337	146.76	163810	146.76
3/4	3/4	1-1/2	4	129941	161.68	130348	208.25	163821	208.25
7/8	7/8	1-1/2	4	129952	295.72	130359	374.29	163832	374.29
1	1	1-1/2	4	129963	264.49	130370	338.31	163843	338.31

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -.0004
1/8" - 1/2"	+0.00, -0.002	-0.001, -.0004
9/16" - 1"	+0.00, -0.003	-0.001, -.0004

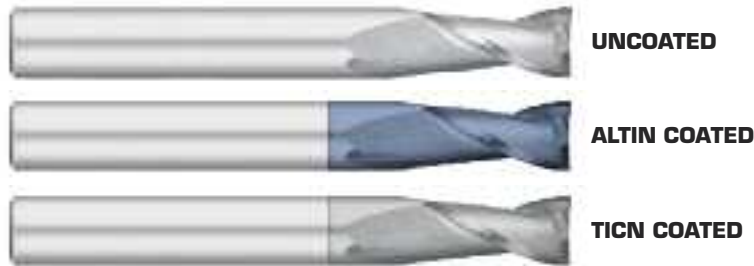
ENDMILLS  
MICRO  
THREADMILLS  
DRILL MILLS  
CHAMFER MILLS  
DRILLS  
REAMERS  
BURS

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136134	20.20	136288	25.98	165097	25.98
3/16	3/16	3/4	2-1/2	136145	23.71	136299	30.48	165108	30.48
1/4	1/4	1-1/8	3	136156	33.95	136310	43.77	165119	43.77
1/4	1/4	1	4	136167	35.76	136321	46.11	165130	46.11
5/16	5/16	1-1/8	3	136178	38.31	136332	51.71	165141	51.71
3/8	3/8	1-1/8	3	136189	43.95	136343	59.33	165152	59.33
3/8	3/8	1	4	136200	51.32	136354	66.03	165163	66.03
7/16	7/16	2	4	136211	69.25	136365	90.05	165174	90.05
1/2	1/2	1	4	136222	74.99	136376	96.58	165185	96.58
1/2	1/2	2	4	136233	79.42	136387	101.93	165196	101.93
5/8	5/8	2-1/4	5	136244	177.52	136398	219.70	165207	219.70
3/4	3/4	2-1/4	5	136255	245.18	136409	316.34	165218	316.34
7/8	7/8	2-1/4	5	136266	464.70	136420	549.19	165229	549.19
1	1	2-1/4	5	136277	335.66	136431	433.22	165240	433.22

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137366	22.58	137520	30.48	165713	30.48
3/16	3/16	1-1/8	3	137377	24.56	137531	31.54	165724	31.54
1/4	1/4	1-1/2	4	137388	36.78	137542	47.37	165735	47.37
1/4	1/4	1-1/2	6	137399	46.92	137553	60.36	165746	60.36
5/16	5/16	1-5/8	4	137410	47.35	137564	61.10	165757	61.10
3/8	3/8	1-3/4	4	137421	53.76	137575	68.86	165768	68.86
3/8	3/8	1-1/2	6	137432	81.41	137586	104.94	165779	104.94
7/16	7/16	3	6	137443	109.65	137597	140.59	165790	140.59
1/2	1/2	1-1/2	6	137454	123.90	137608	153.78	165801	153.78
1/2	1/2	3	6	137465	130.07	137619	159.94	165812	159.94
5/8	5/8	3	6	137476	191.56	137630	235.50	165823	235.50
3/4	3/4	3	6	137487	284.69	137641	349.73	165834	349.73
7/8	7/8	3	6	137498	506.94	137652	633.71	165845	633.71
1	1	3	6	137509	483.30	137663	593.91	165856	593.91

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

## REGULAR 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
1/64	1/8	1/32	1-1/2	131635	28.14	132042	37.71	164283	37.71
1/32	1/8	1/8	1-1/2	131646	18.00	132053	23.39	164294	23.39
3/64	1/8	1/8	1-1/2	131657	18.00	132064	23.39	164305	23.39
1/16	1/8	1/4	1-1/2	131668	16.69	132075	22.54	164316	22.54
5/64	1/8	1/4	1-1/2	131679	16.69	132086	22.54	164327	22.54
3/32	1/8	3/8	1-1/2	131690	17.51	132097	23.67	164338	23.67
7/64	1/8	3/8	1-1/2	131701	17.51	132108	23.67	164349	23.67
1/8	1/8	1/2	1-1/2	131712	16.05	132119	21.69	164360	21.69
9/64	3/16	9/16	2	131723	23.53	132130	31.79	164371	31.79
5/32	3/16	9/16	2	131734	23.53	132141	31.79	164382	31.79
11/64	3/16	5/8	2	131745	23.53	132152	31.79	164393	31.79
3/16	3/16	5/8	2	131756	21.16	132163	28.57	164404	28.57
13/64	1/4	5/8	2-1/2	131767	27.43	132174	38.88	164415	38.88
7/32	1/4	5/8	2-1/2	131778	27.43	132185	38.88	164426	38.88
15/64	1/4	3/4	2-1/2	131789	27.43	132196	38.88	164437	38.88
1/4	1/4	3/4	2-1/2	131800	28.74	132207	37.04	164448	37.04
17/64	5/16	3/4	2-1/2	131811	38.88	132218	50.01	164459	50.01
9/32	5/16	3/4	2-1/2	131822	38.95	132229	50.08	164470	50.08
19/64	5/16	13/16	2-1/2	131833	42.32	132240	55.54	164481	55.54
5/16	5/16	13/16	2-1/2	131844	35.83	132251	46.07	164492	46.07
21/64	3/8	1	2-1/2	131855	49.23	132262	66.45	164503	66.45
11/32	3/8	1	2-1/2	131866	51.67	132273	66.45	164514	66.45
23/64	3/8	1	2-1/2	131877	49.23	132284	66.45	164525	66.45
3/8	3/8	1	2-1/2	131888	38.35	132295	54.19	164536	54.19
25/64	7/16	1	2-3/4	131899	66.66	132306	85.91	164547	85.91
13/32	7/16	1	2-3/4	131910	66.66	132317	85.91	164558	85.91
27/64	7/16	1	2-3/4	131921	66.66	132328	85.91	164569	85.91
7/16	7/16	1	2-3/4	131932	56.74	132339	73.15	164580	73.15
29/64	1/2	1	3	131943	87.89	132350	113.34	164591	113.34
15/32	1/2	1	3	131954	87.89	132361	113.34	164602	113.34
31/64	1/2	1	3	131965	87.89	132372	113.34	164613	113.34
1/2	1/2	1	3	131976	77.83	132383	100.30	164624	100.30
9/16	9/16	1-1/4	3-1/2	131987	118.62	132394	145.98	164635	145.98
5/8	5/8	1-1/4	3-1/2	131998	125.85	132405	162.21	164646	162.21
3/4	3/4	1-1/2	4	132009	185.42	132416	241.63	164657	241.63
7/8	7/8	1-1/2	4	132020	359.08	132427	456.26	164668	456.26
1	1	1-1/2	4	132031	331.19	132438	426.77	164679	426.77

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.002	-0.001, -0.004
9/16" - 1"	+0.00, -0.003	-0.001, -0.004

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136750	24.03	136904	30.90	165405	30.90
3/16	3/16	3/4	2-1/2	136761	27.64	136915	35.51	165416	35.51
1/4	1/4	1-1/8	3	136772	38.88	136926	50.04	165427	50.04
1/4	1/4	1	4	136783	42.92	136937	55.32	165438	55.32
5/16	5/16	1-1/8	3	136794	45.72	136948	61.70	165449	61.70
3/8	3/8	1-1/8	3	136805	52.77	136959	71.27	165460	71.27
3/8	3/8	1	4	136816	64.64	136970	83.99	165471	83.99
7/16	7/16	2	4	136827	88.39	136981	114.93	165482	114.93
1/2	1/2	1	4	136838	90.52	136992	115.11	165493	115.11
1/2	1/2	2	4	136849	91.40	137003	116.00	165504	116.00
5/8	5/8	2-1/4	5	136860	208.25	137014	264.49	165515	264.49
3/4	3/4	2-1/4	5	136871	289.97	137025	367.31	165526	367.31
7/8	7/8	2-1/4	5	136882	498.51	137036	612.59	165537	612.59
1	1	2-1/4	5	136893	573.78	137047	705.62	165548	705.62

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	138026	26.90	138180	36.29	166021	36.29
3/16	3/16	1-1/8	3	138037	29.45	138191	37.89	166032	37.89
1/4	1/4	1-1/2	4	138048	40.89	138202	52.59	166043	52.59
1/4	1/4	1-1/2	6	138059	48.02	138213	61.77	166054	61.77
5/16	5/16	1-5/8	4	138070	57.13	138224	73.75	166065	73.75
3/8	3/8	1-3/4	4	138081	61.49	138235	78.61	166076	78.61
3/8	3/8	1-1/2	6	138092	86.65	138246	106.36	166087	106.36
7/16	7/16	3	6	138103	130.07	138257	166.96	166098	166.96
1/2	1/2	1-1/2	6	138114	137.97	138268	176.64	166109	176.64
1/2	1/2	3	6	138125	138.82	138279	177.52	166120	177.52
5/8	5/8	3	6	138136	218.81	138290	268.89	166131	268.89
3/4	3/4	3	6	138147	310.28	138301	418.87	166142	418.87
7/8	7/8	3	6	138158	549.19	138312	684.39	166153	684.39
1	1	3	6	138169	553.58	138323	712.71	166164	712.71

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

**REGULAR LENGTH - 2 FLUTE -  CORNER RADIUS - 30° HELIX**



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.015	150973	18.29
1/8	1/8	1/2	1-1/2	0.020	150984	18.29
1/8	1/8	1/2	1-1/2	0.030	150995	18.29
3/16	3/16	5/8	2	0.015	151006	18.29
3/16	3/16	5/8	2	0.020	151017	18.29
3/16	3/16	5/8	2	0.030	151028	18.29
1/4	1/4	3/4	2-1/2	0.015	151039	26.62
1/4	1/4	3/4	2-1/2	0.020	151050	26.62
1/4	1/4	3/4	2-1/2	0.030	151061	26.62
1/4	1/4	3/4	2-1/2	0.045	151072	26.62
1/4	1/4	3/4	2-1/2	0.060	151083	26.62
5/16	5/16	13/16	2-1/2	0.015	151094	40.83
5/16	5/16	13/16	2-1/2	0.020	151105	40.83
5/16	5/16	13/16	2-1/2	0.030	151116	40.83
5/16	5/16	13/16	2-1/2	0.045	151127	40.83
5/16	5/16	13/16	2-1/2	0.060	151138	40.83
3/8	3/8	1	2-1/2	0.015	151149	54.71
3/8	3/8	1	2-1/2	0.020	151160	54.71
3/8	3/8	1	2-1/2	0.030	151171	54.71
3/8	3/8	1	2-1/2	0.045	151182	54.71
3/8	3/8	1	2-1/2	0.060	151193	54.71
1/2	1/2	1	3	0.015	151204	94.11
1/2	1/2	1	3	0.020	151215	94.11
1/2	1/2	1	3	0.030	151226	94.11

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	0.045	151237	94.11
1/2	1/2	1	3	0.060	151248	94.11
1/2	1/2	1	3	0.090	151259	94.11
1/2	1/2	1	3	0.125	151270	94.11
5/8	5/8	1-1/4	3-1/2	0.015	151281	133.15
5/8	5/8	1-1/4	3-1/2	0.020	151292	133.15
5/8	5/8	1-1/4	3-1/2	0.030	151303	133.15
5/8	5/8	1-1/4	3-1/2	0.045	151314	133.15
5/8	5/8	1-1/4	3-1/2	0.060	151325	133.15
5/8	5/8	1-1/4	3-1/2	0.090	151336	133.15
3/4	3/4	1-1/2	4	0.015	151347	196.99
3/4	3/4	1-1/2	4	0.020	151358	196.99
3/4	3/4	1-1/2	4	0.030	151369	196.99
3/4	3/4	1-1/2	4	0.045	151380	196.99
3/4	3/4	1-1/2	4	0.060	151391	196.99
3/4	3/4	1-1/2	4	0.090	151402	196.99
3/4	3/4	1-1/2	4	0.125	151413	196.99
1	1	1-1/2	4	0.015	151424	372.73
1	1	1-1/2	4	0.020	151435	372.73
1	1	1-1/2	4	0.030	151446	372.73
1	1	1-1/2	4	0.045	151457	372.73
1	1	1-1/2	4	0.060	151468	372.73
1	1	1-1/2	4	0.090	151479	372.73
1	1	1-1/2	4	0.125	151490	372.73

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



ALTIM COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.015	151501	28.41
1/8	1/8	1/2	1-1/2	0.020	151512	28.41
1/8	1/8	1/2	1-1/2	0.030	151523	28.41
3/16	3/16	5/8	2	0.015	151534	28.41
3/16	3/16	5/8	2	0.020	151545	28.41
3/16	3/16	5/8	2	0.030	151556	28.41
1/4	1/4	3/4	2-1/2	0.015	151567	39.04
1/4	1/4	3/4	2-1/2	0.020	151578	39.04
1/4	1/4	3/4	2-1/2	0.030	151589	39.04
1/4	1/4	3/4	2-1/2	0.045	151600	39.04
1/4	1/4	3/4	2-1/2	0.060	151611	39.04
5/16	5/16	13/16	2-1/2	0.015	151622	56.15
5/16	5/16	13/16	2-1/2	0.020	151633	56.15
5/16	5/16	13/16	2-1/2	0.030	151644	56.15
5/16	5/16	13/16	2-1/2	0.045	151655	56.15
5/16	5/16	13/16	2-1/2	0.060	151666	56.15
3/8	3/8	1	2-1/2	0.015	151677	60.83
3/8	3/8	1	2-1/2	0.020	151688	60.83
3/8	3/8	1	2-1/2	0.030	151699	60.83
3/8	3/8	1	2-1/2	0.045	151710	60.83
3/8	3/8	1	2-1/2	0.060	151721	60.83
1/2	1/2	1	3	0.015	151732	101.88
1/2	1/2	1	3	0.020	151743	101.88
1/2	1/2	1	3	0.030	151754	101.88

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	0.045	151765	101.88
1/2	1/2	1	3	0.060	151776	101.88
1/2	1/2	1	3	0.090	151787	101.88
1/2	1/2	1	3	0.125	151798	101.88
5/8	5/8	1-1/4	3-1/2	0.015	151809	146.61
5/8	5/8	1-1/4	3-1/2	0.020	151820	146.61
5/8	5/8	1-1/4	3-1/2	0.030	151831	146.61
5/8	5/8	1-1/4	3-1/2	0.045	151842	146.61
5/8	5/8	1-1/4	3-1/2	0.060	151853	146.61
5/8	5/8	1-1/4	3-1/2	0.090	151864	146.61
3/4	3/4	1-1/2	4	0.015	151875	205.87
3/4	3/4	1-1/2	4	0.020	151886	205.87
3/4	3/4	1-1/2	4	0.030	151897	205.87
3/4	3/4	1-1/2	4	0.045	151908	205.87
3/4	3/4	1-1/2	4	0.060	151919	205.87
3/4	3/4	1-1/2	4	0.090	151930	205.87
3/4	3/4	1-1/2	4	0.125	151941	205.87
1	1	1-1/2	4	0.015	151952	429.67
1	1	1-1/2	4	0.020	151963	429.67
1	1	1-1/2	4	0.030	151974	429.67
1	1	1-1/2	4	0.045	151985	429.67
1	1	1-1/2	4	0.060	151996	429.67
1	1	1-1/2	4	0.090	152007	429.67
1	1	1-1/2	4	0.125	152018	429.67

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

**REGULAR LENGTH - 4 FLUTE -  CORNER RADIUS - 30° HELIX**



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.015	152029	18.29
1/8	1/8	1/2	1-1/2	0.020	152040	18.29
1/8	1/8	1/2	1-1/2	0.030	152051	18.29
3/16	3/16	5/8	2	0.015	152062	18.29
3/16	3/16	5/8	2	0.020	152073	18.29
3/16	3/16	5/8	2	0.030	152084	18.29
1/4	1/4	3/4	2-1/2	0.015	152095	26.62
1/4	1/4	3/4	2-1/2	0.020	152106	26.62
1/4	1/4	3/4	2-1/2	0.030	152117	26.62
1/4	1/4	3/4	2-1/2	0.045	152128	26.62
1/4	1/4	3/4	2-1/2	0.060	152139	26.62
5/16	5/16	13/16	2-1/2	0.015	152150	42.33
5/16	5/16	13/16	2-1/2	0.020	152161	42.33
5/16	5/16	13/16	2-1/2	0.030	152172	42.33
5/16	5/16	13/16	2-1/2	0.045	152183	42.33
5/16	5/16	13/16	2-1/2	0.060	152194	42.33
3/8	3/8	1	2-1/2	0.015	152205	50.13
3/8	3/8	1	2-1/2	0.020	152216	50.13
3/8	3/8	1	2-1/2	0.030	152227	50.13
3/8	3/8	1	2-1/2	0.045	152238	50.13
3/8	3/8	1	2-1/2	0.060	152249	50.13
1/2	1/2	1	3	0.015	152260	85.78
1/2	1/2	1	3	0.020	152271	85.78
1/2	1/2	1	3	0.030	152282	85.78

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	0.045	152293	85.78
1/2	1/2	1	3	0.060	152304	85.78
1/2	1/2	1	3	0.090	152315	85.78
1/2	1/2	1	3	0.125	152326	85.78
5/8	5/8	1-1/4	3-1/2	0.015	152337	133.15
5/8	5/8	1-1/4	3-1/2	0.020	152348	133.15
5/8	5/8	1-1/4	3-1/2	0.030	152359	133.15
5/8	5/8	1-1/4	3-1/2	0.045	152370	133.15
5/8	5/8	1-1/4	3-1/2	0.060	152381	133.15
5/8	5/8	1-1/4	3-1/2	0.090	152392	133.15
3/4	3/4	1-1/2	4	0.015	152403	196.99
3/4	3/4	1-1/2	4	0.020	152414	196.99
3/4	3/4	1-1/2	4	0.030	152425	196.99
3/4	3/4	1-1/2	4	0.045	152436	196.99
3/4	3/4	1-1/2	4	0.060	152447	196.99
3/4	3/4	1-1/2	4	0.090	152458	196.99
3/4	3/4	1-1/2	4	0.125	152469	196.99
1	1	1-1/2	4	0.015	152480	372.73
1	1	1-1/2	4	0.020	152491	372.73
1	1	1-1/2	4	0.030	152502	372.73
1	1	1-1/2	4	0.045	152513	372.73
1	1	1-1/2	4	0.060	152524	372.73
1	1	1-1/2	4	0.090	152535	372.73
1	1	1-1/2	4	0.125	152546	372.73

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 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

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	0.015	152557	28.41
1/8	1/8	1/2	1-1/2	0.020	152568	28.41
1/8	1/8	1/2	1-1/2	0.030	152579	28.41
3/16	3/16	5/8	2	0.015	152590	28.41
3/16	3/16	5/8	2	0.020	152601	28.41
3/16	3/16	5/8	2	0.030	152612	28.41
1/4	1/4	3/4	2-1/2	0.015	152623	39.04
1/4	1/4	3/4	2-1/2	0.020	152634	39.04
1/4	1/4	3/4	2-1/2	0.030	152645	39.04
1/4	1/4	3/4	2-1/2	0.045	152656	39.04
1/4	1/4	3/4	2-1/2	0.060	152667	39.04
5/16	5/16	13/16	2-1/2	0.015	152678	52.36
5/16	5/16	13/16	2-1/2	0.020	152689	52.36
5/16	5/16	13/16	2-1/2	0.030	152700	52.36
5/16	5/16	13/16	2-1/2	0.045	152711	52.36
5/16	5/16	13/16	2-1/2	0.060	152722	52.36
3/8	3/8	1	2-1/2	0.015	152733	65.73
3/8	3/8	1	2-1/2	0.020	152744	65.73
3/8	3/8	1	2-1/2	0.030	152755	65.73
3/8	3/8	1	2-1/2	0.045	152766	65.73
3/8	3/8	1	2-1/2	0.060	152777	65.73
1/2	1/2	1	3	0.015	152788	99.15
1/2	1/2	1	3	0.020	152799	99.15
1/2	1/2	1	3	0.030	152810	99.15

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	3	0.045	152821	99.15
1/2	1/2	1	3	0.060	152832	99.15
1/2	1/2	1	3	0.090	152843	99.15
1/2	1/2	1	3	0.125	152854	99.15
5/8	5/8	1-1/4	3-1/2	0.015	152865	161.54
5/8	5/8	1-1/4	3-1/2	0.020	152876	161.54
5/8	5/8	1-1/4	3-1/2	0.030	152887	161.54
5/8	5/8	1-1/4	3-1/2	0.045	152898	161.54
5/8	5/8	1-1/4	3-1/2	0.060	152909	161.54
5/8	5/8	1-1/4	3-1/2	0.090	152920	161.54
3/4	3/4	1-1/2	4	0.015	152931	221.70
3/4	3/4	1-1/2	4	0.020	152942	221.70
3/4	3/4	1-1/2	4	0.030	152953	221.70
3/4	3/4	1-1/2	4	0.045	152964	221.70
3/4	3/4	1-1/2	4	0.060	152975	221.70
3/4	3/4	1-1/2	4	0.090	152986	221.70
3/4	3/4	1-1/2	4	0.125	152997	221.70
1	1	1-1/2	4	0.015	153008	429.67
1	1	1-1/2	4	0.020	153019	429.67
1	1	1-1/2	4	0.030	153030	429.67
1	1	1-1/2	4	0.045	153041	429.67
1	1	1-1/2	4	0.060	153052	429.67
1	1	1-1/2	4	0.090	153063	429.67
1	1	1-1/2	4	0.125	153074	429.67

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

53

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



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



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153085	24.98
1/8	1/8	3/4	2-1/4	0.020	153096	24.98
1/8	1/8	3/4	2-1/4	0.030	153107	24.98
3/16	3/16	3/4	2-1/2	0.015	153118	29.03
3/16	3/16	3/4	2-1/2	0.020	153129	29.03
3/16	3/16	3/4	2-1/2	0.030	153140	29.03
1/4	1/4	1-1/8	3	0.015	153151	40.51
1/4	1/4	1-1/8	3	0.020	153162	40.51
1/4	1/4	1-1/8	3	0.030	153173	40.51
1/4	1/4	1-1/8	3	0.045	153184	40.51
1/4	1/4	1-1/8	3	0.060	153195	40.51
1/4	1/4	1	4	0.015	153206	42.54
1/4	1/4	1	4	0.020	153217	42.54
1/4	1/4	1	4	0.030	153228	42.54
1/4	1/4	1	4	0.045	153239	42.54
1/4	1/4	1	4	0.060	153250	42.54
5/16	5/16	1-1/8	3	0.015	153261	45.91
5/16	5/16	1-1/8	3	0.020	153272	45.91
5/16	5/16	1-1/8	3	0.030	153283	45.91
5/16	5/16	1-1/8	3	0.045	153294	45.91
5/16	5/16	1-1/8	3	0.060	153305	45.91
3/8	3/8	1-1/8	3	0.015	153316	59.04
3/8	3/8	1-1/8	3	0.020	153327	59.04
3/8	3/8	1-1/8	3	0.030	153338	59.04
3/8	3/8	1-1/8	3	0.045	153349	59.04
3/8	3/8	1-1/8	3	0.060	153360	59.04
3/8	3/8	1	4	0.015	153371	72.19
3/8	3/8	1	4	0.020	153382	72.19
3/8	3/8	1	4	0.030	153393	72.19
3/8	3/8	1	4	0.045	153404	72.19
3/8	3/8	1	4	0.060	153415	72.19
1/2	1/2	1	4	0.015	153426	101.38
1/2	1/2	1	4	0.020	153437	101.38

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	153448	101.38
1/2	1/2	1	4	0.045	153459	101.38
1/2	1/2	1	4	0.060	153470	101.38
1/2	1/2	1	4	0.090	153481	101.38
1/2	1/2	1	4	0.125	153492	101.38
1/2	1/2	2	4	0.015	153503	108.06
1/2	1/2	2	4	0.020	153514	108.06
1/2	1/2	2	4	0.030	153525	108.06
1/2	1/2	2	4	0.045	153536	108.06
1/2	1/2	2	4	0.060	153547	108.06
1/2	1/2	2	4	0.090	153558	108.06
1/2	1/2	2	4	0.125	153569	108.06
5/8	5/8	2-1/4	5	0.015	153580	191.75
5/8	5/8	2-1/4	5	0.020	153591	191.75
5/8	5/8	2-1/4	5	0.030	153602	191.75
5/8	5/8	2-1/4	5	0.045	153613	191.75
5/8	5/8	2-1/4	5	0.060	153624	191.75
5/8	5/8	2-1/4	5	0.090	153635	191.75
3/4	3/4	2-1/4	5	0.015	153646	267.37
3/4	3/4	2-1/4	5	0.020	153657	267.37
3/4	3/4	2-1/4	5	0.030	153668	267.37
3/4	3/4	2-1/4	5	0.045	153679	267.37
3/4	3/4	2-1/4	5	0.060	153690	267.37
3/4	3/4	2-1/4	5	0.090	153701	267.37
3/4	3/4	2-1/4	5	0.125	153712	267.37
1	1	2-1/4	5	0.015	153723	392.14
1	1	2-1/4	5	0.020	153734	392.14
1	1	2-1/4	5	0.030	153745	392.14
1	1	2-1/4	5	0.045	153756	392.14
1	1	2-1/4	5	0.060	153767	392.14
1	1	2-1/4	5	0.090	153778	392.14
1	1	2-1/4	5	0.125	153789	392.14
-	-	-	-	-	-	-

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

ENDMILLS  
 MICRO  
 THREADMILLS  
 DRILL MILLS  
 CHAMFER MILLS  
 DRILLS  
 REAMERS  
 BURS

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153800	31.23
1/8	1/8	3/4	2-1/4	0.020	153811	31.23
1/8	1/8	3/4	2-1/4	0.030	153822	31.23
3/16	3/16	3/4	2-1/2	0.015	153833	36.29
3/16	3/16	3/4	2-1/2	0.020	153844	36.29
3/16	3/16	3/4	2-1/2	0.030	153855	36.29
1/4	1/4	1-1/8	3	0.015	153866	50.64
1/4	1/4	1-1/8	3	0.020	153877	50.64
1/4	1/4	1-1/8	3	0.030	153888	50.64
1/4	1/4	1-1/8	3	0.045	153899	50.64
1/4	1/4	1-1/8	3	0.060	153910	50.64
1/4	1/4	1	4	0.015	153921	53.17
1/4	1/4	1	4	0.020	153932	53.17
1/4	1/4	1	4	0.030	153943	53.17
1/4	1/4	1	4	0.045	153954	53.17
1/4	1/4	1	4	0.060	153965	53.17
5/16	5/16	1-1/8	3	0.015	153976	57.39
5/16	5/16	1-1/8	3	0.020	153987	57.39
5/16	5/16	1-1/8	3	0.030	153998	57.39
5/16	5/16	1-1/8	3	0.045	154009	57.39
5/16	5/16	1-1/8	3	0.060	154020	57.39
3/8	3/8	1-1/8	3	0.015	154031	72.41
3/8	3/8	1-1/8	3	0.020	154042	72.41
3/8	3/8	1-1/8	3	0.030	154053	72.41
3/8	3/8	1-1/8	3	0.045	154064	72.41
3/8	3/8	1-1/8	3	0.060	154075	72.41
3/8	3/8	1	4	0.015	154086	90.24
3/8	3/8	1	4	0.020	154097	90.24
3/8	3/8	1	4	0.030	154108	90.24
3/8	3/8	1	4	0.045	154119	90.24
3/8	3/8	1	4	0.060	154130	90.24
1/2	1/2	1	4	0.015	154141	124.77
1/2	1/2	1	4	0.020	154152	124.77

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	154163	124.77
1/2	1/2	1	4	0.045	154174	124.77
1/2	1/2	1	4	0.060	154185	124.77
1/2	1/2	1	4	0.090	154196	124.77
1/2	1/2	1	4	0.125	154207	124.77
1/2	1/2	2	4	0.015	154218	132.57
1/2	1/2	2	4	0.020	154229	132.57
1/2	1/2	2	4	0.030	154240	132.57
1/2	1/2	2	4	0.045	154251	132.57
1/2	1/2	2	4	0.060	154262	132.57
1/2	1/2	2	4	0.090	154273	132.57
1/2	1/2	2	4	0.125	154284	132.57
5/8	5/8	2-1/4	5	0.015	154295	239.69
5/8	5/8	2-1/4	5	0.020	154306	239.69
5/8	5/8	2-1/4	5	0.030	154317	239.69
5/8	5/8	2-1/4	5	0.045	154328	239.69
5/8	5/8	2-1/4	5	0.060	154339	239.69
5/8	5/8	2-1/4	5	0.090	154350	239.69
3/4	3/4	2-1/4	5	0.015	154361	311.93
3/4	3/4	2-1/4	5	0.020	154372	311.93
3/4	3/4	2-1/4	5	0.030	154383	311.93
3/4	3/4	2-1/4	5	0.045	154394	311.93
3/4	3/4	2-1/4	5	0.060	154405	311.93
3/4	3/4	2-1/4	5	0.090	154416	311.93
3/4	3/4	2-1/4	5	0.125	154427	311.93
1	1	2-1/4	5	0.015	154438	490.18
1	1	2-1/4	5	0.020	154449	490.18
1	1	2-1/4	5	0.030	154460	490.18
1	1	2-1/4	5	0.045	154471	490.18
1	1	2-1/4	5	0.060	154482	490.18
1	1	2-1/4	5	0.090	154493	490.18
1	1	2-1/4	5	0.125	154504	490.18
-	-	-	-	-	-	-

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

55

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

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



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	154515	28.36
1/8	1/8	1	3	0.020	154526	28.36
1/8	1/8	1	3	0.030	154537	28.36
3/16	3/16	1-1/8	3	0.015	154548	31.06
3/16	3/16	1-1/8	3	0.020	154559	31.06
3/16	3/16	1-1/8	3	0.030	154570	31.06
1/4	1/4	1-1/2	4	0.015	154581	43.21
1/4	1/4	1-1/2	4	0.020	154592	43.21
1/4	1/4	1-1/2	4	0.030	154603	43.21
1/4	1/4	1-1/2	4	0.045	154614	43.21
1/4	1/4	1-1/2	4	0.060	154625	43.21
1/4	1/4	1-1/2	6	0.015	154636	58.07
1/4	1/4	1-1/2	6	0.020	154647	58.07
1/4	1/4	1-1/2	6	0.030	154658	58.07
1/4	1/4	1-1/2	6	0.045	154669	58.07
1/4	1/4	1-1/2	6	0.060	154680	58.07
5/16	5/16	1-5/8	4	0.015	154691	59.42
5/16	5/16	1-5/8	4	0.020	154702	59.42
5/16	5/16	1-5/8	4	0.030	154713	59.42
5/16	5/16	1-5/8	4	0.045	154724	59.42
5/16	5/16	1-5/8	4	0.060	154735	59.42
3/8	3/8	1-3/4	4	0.015	154746	64.82
3/8	3/8	1-3/4	4	0.020	154757	64.82
3/8	3/8	1-3/4	4	0.030	154768	64.82
3/8	3/8	1-3/4	4	0.045	154779	64.82
3/8	3/8	1-3/4	4	0.060	154790	64.82
3/8	3/8	1-1/2	6	0.015	154801	91.82
3/8	3/8	1-1/2	6	0.020	154812	91.82
3/8	3/8	1-1/2	6	0.030	154823	91.82
3/8	3/8	1-1/2	6	0.045	154834	91.82
3/8	3/8	1-1/2	6	0.060	154845	91.82
1/2	1/2	1-1/2	6	0.015	154856	139.09
1/2	1/2	1-1/2	6	0.020	154867	139.09
1/2	1/2	1-1/2	6	0.030	154878	139.09
1/2	1/2	1-1/2	6	0.045	154889	139.09
1/2	1/2	1-1/2	6	0.060	154900	139.09
1/2	1/2	1-1/2	6	0.090	154911	139.09
1/2	1/2	1-1/2	6	0.125	154922	139.09
1/2	1/2	3	6	0.015	154933	145.84
1/2	1/2	3	6	0.020	154944	145.84

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	154955	145.84
1/2	1/2	3	6	0.045	154966	145.84
1/2	1/2	3	6	0.060	154977	145.84
1/2	1/2	3	6	0.090	154988	145.84
1/2	1/2	3	6	0.125	154999	145.84
5/8	5/8	3	6	0.015	155010	205.25
5/8	5/8	3	6	0.020	155021	205.25
5/8	5/8	3	6	0.030	155032	205.25
5/8	5/8	3	6	0.045	155043	205.25
5/8	5/8	3	6	0.060	155054	205.25
5/8	5/8	3	6	0.090	155065	205.25
3/4	3/4	3	6	0.015	155076	286.31
3/4	3/4	3	6	0.020	155087	286.31
3/4	3/4	3	6	0.030	155098	286.31
3/4	3/4	3	6	0.045	155109	286.31
3/4	3/4	3	6	0.060	155120	286.31
3/4	3/4	3	6	0.090	155131	286.31
3/4	3/4	3	6	0.125	155142	286.31
3/4	3/4	4	7	0.015	155153	462.55
3/4	3/4	4	7	0.020	155164	462.55
3/4	3/4	4	7	0.030	155175	462.55
3/4	3/4	4	7	0.045	155186	462.55
3/4	3/4	4	7	0.060	155197	462.55
3/4	3/4	4	7	0.090	155208	462.55
3/4	3/4	4	7	0.125	155219	462.55
1	1	3	6	0.015	155230	483.43
1	1	3	6	0.020	155241	483.43
1	1	3	6	0.030	155252	483.43
1	1	3	6	0.045	155263	483.43
1	1	3	6	0.060	155274	483.43
1	1	3	6	0.090	155285	483.43
1	1	3	6	0.125	155296	483.43
1	1	4	7	0.015	155307	661.68
1	1	4	7	0.020	155318	661.68
1	1	4	7	0.030	155329	661.68
1	1	4	7	0.045	155340	661.68
1	1	4	7	0.060	155351	661.68
1	1	4	7	0.090	155362	661.68
1	1	4	7	0.125	155373	661.68
-	-	-	-	-	-	-

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	155384	35.45
1/8	1/8	1	3	0.020	155395	35.45
1/8	1/8	1	3	0.030	155406	35.45
3/16	3/16	1-1/8	3	0.015	155417	38.82
3/16	3/16	1-1/8	3	0.020	155428	38.82
3/16	3/16	1-1/8	3	0.030	155439	38.82
1/4	1/4	1-1/2	4	0.015	155450	54.01
1/4	1/4	1-1/2	4	0.020	155461	54.01
1/4	1/4	1-1/2	4	0.030	155472	54.01
1/4	1/4	1-1/2	4	0.045	155483	54.01
1/4	1/4	1-1/2	4	0.060	155494	54.01
1/4	1/4	1-1/2	6	0.015	155505	72.58
1/4	1/4	1-1/2	6	0.020	155516	72.58
1/4	1/4	1-1/2	6	0.030	155527	72.58
1/4	1/4	1-1/2	6	0.045	155538	72.58
1/4	1/4	1-1/2	6	0.060	155549	72.58
5/16	5/16	1-5/8	4	0.015	155560	74.27
5/16	5/16	1-5/8	4	0.020	155571	74.27
5/16	5/16	1-5/8	4	0.030	155582	74.27
5/16	5/16	1-5/8	4	0.045	155593	74.27
5/16	5/16	1-5/8	4	0.060	155604	74.27
3/8	3/8	1-3/4	4	0.015	155615	81.02
3/8	3/8	1-3/4	4	0.020	155626	81.02
3/8	3/8	1-3/4	4	0.030	155637	81.02
3/8	3/8	1-3/4	4	0.045	155648	81.02
3/8	3/8	1-3/4	4	0.060	155659	81.02
3/8	3/8	1-1/2	6	0.015	155670	114.78
3/8	3/8	1-1/2	6	0.020	155681	114.78
3/8	3/8	1-1/2	6	0.030	155692	114.78
3/8	3/8	1-1/2	6	0.045	155703	114.78
3/8	3/8	1-1/2	6	0.060	155714	114.78
1/2	1/2	1-1/2	6	0.015	155725	173.86
1/2	1/2	1-1/2	6	0.020	155736	173.86
1/2	1/2	1-1/2	6	0.030	155747	173.86
1/2	1/2	1-1/2	6	0.045	155758	173.86
1/2	1/2	1-1/2	6	0.060	155769	173.86
1/2	1/2	1-1/2	6	0.090	155780	173.86
1/2	1/2	1-1/2	6	0.125	155791	173.86
1/2	1/2	3	6	0.015	155802	182.30
1/2	1/2	3	6	0.020	155813	182.30

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	155824	182.30
1/2	1/2	3	6	0.045	155835	182.30
1/2	1/2	3	6	0.060	155846	182.30
1/2	1/2	3	6	0.090	155857	182.30
1/2	1/2	3	6	0.125	155868	182.30
5/8	5/8	3	6	0.015	155879	256.57
5/8	5/8	3	6	0.020	155890	256.57
5/8	5/8	3	6	0.030	155901	256.57
5/8	5/8	3	6	0.045	155912	256.57
5/8	5/8	3	6	0.060	155923	256.57
5/8	5/8	3	6	0.090	155934	256.57
3/4	3/4	3	6	0.015	155945	352.04
3/4	3/4	3	6	0.020	155956	352.04
3/4	3/4	3	6	0.030	155967	352.04
3/4	3/4	3	6	0.045	155978	352.04
3/4	3/4	3	6	0.060	155989	352.04
3/4	3/4	3	6	0.090	156000	352.04
3/4	3/4	3	6	0.125	156011	352.04
3/4	3/4	4	7	0.015	156022	578.19
3/4	3/4	4	7	0.020	156033	578.19
3/4	3/4	4	7	0.030	156044	578.19
3/4	3/4	4	7	0.045	156055	578.19
3/4	3/4	4	7	0.060	156066	578.19
3/4	3/4	4	7	0.090	156077	578.19
3/4	3/4	4	7	0.125	156088	578.19
1	1	3	6	0.015	156099	573.73
1	1	3	6	0.020	156110	573.73
1	1	3	6	0.030	156121	573.73
1	1	3	6	0.045	156132	573.73
1	1	3	6	0.060	156143	573.73
1	1	3	6	0.090	156154	573.73
1	1	3	6	0.125	156165	573.73
1	1	4	7	0.015	156176	827.10
1	1	4	7	0.020	156187	827.10
1	1	4	7	0.030	156198	827.10
1	1	4	7	0.045	156209	827.10
1	1	4	7	0.060	156220	827.10
1	1	4	7	0.090	156231	827.10
1	1	4	7	0.125	156242	827.10
-	-	-	-	-	-	-

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

## 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	20.74
1.5	3	4.2	38	133758	20.74
2.0	3	6	38	133769	20.74
2.5	3	8	38	133780	20.74
3.0	3	12	38	133791	20.74
3.5	4	12	50	133802	25.55
4.0	4	14	50	133813	25.55
4.5	6	16	50	133824	31.24
5.0	6	16	50	133835	31.24
6.0	6	19	50	133846	32.65
7.0	8	19	63	133857	35.52
8.0	8	20	63	133868	36.93
9.0	10	22	75	133879	53.97
10.0	10	22	75	133890	68.17
11.0	12	25	75	133901	75.28
12.0	12	25	75	133912	78.10
14.0	14	32	89	133923	132.11
16.0	16	32	89	133934	150.55
18.0	18	38	100	133945	205.97
20.0	20	38	100	133956	326.70
25.0	25	38	100	133967	426.11

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	25.89
1.5	3	4.2	38	133978	25.89
2.0	3	6	38	133989	25.89
2.5	3	8	38	134000	25.89
3.0	3	12	38	134011	25.89
3.5	4	12	50	134022	31.97
4.0	4	14	50	134033	31.97
4.5	6	16	50	134044	39.07
5.0	6	16	50	134055	39.07
6.0	6	19	50	134066	40.83
7.0	8	19	63	134077	44.38
8.0	8	20	63	134088	46.17
9.0	10	22	75	134099	67.45
10.0	10	22	75	134110	85.21
11.0	12	25	75	134121	94.11
12.0	12	25	75	134132	97.66
14.0	14	32	89	134143	165.14
16.0	16	32	89	134154	188.21
18.0	18	38	100	134165	257.45
20.0	20	38	100	134176	408.35
25.0	25	38	100	134187	532.67

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS





# Carbide Endmills

**MADE IN THE USA**

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	23.43	216687	29.28	216599	29.24	216709	36.55
1/32	1/8	1/16	1-1/2	130381	14.43	132449	18.71	130546	18.78	132614	24.03
3/64	1/8	3/32	1-1/2	130392	14.43	132460	18.71	130557	18.78	132625	24.03
1/16	1/8	1/8	1-1/2	130403	10.80	132471	14.09	130568	14.13	132636	18.07
5/64	1/8	1/8	1-1/2	216588	18.26	216698	22.83	216610	22.87	216720	28.56
3/32	1/8	3/16	1-1/2	130414	10.80	132482	14.09	130579	14.13	132647	18.07
1/8	1/8	1/4	1-1/2	130425	10.31	132493	13.46	130590	13.38	132658	17.17
5/32	3/16	5/16	2	130436	17.17	132504	21.22	130601	22.30	132669	28.56
3/16	3/16	3/8	2	130447	16.12	132515	19.98	130612	20.92	132680	26.76
7/32	1/4	7/16	2	130458	21.67	132526	26.88	130623	28.11	132691	35.99
1/4	1/4	1/2	2	130469	19.00	132537	23.62	130634	24.63	132702	31.53
5/16	5/16	1/2	2	130480	25.68	132548	33.40	130645	33.32	132713	42.66
3/8	3/8	5/8	2	130491	33.14	132559	41.05	130656	43.03	132724	52.48
7/16	7/16	5/8	2-1/2	130502	41.35	132570	51.32	130667	53.83	132735	65.64
1/2	1/2	5/8	2-1/2	130513	52.22	132581	64.85	130678	67.81	132746	86.78
5/8	5/8	3/4	3	130524	110.54	132592	130.60	130689	129.51	132757	158.56
3/4	3/4	1	3	130535	154.74	132603	191.47	130700	196.91	132768	252.05

## 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	23.43	216665	29.28	216643	29.24	216731	36.55
1/32	1/8	1/16	1-1/2	131140	14.43	131470	18.71	131305	18.78	133593	24.03
3/64	1/8	3/32	1-1/2	131151	14.43	131481	18.71	131316	18.78	133604	24.03
1/16	1/8	1/8	1-1/2	131162	10.80	131492	14.09	131327	14.13	133615	18.07
5/64	1/8	1/8	1-1/2	216632	18.26	216676	22.83	216654	22.87	216742	28.56
3/32	1/8	3/16	1-1/2	131173	10.80	131503	14.09	131338	14.13	133626	18.07
1/8	1/8	1/4	1-1/2	131184	10.31	131514	13.46	131349	13.38	133637	17.17
5/32	3/16	5/16	2	131195	17.17	131525	21.22	131360	22.30	133648	28.56
3/16	3/16	3/8	2	131206	16.12	131536	19.98	131371	20.92	133659	26.76
7/32	1/4	7/16	2	131217	21.67	131547	26.88	131382	28.11	133670	35.99
1/4	1/4	1/2	2	131228	19.00	131558	23.62	131393	26.73	133681	34.68
5/16	5/16	1/2	2	131239	25.68	131569	33.40	131404	33.32	133692	42.66
3/8	3/8	5/8	2	131250	33.14	131580	41.05	131415	43.03	133703	52.48
7/16	7/16	5/8	2-1/2	131261	41.35	131591	51.32	131426	53.83	133714	65.64
1/2	1/2	5/8	2-1/2	131272	52.22	131602	65.04	131437	67.81	133725	86.78
5/8	5/8	3/4	3	131283	110.54	131613	130.64	131448	129.51	133736	158.56
3/4	3/4	1	3	131294	154.74	131624	191.47	131459	196.91	133747	252.05

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

TOLERANCES	DIAMETER	SHANK
1/64" - 1/2"	+0.00, -0.02	-0.001, -0.004
5/8" - 3/4"	+0.00, -0.03	-0.001, -0.004

**MADE IN USA**

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135166	20.99
3/32	1/8	3/16	1-1/2	135177	21.62
1/8	1/8	1/4	1-1/2	135188	17.45
5/32	3/16	5/16	2	135199	24.53
3/16	3/16	3/8	2	135210	24.53
7/32	1/4	1/2	2-1/2	135221	33.65
1/4	1/4	1/2	2-1/2	135232	33.65
5/16	5/16	1/2	2-1/2	135243	43.51
3/8	3/8	9/16	2-1/2	135254	48.03
7/16	7/16	9/16	2-3/4	135265	67.84
1/2	1/2	5/8	3	135276	83.05

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135892	28.34
3/32	1/8	3/16	1-1/2	135903	29.20
1/8	1/8	1/4	1-1/2	135914	23.54
5/32	3/16	5/16	2	135925	31.68
3/16	3/16	3/8	2	135936	31.68
7/32	1/4	1/2	2-1/2	135947	43.47
1/4	1/4	1/2	2-1/2	135958	43.47
5/16	5/16	1/2	2-1/2	135969	53.42
3/8	3/8	9/16	2-1/2	135980	58.92
7/16	7/16	9/16	2-3/4	135991	83.29
1/2	1/2	5/8	3	136002	112.10

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135287	26.26
3/32	1/8	3/16	1-1/2	135298	27.00
1/8	1/8	1/4	1-1/2	135309	21.81
5/32	3/16	5/16	2	135320	30.65
3/16	3/16	3/8	2	135331	30.65
7/32	1/4	1/2	2-1/2	135342	40.25
1/4	1/4	1/2	2-1/2	135353	40.25
5/16	5/16	1/2	2-1/2	135364	54.40
3/8	3/8	9/16	2-1/2	135375	60.02
7/16	7/16	9/16	2-3/4	135386	84.82
1/2	1/2	5/8	3	135397	103.80

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135408	35.45
3/32	1/8	3/16	1-1/2	135419	36.47
1/8	1/8	1/4	1-1/2	135430	29.44
5/32	3/16	5/16	2	135441	39.58
3/16	3/16	3/8	2	135452	39.58
7/32	1/4	1/2	2-1/2	135463	54.32
1/4	1/4	1/2	2-1/2	135474	54.32
5/16	5/16	1/2	2-1/2	135485	66.74
3/8	3/8	9/16	2-1/2	135496	73.66
7/16	7/16	9/16	2-3/4	135507	104.12
1/2	1/2	5/8	3	135518	140.16

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135529	20.99
3/32	1/8	3/16	1-1/2	135540	21.62
1/8	1/8	1/4	1-1/2	135551	17.45
5/32	3/16	5/16	2	135562	24.53
3/16	3/16	3/8	2	135573	24.53
7/32	1/4	1/2	2-1/2	135584	33.65
1/4	1/4	1/2	2-1/2	135595	33.65
5/16	5/16	1/2	2-1/2	135606	43.51
3/8	3/8	9/16	2-1/2	135617	48.03
7/16	7/16	9/16	2-3/4	135628	67.84
1/2	1/2	5/8	3	135639	83.05

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	136013	28.34
3/32	1/8	3/16	1-1/2	136024	29.20
1/8	1/8	1/4	1-1/2	136035	23.54
5/32	3/16	5/16	2	136046	31.68
3/16	3/16	3/8	2	136057	31.68
7/32	1/4	1/2	2-1/2	136068	43.47
1/4	1/4	1/2	2-1/2	136079	43.47
5/16	5/16	1/2	2-1/2	136090	53.42
3/8	3/8	9/16	2-1/2	136101	58.92
7/16	7/16	9/16	2-3/4	136112	83.29
1/2	1/2	5/8	3	136123	112.10

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135650	26.26
3/32	1/8	3/16	1-1/2	135661	27.00
1/8	1/8	1/4	1-1/2	135672	21.81
5/32	3/16	5/16	2	135683	30.65
3/16	3/16	3/8	2	135694	30.65
7/32	1/4	1/2	2-1/2	135705	40.25
1/4	1/4	1/2	2-1/2	135716	40.25
5/16	5/16	1/2	2-1/2	135727	54.40
3/8	3/8	9/16	2-1/2	135738	60.02
7/16	7/16	9/16	2-3/4	135749	84.82
1/2	1/2	5/8	3	135760	103.80

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/16	1/8	1/8	1-1/2	135771	35.45
3/32	1/8	3/16	1-1/2	135782	36.47
1/8	1/8	1/4	1-1/2	135793	29.44
5/32	3/16	5/16	2	135804	39.58
3/16	3/16	3/8	2	135815	39.58
7/32	1/4	1/2	2-1/2	135826	54.32
1/4	1/4	1/2	2-1/2	135837	54.32
5/16	5/16	1/2	2-1/2	135848	66.74
3/8	3/8	9/16	2-1/2	135859	73.66
7/16	7/16	9/16	2-3/4	135870	104.12
1/2	1/2	5/8	3	135881	140.16

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134198	79.90
5/32	3/8	7/16	3-1/4	134209	79.90
3/16	3/8	1/2	3-1/4	134220	79.90
7/32	3/8	9/16	3-1/2	134231	79.90
1/4	3/8	5/8	3-1/2	134242	79.90
9/32	3/8	11/16	3-1/2	134253	84.00
5/16	3/8	3/4	3-1/2	134264	84.00
11/32	3/8	3/4	3-1/2	134275	84.00
3/8	3/8	3/4	3-1/2	134286	84.00
7/16	1/2	7/8	4	134297	124.96
1/2	1/2	1	4	134308	140.37

NOTE: ALL TOOLS WITH WELDON FLATS

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134319	107.86
5/32	3/8	7/16	3-1/4	134330	107.86
3/16	3/8	1/2	3-1/4	134341	107.86
7/32	3/8	9/16	3-1/2	134352	107.86
1/4	3/8	5/8	3-1/2	134363	107.86
9/32	3/8	11/16	3-1/2	134374	113.41
5/16	3/8	3/4	3-1/2	134385	113.41
11/32	3/8	3/4	3-1/2	134396	113.41
3/8	3/8	3/4	3-1/2	134407	113.41
7/16	1/2	7/8	4	134418	168.75
1/2	1/2	1	4	134429	189.52

NOTE: ALL TOOLS WITH WELDON FLATS

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134682	88.97
5/32	3/8	7/16	3-1/4	134693	88.97
3/16	3/8	1/2	3-1/4	134704	88.97
7/32	3/8	9/16	3-1/2	134715	90.17
1/4	3/8	5/8	3-1/2	134726	90.17
9/32	3/8	11/16	3-1/2	134737	98.79
5/16	3/8	3/4	3-1/2	134748	98.79
11/32	3/8	3/4	3-1/2	134759	98.79
3/8	3/8	3/4	3-1/2	134770	98.79
7/16	1/2	7/8	4	134781	143.00
1/2	1/2	1	4	134792	146.19

NOTE: ALL TOOLS WITH WELDON FLATS

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134803	116.16
5/32	3/8	7/16	3-1/4	134814	116.16
3/16	3/8	1/2	3-1/4	134825	116.16
7/32	3/8	9/16	3-1/2	134836	120.00
1/4	3/8	5/8	3-1/2	134847	120.00
9/32	3/8	11/16	3-1/2	134858	133.40
5/16	3/8	3/4	3-1/2	134869	133.40
11/32	3/8	3/4	3-1/2	134880	133.40
3/8	3/8	3/4	3-1/2	134891	133.40
7/16	1/2	7/8	4	134902	181.54
1/2	1/2	1	4	134913	197.33

NOTE: ALL TOOLS WITH WELDON FLATS

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

# Carbide Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134440	78.24
5/32	3/8	7/16	3-1/4	134451	78.24
3/16	3/8	1/2	3-1/4	134462	78.24
7/32	3/8	9/16	3-1/2	134473	79.48
1/4	3/8	5/8	3-1/2	134484	79.48
9/32	3/8	11/16	3-1/2	134495	81.50
5/16	3/8	3/4	3-1/2	134506	81.50
11/32	3/8	3/4	3-1/2	134517	81.50
3/8	3/8	3/4	3-1/2	134528	81.50
7/16	1/2	7/8	4	134539	118.15
1/2	1/2	1	4	134550	132.73

NOTE: ALL TOOLS WITH WELDON FLATS

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134561	97.67
5/32	3/8	7/16	3-1/4	134572	97.67
3/16	3/8	1/2	3-1/4	134583	97.67
7/32	3/8	9/16	3-1/2	134594	99.91
1/4	3/8	5/8	3-1/2	134605	99.91
9/32	3/8	11/16	3-1/2	134616	107.22
5/16	3/8	3/4	3-1/2	134627	107.22
11/32	3/8	3/4	3-1/2	134638	107.22
3/8	3/8	3/4	3-1/2	134649	107.22
7/16	1/2	7/8	4	134660	159.53
1/2	1/2	1	4	134671	179.22

NOTE: ALL TOOLS WITH WELDON FLATS

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	134924	88.97
5/32	3/8	7/16	3-1/4	134935	88.97
3/16	3/8	1/2	3-1/4	134946	88.97
7/32	3/8	9/16	3-1/2	134957	90.17
1/4	3/8	5/8	3-1/2	134968	90.17
9/32	3/8	11/16	3-1/2	134979	98.79
5/16	3/8	3/4	3-1/2	134990	98.79
11/32	3/8	3/4	3-1/2	135001	98.79
3/8	3/8	3/4	3-1/2	135012	98.79
7/16	1/2	7/8	4	135023	143.00
1/2	1/2	1	4	135034	146.19

NOTE: ALL TOOLS WITH WELDON FLATS

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/8	135045	116.16
5/32	3/8	7/16	3-1/4	135056	116.16
3/16	3/8	1/2	3-1/4	135067	116.16
7/32	3/8	9/16	3-1/2	135078	120.00
1/4	3/8	5/8	3-1/2	135089	120.00
9/32	3/8	11/16	3-1/2	135100	133.40
5/16	3/8	3/4	3-1/2	135111	133.40
11/32	3/8	3/4	3-1/2	135122	133.40
3/8	3/8	3/4	3-1/2	135133	133.40
7/16	1/2	7/8	4	135144	181.54
1/2	1/2	1	4	135155	197.33

NOTE: ALL TOOLS WITH WELDON FLATS

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA



## 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	50.19	222682	60.22	144956	62.72	223870	75.26
0.006	0.125	0.018	1-1/2	143779	50.19	222693	60.22	144967	62.72	223881	75.26
0.007	0.125	0.021	1-1/2	143790	50.19	222704	60.22	144978	62.72	223892	75.26
0.008	0.125	0.024	1-1/2	143801	50.19	222715	60.22	144989	62.72	223903	75.26
0.009	0.125	0.027	1-1/2	143812	44.97	222726	53.96	145000	56.24	223914	67.47
0.010	0.125	0.030	1-1/2	143823	44.97	222737	53.96	145011	56.24	223925	67.47
0.011	0.125	0.033	1-1/2	143834	40.26	222748	48.31	145022	50.32	223936	60.42
0.012	0.125	0.036	1-1/2	143845	40.26	222759	48.31	145033	50.32	223947	60.42
0.013	0.125	0.039	1-1/2	143856	33.30	222770	39.95	145044	41.69	223958	50.02
0.014	0.125	0.042	1-1/2	143867	33.30	222781	39.95	145055	41.69	223969	50.02
0.015	0.125	0.045	1-1/2	143878	28.15	222792	33.77	145066	35.17	223980	42.19
0.016	0.125	0.048	1-1/2	143889	28.15	222803	33.77	145077	35.17	223991	42.19
0.017	0.125	0.051	1-1/2	143900	28.15	222814	33.77	145088	35.17	224002	42.19
0.018	0.125	0.054	1-1/2	143911	28.15	222825	33.77	145099	35.17	224013	42.19
0.019	0.125	0.057	1-1/2	143922	28.15	222836	33.77	145110	35.17	224024	42.19
0.020	0.125	0.060	1-1/2	143933	25.58	222847	30.69	145121	32.00	224035	38.38
0.021	0.125	0.063	1-1/2	143944	25.58	222858	30.69	145132	32.00	224046	38.38
0.022	0.125	0.066	1-1/2	143955	25.58	222869	30.69	145143	32.00	224057	38.38
0.023	0.125	0.069	1-1/2	143966	25.58	222880	30.69	145154	32.00	224068	38.38
0.024	0.125	0.072	1-1/2	143977	25.58	222891	30.69	145165	32.00	224079	38.38
0.025	0.125	0.075	1-1/2	143988	25.58	222902	30.69	145176	32.00	224090	38.38
0.026	0.125	0.078	1-1/2	143999	24.01	222913	28.82	145187	30.02	224101	36.01
0.027	0.125	0.081	1-1/2	144010	24.01	222924	28.82	145198	30.02	224112	36.01
0.028	0.125	0.084	1-1/2	144021	24.01	222935	28.82	145209	30.02	224123	36.01
0.029	0.125	0.087	1-1/2	144032	24.01	222946	28.82	145220	30.02	224134	36.01
0.030	0.125	0.090	1-1/2	144043	24.01	222957	28.82	145231	30.02	224145	36.01
0.031	0.125	0.093	1-1/2	144054	22.50	222968	26.98	145242	28.15	224156	33.77
0.032	0.125	0.096	1-1/2	144065	22.50	222979	26.98	145253	28.15	224167	33.77
0.033	0.125	0.099	1-1/2	144076	22.50	222990	26.98	145264	28.15	224178	33.77
0.034	0.125	0.102	1-1/2	144087	22.50	223001	26.98	145275	28.15	224189	33.77
0.035	0.125	0.105	1-1/2	144098	22.50	223012	26.98	145286	28.15	224200	33.77
0.036	0.125	0.108	1-1/2	144109	22.50	223023	26.98	145297	28.15	224211	33.77
0.037	0.125	0.111	1-1/2	144120	22.50	223034	26.98	145308	28.15	224222	33.77
0.038	0.125	0.114	1-1/2	144131	22.50	223045	26.98	145319	28.15	224233	33.77
0.039	0.125	0.117	1-1/2	144142	22.50	223056	26.98	145330	28.15	224244	33.77
0.040	0.125	0.120	1-1/2	144153	22.50	223067	26.98	145341	28.15	224255	33.77
0.041	0.125	0.123	1-1/2	144164	22.50	223078	26.98	145352	28.15	224266	33.77
0.042	0.125	0.126	1-1/2	144175	22.50	223089	26.98	145363	28.15	224277	33.77
0.043	0.125	0.129	1-1/2	144186	22.50	223100	26.98	145374	28.15	224288	33.77
0.044	0.125	0.132	1-1/2	144197	21.93	223111	26.35	145385	27.45	224299	32.97
0.045	0.125	0.135	1-1/2	144208	21.93	223122	26.35	145396	27.45	224310	32.97
0.046	0.125	0.138	1-1/2	144219	21.93	223133	26.35	145407	27.45	224321	32.97
0.047	0.125	0.141	1-1/2	144230	21.93	223144	26.35	145418	27.45	224332	32.97
0.048	0.125	0.144	1-1/2	144241	21.93	223155	26.35	145429	27.45	224343	32.97
0.049	0.125	0.147	1-1/2	144252	21.93	223166	26.35	145440	27.45	224354	32.97
0.050	0.125	0.150	1-1/2	144263	21.93	223177	26.35	145451	27.45	224365	32.97
0.051	0.125	0.153	1-1/2	144274	21.93	223188	26.35	145462	27.45	224376	32.97
0.052	0.125	0.156	1-1/2	144285	21.93	223199	26.35	145473	27.45	224387	32.97
0.053	0.125	0.159	1-1/2	144296	21.93	223210	26.35	145484	27.45	224398	32.97
0.054	0.125	0.162	1-1/2	144307	21.93	223221	26.35	145495	27.45	224409	32.97
0.055	0.125	0.165	1-1/2	144318	21.93	223232	26.35	145506	27.45	224420	32.97
0.056	0.125	0.168	1-1/2	144329	21.93	223243	26.35	145517	27.45	224431	32.97
0.057	0.125	0.171	1-1/2	144340	21.93	223254	26.35	145528	27.45	224442	32.97
0.058	0.125	0.174	1-1/2	144351	21.93	223265	26.35	145539	27.45	224453	32.97

LENGTH OF CUT = 3 X DIAMETER. FOR COATING INFORMATION SEE PAGE 5. CONT ON NEXT PAGE

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

# Carbide Micro Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	21.93	223276	26.35	145550	27.45	224464	32.97
0.060	0.125	0.180	1-1/2	144373	21.93	223287	26.35	145561	27.45	224475	32.97
0.061	0.125	0.183	1-1/2	144384	21.93	223298	26.35	145572	27.45	224486	32.97
0.062	0.125	0.186	1-1/2	144395	21.93	223309	26.35	145583	27.45	224497	32.97
0.063	0.125	0.189	1-1/2	144406	21.93	223320	26.35	145594	27.45	224508	32.97
0.064	0.125	0.192	1-1/2	144417	21.93	223331	26.35	145605	27.45	224519	32.97
0.065	0.125	0.195	1-1/2	144428	21.93	223342	26.35	145616	27.45	224530	32.97
0.066	0.125	0.198	1-1/2	144439	21.93	223353	26.35	145627	27.45	224541	32.97
0.067	0.125	0.201	1-1/2	144450	21.93	223364	26.35	145638	27.45	224552	32.97
0.068	0.125	0.204	1-1/2	144461	21.93	223375	26.35	145649	27.45	224563	32.97
0.069	0.125	0.207	1-1/2	144472	21.93	223386	26.35	145660	27.45	224574	32.97
0.070	0.125	0.210	1-1/2	144483	21.93	223397	26.35	145671	27.45	224585	32.97
0.071	0.125	0.213	1-1/2	144494	21.93	223408	26.35	145682	27.45	224596	32.97
0.072	0.125	0.216	1-1/2	144505	21.93	223419	26.35	145693	27.45	224607	32.97
0.073	0.125	0.219	1-1/2	144516	21.93	223430	26.35	145704	27.45	224618	32.97
0.074	0.125	0.222	1-1/2	144527	21.93	223441	26.35	145715	27.45	224629	32.97
0.075	0.125	0.225	1-1/2	144538	21.93	223452	26.35	145726	27.45	224640	32.97
0.076	0.125	0.228	1-1/2	144549	21.93	223463	26.35	145737	27.45	224651	32.97
0.077	0.125	0.231	1-1/2	144560	21.93	223474	26.35	145748	27.45	224662	32.97
0.078	0.125	0.234	1-1/2	144571	21.93	223485	26.35	145759	27.45	224673	32.97
0.079	0.125	0.237	1-1/2	144582	21.93	223496	26.35	145770	27.45	224684	32.97
0.080	0.125	0.240	1-1/2	144593	21.93	223507	26.35	145781	27.45	224695	32.97
0.081	0.125	0.243	1-1/2	144604	21.93	223518	26.35	145792	27.45	224706	32.97
0.082	0.125	0.246	1-1/2	144615	21.93	223529	26.35	145803	27.45	224717	32.97
0.083	0.125	0.249	1-1/2	144626	21.93	223540	26.35	145814	27.45	224728	32.97
0.084	0.125	0.252	1-1/2	144637	21.93	223551	26.35	145825	27.45	224739	32.97
0.085	0.125	0.255	1-1/2	144648	21.93	223562	26.35	145836	27.45	224750	32.97
0.086	0.125	0.258	1-1/2	144659	21.93	223573	26.35	145847	27.45	224761	32.97
0.087	0.125	0.261	1-1/2	144670	21.93	223584	26.35	145858	27.45	224772	32.97
0.088	0.125	0.264	1-1/2	144681	21.93	223595	26.35	145869	27.45	224783	32.97
0.089	0.125	0.267	1-1/2	144692	21.93	223606	26.35	145880	27.45	224794	32.97
0.090	0.125	0.270	1-1/2	144703	21.93	223617	26.35	145891	27.45	224805	32.97
0.091	0.125	0.273	1-1/2	144714	21.93	223628	26.35	145902	27.45	224816	32.97
0.092	0.125	0.276	1-1/2	144725	21.93	223639	26.35	145913	27.45	224827	32.97
0.093	0.125	0.279	1-1/2	144736	21.93	223650	26.35	145924	27.45	224838	32.97
0.094	0.125	0.282	1-1/2	144747	21.93	223661	26.35	145935	27.45	224849	32.97
0.095	0.125	0.285	1-1/2	144758	21.93	223672	26.35	145946	27.45	224860	32.97
0.096	0.125	0.288	1-1/2	144769	21.93	223683	26.35	145957	27.45	224871	32.97
0.097	0.125	0.291	1-1/2	144780	21.93	223694	26.35	145968	27.45	224882	32.97
0.098	0.125	0.294	1-1/2	144791	21.93	223705	26.35	145979	27.45	224893	32.97
0.099	0.125	0.297	1-1/2	144802	21.93	223716	26.35	145990	27.45	224904	32.97
0.100	0.125	0.300	1-1/2	144813	21.93	223727	26.35	146001	27.45	224915	32.97
0.101	0.125	0.303	1-1/2	144824	21.93	223738	26.35	146012	27.45	224926	32.97
0.102	0.125	0.306	1-1/2	144835	21.93	223749	26.35	146023	27.45	224937	32.97
0.103	0.125	0.309	1-1/2	144846	21.93	223760	26.35	146034	27.45	224948	32.97
0.104	0.125	0.312	1-1/2	144857	21.93	223771	26.35	146045	27.45	224959	32.97
0.105	0.125	0.315	1-1/2	144868	21.93	223782	26.35	146056	27.45	224970	32.97
0.106	0.125	0.318	1-1/2	144879	21.93	223793	26.35	146067	27.45	224981	32.97
0.107	0.125	0.321	1-1/2	144890	21.93	223804	26.35	146078	27.45	224992	32.97
0.108	0.125	0.324	1-1/2	144901	21.93	223815	26.35	146089	27.45	225003	32.97
0.109	0.125	0.327	1-1/2	144912	21.93	223826	26.35	146100	27.45	225014	32.97
0.110	0.125	0.330	1-1/2	144923	21.93	223837	26.35	146111	27.45	225025	32.97
0.115	0.125	0.345	1-1/2	144934	21.93	223848	26.35	146122	27.45	225036	32.97
0.120	0.125	0.360	1-1/2	144945	21.93	223859	26.35	146133	27.45	225047	32.97

LENGTH OF CUT = 3 X DIAMETER. FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

## 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	44.97	225058	53.96	147277	56.24	226191	67.47
0.011	0.125	0.033	1-1/2	146155	40.26	225069	48.31	147288	50.32	226202	60.42
0.012	0.125	0.036	1-1/2	146166	40.26	225080	48.31	147299	50.32	226213	60.42
0.013	0.125	0.039	1-1/2	146177	33.30	225091	39.95	147310	41.69	226224	50.02
0.014	0.125	0.042	1-1/2	146188	33.30	225102	39.95	147321	41.69	226235	50.02
0.015	0.125	0.045	1-1/2	146199	28.15	225113	33.77	147332	35.17	226246	42.19
0.016	0.125	0.048	1-1/2	146210	28.15	225124	33.77	147343	35.17	226257	42.19
0.017	0.125	0.051	1-1/2	146221	28.15	225135	33.77	147354	35.17	226268	42.19
0.018	0.125	0.054	1-1/2	146232	28.15	225146	33.77	147365	35.17	226279	42.19
0.019	0.125	0.057	1-1/2	146243	28.15	225157	33.77	147376	35.17	226290	42.19
0.020	0.125	0.060	1-1/2	146254	25.58	225168	30.69	147387	32.00	226301	38.38
0.021	0.125	0.063	1-1/2	146265	25.58	225179	30.69	147398	32.00	226312	38.38
0.022	0.125	0.066	1-1/2	146276	25.58	225190	30.69	147409	32.00	226323	38.38
0.023	0.125	0.069	1-1/2	146287	25.58	225201	30.69	147420	32.00	226334	38.38
0.024	0.125	0.072	1-1/2	146298	25.58	225212	30.69	147431	32.00	226345	38.38
0.025	0.125	0.075	1-1/2	146309	25.58	225223	30.69	147442	32.00	226356	38.38
0.026	0.125	0.078	1-1/2	146320	24.01	225234	28.82	147453	30.02	226367	36.01
0.027	0.125	0.081	1-1/2	146331	24.01	225245	28.82	147464	30.02	226378	36.01
0.028	0.125	0.084	1-1/2	146342	24.01	225256	28.82	147475	30.02	226389	36.01
0.029	0.125	0.087	1-1/2	146353	24.01	225267	28.82	147486	30.02	226400	36.01
0.030	0.125	0.090	1-1/2	146364	24.01	225278	28.82	147497	30.02	226411	36.01
0.031	0.125	0.093	1-1/2	146375	22.50	225289	26.98	147508	28.15	226422	33.77
0.032	0.125	0.096	1-1/2	146386	22.50	225300	26.98	147519	28.15	226433	33.77
0.033	0.125	0.099	1-1/2	146397	22.50	225311	26.98	147530	28.15	226444	33.77
0.034	0.125	0.102	1-1/2	146408	22.50	225322	26.98	147541	28.15	226455	33.77
0.035	0.125	0.105	1-1/2	146419	22.50	225333	26.98	147552	28.15	226466	33.77
0.036	0.125	0.108	1-1/2	146430	22.50	225344	26.98	147563	28.15	226477	33.77
0.037	0.125	0.111	1-1/2	146441	22.50	225355	26.98	147574	28.15	226488	33.77
0.038	0.125	0.114	1-1/2	146452	22.50	225366	26.98	147585	28.15	226499	33.77
0.039	0.125	0.117	1-1/2	146463	22.50	225377	26.98	147596	28.15	226510	33.77
0.040	0.125	0.120	1-1/2	146474	22.50	225388	26.98	147607	28.15	226521	33.77
0.041	0.125	0.123	1-1/2	146485	22.50	225399	26.98	147618	28.15	226532	33.77
0.042	0.125	0.126	1-1/2	146496	22.50	225410	26.98	147629	28.15	226543	33.77
0.043	0.125	0.129	1-1/2	146507	22.50	225421	26.98	147640	28.15	226554	33.77
0.044	0.125	0.132	1-1/2	146518	21.93	225432	26.35	147651	27.45	226565	32.97
0.045	0.125	0.135	1-1/2	146529	21.93	225443	26.35	147662	27.45	226576	32.97
0.046	0.125	0.138	1-1/2	146540	21.93	225454	26.35	147673	27.45	226587	32.97
0.047	0.125	0.141	1-1/2	146551	21.93	225465	26.35	147684	27.45	226598	32.97
0.048	0.125	0.144	1-1/2	146562	21.93	225476	26.35	147695	27.45	226609	32.97
0.049	0.125	0.147	1-1/2	146573	21.93	225487	26.35	147706	27.45	226620	32.97
0.050	0.125	0.150	1-1/2	146584	21.93	225498	26.35	147717	27.45	226631	32.97
0.051	0.125	0.153	1-1/2	146595	21.93	225509	26.35	147728	27.45	226642	32.97
0.052	0.125	0.156	1-1/2	146606	21.93	225520	26.35	147739	27.45	226653	32.97
0.053	0.125	0.159	1-1/2	146617	21.93	225531	26.35	147750	27.45	226664	32.97
0.054	0.125	0.162	1-1/2	146628	21.93	225542	26.35	147761	27.45	226675	32.97
0.055	0.125	0.165	1-1/2	146639	21.93	225553	26.35	147772	27.45	226686	32.97
0.056	0.125	0.168	1-1/2	146650	21.93	225564	26.35	147783	27.45	226697	32.97
0.057	0.125	0.171	1-1/2	146661	21.93	225575	26.35	147794	27.45	226708	32.97
0.058	0.125	0.174	1-1/2	146672	21.93	225586	26.35	147805	27.45	226719	32.97

CONTINUED ON NEXT PAGE

**LENGTH OF CUT = 3 X DIAMETER  
FOR COATING INFORMATION SEE PAGE 5.**

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

# Carbide Micro Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	21.93	225597	26.35	147816	27.45	226730	32.97
0.060	0.125	0.180	1-1/2	146694	21.93	225608	26.35	147827	27.45	226741	32.97
0.061	0.125	0.183	1-1/2	146705	21.93	225619	26.35	147838	27.45	226752	32.97
0.062	0.125	0.186	1-1/2	146716	21.93	225630	26.35	147849	27.45	226763	32.97
0.063	0.125	0.189	1-1/2	146727	21.93	225641	26.35	147860	27.45	226774	32.97
0.064	0.125	0.192	1-1/2	146738	21.93	225652	26.35	147871	27.45	226785	32.97
0.065	0.125	0.195	1-1/2	146749	21.93	225663	26.35	147882	27.45	226796	32.97
0.066	0.125	0.198	1-1/2	146760	21.93	225674	26.35	147893	27.45	226807	32.97
0.067	0.125	0.201	1-1/2	146771	21.93	225685	26.35	147904	27.45	226818	32.97
0.068	0.125	0.204	1-1/2	146782	21.93	225696	26.35	147915	27.45	226829	32.97
0.069	0.125	0.207	1-1/2	146793	21.93	225707	26.35	147926	27.45	226840	32.97
0.070	0.125	0.210	1-1/2	146804	21.93	225718	26.35	147937	27.45	226851	32.97
0.071	0.125	0.213	1-1/2	146815	21.93	225729	26.35	147948	27.45	226862	32.97
0.072	0.125	0.216	1-1/2	146826	21.93	225740	26.35	147959	27.45	226873	32.97
0.073	0.125	0.219	1-1/2	146837	21.93	225751	26.35	147970	27.45	226884	32.97
0.074	0.125	0.222	1-1/2	146848	21.93	225762	26.35	147981	27.45	226895	32.97
0.075	0.125	0.225	1-1/2	146859	21.93	225773	26.35	147992	27.45	226906	32.97
0.076	0.125	0.228	1-1/2	146870	21.93	225784	26.35	148003	27.45	226917	32.97
0.077	0.125	0.231	1-1/2	146881	21.93	225795	26.35	148014	27.45	226928	32.97
0.078	0.125	0.234	1-1/2	146892	21.93	225806	26.35	148025	27.45	226939	32.97
0.079	0.125	0.237	1-1/2	146903	21.93	225817	26.35	148036	27.45	226950	32.97
0.080	0.125	0.240	1-1/2	146914	21.93	225828	26.35	148047	27.45	226961	32.97
0.081	0.125	0.243	1-1/2	146925	21.93	225839	26.35	148058	27.45	226972	32.97
0.082	0.125	0.246	1-1/2	146936	21.93	225850	26.35	148069	27.45	226983	32.97
0.083	0.125	0.249	1-1/2	146947	21.93	225861	26.35	148080	27.45	226994	32.97
0.084	0.125	0.252	1-1/2	146958	21.93	225872	26.35	148091	27.45	227005	32.97
0.085	0.125	0.255	1-1/2	146969	21.93	225883	26.35	148102	27.45	227016	32.97
0.086	0.125	0.258	1-1/2	146980	21.93	225894	26.35	148113	27.45	227027	32.97
0.087	0.125	0.261	1-1/2	146991	21.93	225905	26.35	148124	27.45	227038	32.97
0.088	0.125	0.264	1-1/2	147002	21.93	225916	26.35	148135	27.45	227049	32.97
0.089	0.125	0.267	1-1/2	147013	21.93	225927	26.35	148146	27.45	227060	32.97
0.090	0.125	0.270	1-1/2	147024	21.93	225938	26.35	148157	27.45	227071	32.97
0.091	0.125	0.273	1-1/2	147035	21.93	225949	26.35	148168	27.45	227082	32.97
0.092	0.125	0.276	1-1/2	147046	21.93	225960	26.35	148179	27.45	227093	32.97
0.093	0.125	0.279	1-1/2	147057	21.93	225971	26.35	148190	27.45	227104	32.97
0.094	0.125	0.282	1-1/2	147068	21.93	225982	26.35	148201	27.45	227115	32.97
0.095	0.125	0.285	1-1/2	147079	21.93	225993	26.35	148212	27.45	227126	32.97
0.096	0.125	0.288	1-1/2	147090	21.93	226004	26.35	148223	27.45	227137	32.97
0.097	0.125	0.291	1-1/2	147101	21.93	226015	26.35	148234	27.45	227148	32.97
0.098	0.125	0.294	1-1/2	147112	21.93	226026	26.35	148245	27.45	227159	32.97
0.099	0.125	0.297	1-1/2	147123	21.93	226037	26.35	148256	27.45	227170	32.97
0.100	0.125	0.300	1-1/2	147134	21.93	226048	26.35	148267	27.45	227181	32.97
0.101	0.125	0.303	1-1/2	147145	21.93	226059	26.35	148278	27.45	227192	32.97
0.102	0.125	0.306	1-1/2	147156	21.93	226070	26.35	148289	27.45	227203	32.97
0.103	0.125	0.309	1-1/2	147167	21.93	226081	26.35	148300	27.45	227214	32.97
0.104	0.125	0.312	1-1/2	147178	21.93	226092	26.35	148311	27.45	227225	32.97
0.105	0.125	0.315	1-1/2	147189	21.93	226103	26.35	148322	27.45	227236	32.97
0.106	0.125	0.318	1-1/2	147200	21.93	226114	26.35	148333	27.45	227247	32.97
0.107	0.125	0.321	1-1/2	147211	21.93	226125	26.35	148344	27.45	227258	32.97
0.108	0.125	0.324	1-1/2	147222	21.93	226136	26.35	148355	27.45	227269	32.97
0.109	0.125	0.327	1-1/2	147233	21.93	226147	26.35	148366	27.45	227280	32.97
0.110	0.125	0.330	1-1/2	147244	21.93	226158	26.35	148377	27.45	227291	32.97
0.115	0.125	0.345	1-1/2	147255	21.93	226169	26.35	148388	27.45	227302	32.97
0.120	0.125	0.360	1-1/2	147266	21.93	226180	26.35	148399	27.45	227313	32.97

LENGTH OF CUT = 3 X DIAMETER. FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



## 2 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
0.005	0.125	0.008	1-1/2	220526	57.71	220801	69.24	221076	72.12	221351	86.56
0.010	0.125	0.015	1-1/2	220537	51.72	220812	62.05	221087	64.66	221362	77.57
0.015	0.125	0.023	1-1/2	220548	32.36	220823	38.85	221098	40.46	221373	48.55
0.020	0.125	0.030	1-1/2	220559	29.42	220834	35.31	221109	36.78	221384	44.13
0.025	0.125	0.038	1-1/2	220570	29.42	220845	35.31	221120	36.78	221395	44.13
0.030	0.125	0.045	1-1/2	220581	27.62	220856	33.13	221131	34.50	221406	41.39
0.031	0.125	0.047	1-1/2	220592	25.88	220867	31.03	221142	32.36	221417	38.85
0.035	0.125	0.053	1-1/2	220603	25.88	220878	31.03	221153	32.36	221428	38.85
0.040	0.125	0.060	1-1/2	220614	25.88	220889	31.03	221164	32.36	221439	38.85
0.045	0.125	0.068	1-1/2	220625	25.24	220900	30.29	221175	31.56	221450	37.91
0.047	0.125	0.071	1-1/2	220636	25.24	220911	30.29	221186	31.56	221461	37.91
0.050	0.125	0.075	1-1/2	220647	25.24	220922	30.29	221197	31.56	221472	37.91
0.055	0.125	0.083	1-1/2	220658	25.24	220933	30.29	221208	31.56	221483	37.91
0.060	0.125	0.090	1-1/2	220669	25.24	220944	30.29	221219	31.56	221494	37.91
0.062	0.125	0.093	1-1/2	220680	25.24	220955	30.29	221230	31.56	221505	37.91
0.065	0.125	0.098	1-1/2	220691	25.24	220966	30.29	221241	31.56	221516	37.91
0.070	0.125	0.105	1-1/2	220702	25.24	220977	30.29	221252	31.56	221527	37.91
0.075	0.125	0.113	1-1/2	220713	25.24	220988	30.29	221263	31.56	221538	37.91
0.078	0.125	0.117	1-1/2	220724	25.24	220999	30.29	221274	31.56	221549	37.91
0.080	0.125	0.120	1-1/2	220735	25.24	221010	30.29	221285	31.56	221560	37.91
0.085	0.125	0.128	1-1/2	220746	25.24	221021	30.29	221296	31.56	221571	37.91
0.090	0.125	0.135	1-1/2	220757	25.24	221032	30.29	221307	31.56	221582	37.91
0.093	0.125	0.140	1-1/2	220768	25.24	221043	30.29	221318	31.56	221593	37.91
0.095	0.125	0.143	1-1/2	220779	25.24	221054	30.29	221329	31.56	221604	37.91
0.100	0.125	0.150	1-1/2	220790	25.24	221065	30.29	221340	31.56	221615	37.91

LENGTH OF CUT = 1.5 X DIAMETER  
FOR COATING INFORMATION SEE PAGE 5.

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

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



# Carbide Micro Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	51.72	221890	62.05	222154	56.24	222418	77.57
0.015	0.125	0.023	1-1/2	221637	32.36	221901	38.85	222165	35.17	222429	48.55
0.020	0.125	0.030	1-1/2	221648	29.42	221912	35.31	222176	32.00	222440	44.13
0.025	0.125	0.038	1-1/2	221659	29.42	221923	35.31	222187	32.00	222451	44.13
0.030	0.125	0.045	1-1/2	221670	27.62	221934	33.13	222198	30.02	222462	41.39
0.031	0.125	0.047	1-1/2	221681	25.88	221945	31.03	222209	28.15	222473	38.85
0.035	0.125	0.053	1-1/2	221692	25.88	221956	31.03	222220	28.15	222484	38.85
0.040	0.125	0.060	1-1/2	221703	25.88	221967	31.03	222231	28.15	222495	38.85
0.045	0.125	0.068	1-1/2	221714	25.24	221978	30.29	222242	27.45	222506	37.91
0.047	0.125	0.071	1-1/2	221725	25.24	221989	30.29	222253	27.45	222517	37.91
0.050	0.125	0.075	1-1/2	221736	25.24	222000	30.29	222264	27.45	222528	37.91
0.055	0.125	0.083	1-1/2	221747	25.24	222011	30.29	222275	27.45	222539	37.91
0.060	0.125	0.090	1-1/2	221758	25.24	222022	30.29	222286	27.45	222550	37.91
0.062	0.125	0.093	1-1/2	221769	25.24	222033	30.29	222297	27.45	222561	37.91
0.065	0.125	0.098	1-1/2	221780	25.24	222044	30.29	222308	27.45	222572	37.91
0.070	0.125	0.105	1-1/2	221791	25.24	222055	30.29	222319	27.45	222583	37.91
0.075	0.125	0.113	1-1/2	221802	25.24	222066	30.29	222330	27.45	222594	37.91
0.078	0.125	0.117	1-1/2	221813	25.24	222077	30.29	222341	27.45	222605	37.91
0.080	0.125	0.120	1-1/2	221824	25.24	222088	30.29	222352	27.45	222616	37.91
0.085	0.125	0.128	1-1/2	221835	25.24	222099	30.29	222363	27.45	222627	37.91
0.090	0.125	0.135	1-1/2	221846	25.24	222110	30.29	222374	27.45	222638	37.91
0.093	0.125	0.140	1-1/2	221857	25.24	222121	30.29	222385	27.45	222649	37.91
0.095	0.125	0.143	1-1/2	221868	25.24	222132	30.29	222396	27.45	222660	37.91
0.100	0.125	0.150	1-1/2	221879	25.24	222143	30.29	222407	27.45	222671	37.91

LENGTH OF CUT = 1.5 X DIAMETER  
FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

**4 FLUTE - STUB FLUTE -  CORNER RADIUS - 30° HELIX**



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
0.015	0.125	0.023	1-1/2	0.003	218722	68.44	219173	84.86
0.020	0.125	0.030	1-1/2	0.005	218733	63.89	219184	79.21
0.025	0.125	0.038	1-1/2	0.005	218744	63.89	219195	79.21
0.030	0.125	0.045	1-1/2	0.005	218755	45.64	219206	56.57
0.030	0.125	0.045	1-1/2	0.010	218766	45.64	219217	56.57
0.031	0.125	0.047	1-1/2	0.005	218777	45.64	219228	56.57
0.031	0.125	0.047	1-1/2	0.010	218788	45.64	219239	56.57
0.035	0.125	0.053	1-1/2	0.005	218799	45.64	219250	56.57
0.035	0.125	0.053	1-1/2	0.010	218810	45.64	219261	56.57
0.040	0.125	0.060	1-1/2	0.005	218821	45.64	219272	56.57
0.040	0.125	0.060	1-1/2	0.010	218832	45.64	219283	56.57
0.045	0.125	0.068	1-1/2	0.005	218843	45.64	219294	56.57
0.045	0.125	0.068	1-1/2	0.010	218854	45.64	219305	56.57
0.045	0.125	0.068	1-1/2	0.015	218865	45.64	219316	56.57
0.047	0.125	0.071	1-1/2	0.005	218876	45.64	219327	56.57
0.047	0.125	0.071	1-1/2	0.010	218887	45.64	219338	56.57
0.047	0.125	0.071	1-1/2	0.015	218898	45.64	219349	56.57
0.050	0.125	0.075	1-1/2	0.005	218909	45.64	219360	56.57
0.050	0.125	0.075	1-1/2	0.010	218920	45.64	219371	56.57
0.050	0.125	0.075	1-1/2	0.015	218931	45.64	219382	56.57
0.060	0.125	0.090	1-1/2	0.005	218942	45.64	219393	56.57
0.060	0.125	0.090	1-1/2	0.010	218953	45.64	219404	56.57
0.060	0.125	0.090	1-1/2	0.015	218964	45.64	219415	56.57
0.062	0.125	0.093	1-1/2	0.005	218975	45.64	219426	56.57
0.062	0.125	0.093	1-1/2	0.010	218986	45.64	219437	56.57
0.062	0.125	0.093	1-1/2	0.015	218997	45.64	219448	56.57
0.075	0.125	0.113	1-1/2	0.005	219008	45.64	219459	56.57
0.075	0.125	0.113	1-1/2	0.010	219019	45.64	219470	56.57
0.075	0.125	0.113	1-1/2	0.015	219030	45.64	219481	56.57
0.078	0.125	0.117	1-1/2	0.005	219041	45.64	219492	56.57
0.078	0.125	0.117	1-1/2	0.010	219052	45.64	219503	56.57
0.078	0.125	0.117	1-1/2	0.015	219063	45.64	219514	56.57
0.090	0.125	0.135	1-1/2	0.005	219074	45.64	219525	56.57
0.090	0.125	0.135	1-1/2	0.010	219085	45.64	219536	56.57
0.090	0.125	0.135	1-1/2	0.015	219096	45.64	219547	56.57
0.093	0.125	0.140	1-1/2	0.005	219107	45.64	219558	56.57
0.093	0.125	0.140	1-1/2	0.010	219118	45.64	219569	56.57
0.093	0.125	0.140	1-1/2	0.015	219129	45.64	219580	56.57
0.100	0.125	0.150	1-1/2	0.005	219140	45.64	219591	56.57
0.100	0.125	0.150	1-1/2	0.010	219151	45.64	219602	56.57
0.100	0.125	0.150	1-1/2	0.015	219162	45.64	219613	56.57

**LENGTH OF CUT = 1.5 X DIAMETER  
FOR COATING INFORMATION SEE PAGE 5.**

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

# Carbide Micro Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 4 FLUTE - CORNER RADIUS - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	CORNER RADIUS	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
0.015	0.125	0.045	1-1/2	0.003	219624	68.44	220075	84.86
0.020	0.125	0.060	1-1/2	0.005	219635	63.89	220086	79.21
0.025	0.125	0.075	1-1/2	0.005	219646	63.89	220097	79.21
0.030	0.125	0.090	1-1/2	0.005	219657	45.64	220108	56.57
0.030	0.125	0.090	1-1/2	0.010	219668	45.64	220119	56.57
0.031	0.125	0.093	1-1/2	0.005	219679	45.64	220130	56.57
0.031	0.125	0.093	1-1/2	0.010	219690	45.64	220141	56.57
0.035	0.125	0.105	1-1/2	0.005	219701	45.64	220152	56.57
0.035	0.125	0.105	1-1/2	0.010	219712	45.64	220163	56.57
0.040	0.125	0.120	1-1/2	0.005	219723	45.64	220174	56.57
0.040	0.125	0.120	1-1/2	0.010	219734	45.64	220185	56.57
0.045	0.125	0.135	1-1/2	0.005	219745	45.64	220196	56.57
0.045	0.125	0.135	1-1/2	0.010	219756	45.64	220207	56.57
0.045	0.125	0.135	1-1/2	0.015	219767	45.64	220218	56.57
0.047	0.125	0.141	1-1/2	0.005	219778	45.64	220229	56.57
0.047	0.125	0.141	1-1/2	0.010	219789	45.64	220240	56.57
0.047	0.125	0.141	1-1/2	0.015	219800	45.64	220251	56.57
0.050	0.125	0.150	1-1/2	0.005	219811	45.64	220262	56.57
0.050	0.125	0.150	1-1/2	0.010	219822	45.64	220273	56.57
0.050	0.125	0.150	1-1/2	0.015	219833	45.64	220284	56.57
0.060	0.125	0.180	1-1/2	0.005	219844	45.64	220295	56.57
0.060	0.125	0.180	1-1/2	0.010	219855	45.64	220306	56.57
0.060	0.125	0.180	1-1/2	0.015	219866	45.64	220317	56.57
0.062	0.125	0.186	1-1/2	0.005	219877	45.64	220328	56.57
0.062	0.125	0.186	1-1/2	0.010	219888	45.64	220339	56.57
0.062	0.125	0.186	1-1/2	0.015	219899	45.64	220350	56.57
0.075	0.125	0.225	1-1/2	0.005	219910	45.64	220361	56.57
0.075	0.125	0.225	1-1/2	0.010	219921	45.64	220372	56.57
0.075	0.125	0.225	1-1/2	0.015	219932	45.64	220383	56.57
0.078	0.125	0.234	1-1/2	0.005	219943	45.64	220394	56.57
0.078	0.125	0.234	1-1/2	0.010	219954	45.64	220405	56.57
0.078	0.125	0.234	1-1/2	0.015	219965	45.64	220416	56.57
0.090	0.125	0.270	1-1/2	0.005	219976	45.64	220427	56.57
0.090	0.125	0.270	1-1/2	0.010	219987	45.64	220438	56.57
0.090	0.125	0.270	1-1/2	0.015	219998	45.64	220449	56.57
0.093	0.125	0.279	1-1/2	0.005	220009	45.64	220460	56.57
0.093	0.125	0.279	1-1/2	0.010	220020	45.64	220471	56.57
0.093	0.125	0.279	1-1/2	0.015	220031	45.64	220482	56.57
0.100	0.125	0.300	1-1/2	0.005	220042	45.64	220493	56.57
0.100	0.125	0.300	1-1/2	0.010	220053	45.64	220504	56.57
0.100	0.125	0.300	1-1/2	0.015	220064	45.64	220515	56.57

LENGTH OF CUT = 3.0 X DIAMETER  
FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

71

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

## INTERNAL / EXTERNAL - UN THREADS



ALTIN COATED

## INTERNAL / EXTERNAL - UN THREADS COOLANT END FED



ALTIN COATED



END VIEW

SIZE	SHANK DIA.	CUTTING DIA.	THREAD LENGTH	OVERALL LENGTH	# OF FLTS	ITEM#	LIST PRICE	COOLANT FED ITEM#	LIST PRICE
6 - 32	1/8	0.100	0.218	2	3	156253	171.47	-	-
8 - 32	1/8	0.115	0.250	2	3	156264	171.47	-	-
8 - 36	1/8	0.115	0.250	2	3	156275	171.47	-	-
10 - 24	3/16	0.120	0.312	2	3	156286	171.47	-	-
10 - 32	3/16	0.120	0.312	2	3	156297	171.47	262521	199.00
1/4 - 20	3/16	0.180	0.500	2-1/2	3	156308	193.94	262532	210.00
1/4 - 28	3/16	0.180	0.500	2-1/2	3	156319	193.94	262543	210.00
5/16 - 18	1/4	0.240	0.625	2-1/2	3	156330	228.22	262554	260.00
5/16 - 24	1/4	0.240	0.625	2-1/2	3	156341	228.22	262565	260.00
3/8 - 16	5/16	0.290	0.750	3	4	156352	271.94	262576	322.00
3/8 - 24	5/16	0.290	0.750	3	4	156363	271.94	262587	322.00
7/16 - 14	3/8	0.340	0.875	3	4	156374	293.26	262598	375.00
7/16 - 20	3/8	0.340	0.875	3	4	156385	293.26	262609	375.00
1/2 - 13	3/8	0.350	0.875	3-1/2	4	156396	293.26	262620	389.00
1/2 - 20	3/8	0.350	0.875	3-1/2	4	156407	293.26	262631	389.00
9/16 - 12	1/2	0.370	0.875	3-1/2	4	156418	293.26	-	-
9/16 - 18	1/2	0.370	0.875	3-1/2	4	156429	293.26	-	-
5/8 - 11	1/2	0.470	1.250	3-1/2	5	156440	366.56	-	-
5/8 - 18	1/2	0.470	1.250	3-1/2	5	156451	366.56	-	-
3/4 - 10	1/2	0.495	1.250	3-1/2	5	156462	366.56	262642*	499.00
3/4 - 16	1/2	0.495	1.250	3-1/2	5	156473	366.56	262653*	499.00
7/8 - 9	5/8	0.620	1.250	3-1/2	5	156484	458.80	-	-
7/8 - 14	5/8	0.620	1.250	3-1/2	5	156495	458.80	-	-
1 - 8	3/4	0.620	1.375	4	5	156506	458.80	-	-
1 - 12	3/4	0.620	1.375	4	5	156517	458.80	-	-

\*THESE COOLANT FED THREADMILLS ARE AVAILABLE ONLY IN 4 FLUTE

## INTERNAL / EXTERNAL - NPT 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	156528	228.22
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156539	228.22
1/4 - 18	3/8	0.370	0.625	3	4	156550	260.13
3/8 - 18	3/8	0.370	0.625	3	4	156561	260.13
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156572	366.56
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156583	366.56
1 - 11-1/2	3/4	0.620	1.125	4	5	156594	458.80

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

THREADMILL CUTTING DIAMETER TOLERANCE

+ .000, -.002

# Carbide Threadmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	228.22
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156616	228.22
1/4 - 18	3/8	0.370	0.625	3	4	156627	260.13
3/8 - 18	3/8	0.370	0.625	3	4	156638	260.13
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156649	366.56
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156660	366.56
1 - 11-1/2	3/4	0.620	1.125	4	5	156671	458.80

## 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	175.01
M4.5 x 0.75	1/8	0.120	0.250	2	3	156693	175.01
M5 x 0.80	3/16	0.120	0.312	2	3	156704	175.01
M6 x 1.00	3/16	0.170	0.500	2-1/2	3	156715	192.75
M8 x 0.75	1/4	0.235	0.625	2-1/2	3	156726	228.22
M8 x 1.00	1/4	0.235	0.625	2-1/2	3	156737	228.22
M8 x 1.25	1/4	0.235	0.625	2-1/2	3	156748	228.22
M10 x 1.25	5/16	0.300	0.750	3	4	156759	271.94
M10 x 1.50	5/16	0.300	0.750	3	4	156770	271.94
M12 x 1.00	3/8	0.360	0.875	3-1/2	4	156781	294.41
M12 x 1.25	3/8	0.360	0.875	3-1/2	4	156792	294.41
M12 x 1.75	3/8	0.360	0.875	3-1/2	4	156803	294.41
M14 x 1.50	3/8	0.360	0.875	3-1/2	4	156814	294.41
M16 x 2.00	1/2	0.470	1.250	3-1/2	5	156825	366.56
M18 x 2.50	1/2	0.470	1.250	3-1/2	5	156836	366.56
M20 x 3.00	5/8	0.470	1.250	3-1/2	5	156847	366.56

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

THREADMILL CUTTING DIAMETER TOLERANCE

+0.000, -0.002

MADE IN USA

73

ENDMILLS

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



## 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	23.31
1/16	1/8	3/16	1-1/2	2	242045	23.31
3/32	1/8	3/8	1-1/2	2	242056	23.31
1/8	1/8	1/2	1-1/2	2	242067	22.36
3/16	3/16	5/8	2	2	242078	31.48
1/4	1/4	3/4	2-1/2	2	242089	39.39
5/16	5/16	13/16	2-1/2	2	242100	48.91
3/8	3/8	1	2-1/2	2	242111	61.46
7/16	7/16	1	2-3/4	2	242122	83.08
1/2	1/2	1	3	2	242133	101.87
5/8	5/8	1-1/4	3-1/2	2	242144	194.51
3/4	3/4	1-1/2	4	2	242155	286.49



**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	29.14
1/16	1/8	3/16	1-1/2	2	242177	29.14
3/32	1/8	3/8	1-1/2	2	242188	29.14
1/8	1/8	1/2	1-1/2	2	242199	27.97
3/16	3/16	5/8	2	2	242210	39.35
1/4	1/4	3/4	2-1/2	2	242221	49.24
5/16	5/16	13/16	2-1/2	2	242232	61.13
3/8	3/8	1	2-1/2	2	242243	76.85
7/16	7/16	1	2-3/4	2	242254	103.87
1/2	1/2	1	3	2	242265	127.36
5/8	5/8	1-1/4	3-1/2	2	242276	243.16
3/4	3/4	1-1/2	4	2	242287	358.13

**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**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	23.31
1/16	1/8	3/16	1-1/2	4	242639	23.31
3/32	1/8	3/8	1-1/2	4	242650	23.31
1/8	1/8	1/2	1-1/2	4	242661	22.36
3/16	3/16	5/8	2	4	242672	31.48
1/4	1/4	3/4	2-1/2	4	242683	39.39
5/16	5/16	13/16	2-1/2	4	242694	48.91
3/8	3/8	1	2-1/2	4	242705	61.46
7/16	7/16	1	2-3/4	4	242716	83.08
1/2	1/2	1	3	4	242727	101.87
5/8	5/8	1-1/4	3-1/2	4	242738	194.51
3/4	3/4	1-1/2	4	4	242749	286.49



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	29.14
1/16	1/8	3/16	1-1/2	4	242771	29.14
3/32	1/8	3/8	1-1/2	4	242782	29.14
1/8	1/8	1/2	1-1/2	4	242793	27.97
3/16	3/16	5/8	2	4	242804	39.35
1/4	1/4	3/4	2-1/2	4	242815	49.24
5/16	5/16	13/16	2-1/2	4	242826	61.13
3/8	3/8	1	2-1/2	4	242837	76.85
7/16	7/16	1	2-3/4	4	242848	103.87
1/2	1/2	1	3	4	242859	127.36
5/8	5/8	1-1/4	3-1/2	4	242870	243.16
3/4	3/4	1-1/2	4	4	242881	358.13

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

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

75

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

## 2 FLUTE - 90° POINT - 30° HELIX



**UNCOATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
<b>1/32</b>	1/8	1/8	1-1/2	2	<a href="#">241545</a>	23.31
<b>1/16</b>	1/8	3/16	1-1/2	2	<a href="#">241550</a>	23.31
<b>3/32</b>	1/8	3/8	1-1/2	2	<a href="#">241561</a>	23.31
<b>1/8</b>	1/8	1/2	1-1/2	2	<a href="#">241572</a>	22.36
<b>3/16</b>	3/16	5/8	2	2	<a href="#">241583</a>	31.48
<b>1/4</b>	1/4	3/4	2-1/2	2	<a href="#">241594</a>	39.39
<b>5/16</b>	5/16	13/16	2-1/2	2	<a href="#">241605</a>	48.91
<b>3/8</b>	3/8	1	2-1/2	2	<a href="#">241616</a>	61.46
<b>7/16</b>	7/16	1	2-3/4	2	<a href="#">241627</a>	83.08
<b>1/2</b>	1/2	1	3	2	<a href="#">241638</a>	101.87
<b>5/8</b>	5/8	1-1/4	3-1/2	2	<a href="#">241649</a>	194.51
<b>3/4</b>	3/4	1-1/2	4	2	<a href="#">241660</a>	286.49



**ALTIN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
<b>1/32</b>	1/8	1/8	1-1/2	2	<a href="#">241668</a>	29.14
<b>1/16</b>	1/8	3/16	1-1/2	2	<a href="#">241671</a>	29.14
<b>3/32</b>	1/8	3/8	1-1/2	2	<a href="#">241682</a>	29.14
<b>1/8</b>	1/8	1/2	1-1/2	2	<a href="#">241693</a>	27.97
<b>3/16</b>	3/16	5/8	2	2	<a href="#">241704</a>	39.35
<b>1/4</b>	1/4	3/4	2-1/2	2	<a href="#">241715</a>	49.24
<b>5/16</b>	5/16	13/16	2-1/2	2	<a href="#">241726</a>	61.13
<b>3/8</b>	3/8	1	2-1/2	2	<a href="#">241737</a>	76.85
<b>7/16</b>	7/16	1	2-3/4	2	<a href="#">241748</a>	103.87
<b>1/2</b>	1/2	1	3	2	<a href="#">241759</a>	127.36
<b>5/8</b>	5/8	1-1/4	3-1/2	2	<a href="#">241770</a>	243.16
<b>3/4</b>	3/4	1-1/2	4	2	<a href="#">241781</a>	358.13

**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**

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

# Carbide Drill Mills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	23.31
1/16	1/8	3/16	1-1/2	4	241792	23.31
3/32	1/8	3/8	1-1/2	4	241803	23.31
1/8	1/8	1/2	1-1/2	4	241814	22.36
3/16	3/16	5/8	2	4	241825	31.48
1/4	1/4	3/4	2-1/2	4	241836	39.39
5/16	5/16	13/16	2-1/2	4	241847	48.91
3/8	3/8	1	2-1/2	4	241858	61.46
7/16	7/16	1	2-3/4	4	241869	83.08
1/2	1/2	1	3	4	241880	101.87
5/8	5/8	1-1/4	3-1/2	4	241891	194.51
3/4	3/4	1-1/2	4	4	241902	286.49



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	29.14
1/16	1/8	3/16	1-1/2	4	241913	29.14
3/32	1/8	3/8	1-1/2	4	241924	29.14
1/8	1/8	1/2	1-1/2	4	241935	27.97
3/16	3/16	5/8	2	4	241946	39.35
1/4	1/4	3/4	2-1/2	4	241957	49.24
5/16	5/16	13/16	2-1/2	4	241968	61.13
3/8	3/8	1	2-1/2	4	241979	76.85
7/16	7/16	1	2-3/4	4	241990	103.87
1/2	1/2	1	3	4	242001	127.36
5/8	5/8	1-1/4	3-1/2	4	242012	243.16
3/4	3/4	1-1/2	4	4	242023	358.13

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

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

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

MADE IN USA

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



**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	19.96
1/4	1/4	2-1/2	1	252520	252564	252608	252652	252696	35.14
3/8	3/8	2-1/2	1	252531	252575	252619	252663	252707	54.82
1/2	1/2	3	1	252542	252586	252630	252674	252718	90.75



**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	24.97
1/4	1/4	2-1/2	1	252740	252784	252828	252872	252916	43.86
3/8	3/8	2-1/2	1	252751	252795	252839	252883	252927	68.54
1/2	1/2	3	1	252762	252806	252850	252894	252938	113.52



**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	19.96
1/4	1/4	2-1/2	1	252960	253004	253048	253092	253136	35.14
3/8	3/8	2-1/2	1	252971	253015	253059	253103	253147	54.82
1/2	1/2	3	1	252982	253026	253070	253114	253158	90.75



**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	24.97
1/4	1/4	2-1/2	1	253180	253224	253268	253312	253356	43.86
3/8	3/8	2-1/2	1	253191	253235	253279	253323	253367	68.54
1/2	1/2	3	1	253202	253246	253290	253334	253378	113.52

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.



# Carbide Chamfer Mills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**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	35.93
3/16	3/16	2-1/2	1	253400	253466	253532	253598	253664	49.48
1/4	1/4	2-1/2	1	253411	253477	253543	253609	253675	63.26
5/16	5/16	2-1/2	1	253422	253488	253554	253620	253686	80.97
3/8	3/8	2-1/2	1	253433	253499	253565	253631	253697	98.68
1/2	1/2	3	1	253444	253510	253576	253642	253708	163.35



**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	44.94
3/16	3/16	2-1/2	1	253730	253796	253862	253928	253994	61.85
1/4	1/4	2-1/2	1	253741	253807	253873	253939	254005	78.94
5/16	5/16	2-1/2	1	253752	253818	253884	253950	254016	101.15
3/8	3/8	2-1/2	1	253763	253829	253895	253961	254027	123.48
1/2	1/2	3	1	253774	253840	253906	253972	254038	204.39



**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	35.93
3/16	3/16	2-1/2	1	254060	254126	254192	254258	254324	49.48
1/4	1/4	2-1/2	1	254071	254137	254203	254269	254335	63.26
5/16	5/16	2-1/2	1	254082	254148	254214	254280	254346	80.97
3/8	3/8	2-1/2	1	254093	254159	254225	254291	254357	98.68
1/2	1/2	3	1	254104	254170	254236	254302	254368	163.35



**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	44.94
3/16	3/16	2-1/2	1	254390	254456	254522	254588	254654	61.85
1/4	1/4	2-1/2	1	254401	254467	254533	254599	254665	78.94
5/16	5/16	2-1/2	1	254412	254478	254544	254610	254676	101.15
3/8	3/8	2-1/2	1	254423	254489	254555	254621	254687	123.48
1/2	1/2	3	1	254434	254500	254566	254632	254698	204.39

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION SEE PAGES 198, 200-201.

MADE IN USA

## 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	27.96
3/16	3/16	3/8	2	138697	33.27
1/4	1/4	3/8	3	138708	40.41
3/8	3/8	1/2	4	138719	64.24
1/2	1/2	3/4	4	138730	107.36
5/8	5/8	1	4	138741	191.11
3/4	3/4	1	4	138752	256.61



**120° POINT  
UNCOATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138763	27.96
3/16	3/16	3/8	2	138774	33.27
1/4	1/4	3/8	3	138785	40.41
3/8	3/8	1/2	4	138796	64.24
1/2	1/2	3/4	4	138807	107.36
5/8	5/8	1	4	138818	191.11
3/4	3/4	1	4	138829	256.61



**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	27.96
3/16	3/16	3/8	2	138851	33.27
1/4	1/4	3/8	3	138862	40.41
3/8	3/8	1/2	4	138873	64.24
1/2	1/2	3/4	4	138884	107.36
5/8	5/8	1	4	138895	191.11
3/4	3/4	1	4	138906	256.61

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

## 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	34.94
3/16	3/16	3/8	2	138754	41.60
1/4	1/4	3/8	3	138755	50.74
3/8	3/8	1/2	4	138756	80.30
1/2	1/2	3/4	4	138757	139.77
5/8	5/8	1	4	138758	244.35
3/4	3/4	1	4	138759	320.78



**120° POINT  
ALTIN COATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	ITEM #	LIST PRICE
1/8	1/8	1/4	2	138830	34.94
3/16	3/16	3/8	2	138831	41.60
1/4	1/4	3/8	3	138832	50.74
3/8	3/8	1/2	4	138833	80.30
1/2	1/2	3/4	4	138834	139.77
5/8	5/8	1	4	138835	244.35
3/4	3/4	1	4	138836	320.78



**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	34.94
3/16	3/16	3/8	2	138908	41.60
1/4	1/4	3/8	3	138909	50.74
3/8	3/8	1/2	4	138910	80.30
1/2	1/2	3/4	4	138911	139.77
5/8	5/8	1	4	138912	244.35
3/4	3/4	1	4	138913	320.78

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

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

UNCOATED



ALTiN COATED



### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/32	5/16	1-1/4	138917	15.75	227324	19.68
3/64	3/4	1-1/2	138928	15.75	227335	19.68
1/16	3/4	1-1/2	138939	14.89	227346	18.60
5/64	7/8	1-3/4	138950	15.75	227357	19.68
3/32	1	2	138961	17.34	227368	21.69
7/64	1-1/4	2-1/4	138972	19.72	227379	24.66
1/8	1-1/4	2-1/4	138983	21.02	227390	26.29
9/64	1-3/8	2-1/2	138994	23.28	227401	29.11
5/32	1-3/8	2-1/2	139005	26.11	227412	32.64
11/64	1-5/8	2-3/4	139016	30.82	227423	38.55
3/16	1-5/8	2-3/4	139027	31.71	227434	39.62
13/64	1-3/4	3	139038	36.62	227445	45.79
7/32	1-3/4	3	139049	40.63	227456	50.80
15/64	2	3-1/4	139060	46.01	227467	57.48
1/4	2	3-1/4	139071	48.35	227478	60.42
17/64	2-1/8	3-1/2	139082	54.44	227489	68.07

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
9/32	2-1/8	3-1/2	139093	56.78	227500	71.00
19/64	2-3/8	3-3/4	139104	63.80	227511	79.73
5/16	2-3/8	3-3/4	139115	67.10	227522	83.85
21/64	2-1/2	4	139126	73.23	227533	91.54
11/32	2-1/2	4	139137	80.06	227544	100.08
23/64	2-3/4	4-1/4	139148	89.53	227555	111.92
3/8	2-3/4	4-1/4	139159	94.95	227566	118.68
25/64	2-7/8	4-1/2	139170	111.18	227577	138.96
13/32	2-7/8	4-1/2	139181	121.77	227588	152.22
27/64	2-7/8	4-1/2	139192	132.42	227599	165.51
7/16	2-7/8	4-1/2	139203	138.55	227610	173.23
29/64	3	4-3/4	139214	160.76	227621	200.94
15/32	3	4-3/4	139225	167.48	227632	209.33
31/64	3	4-3/4	139236	172.19	227643	215.27
1/2	3	4-3/4	139247	172.57	227654	215.72
-	-	-	-	-	-	-

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

### METRIC SIZES

SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
0.7	12	31	216775	19.57	228611	24.47
0.8	12	31	216786	19.57	228622	24.47
0.9	16	38	216797	19.57	228633	24.47
1.0	16	38	216808	19.57	228644	24.47
1.1	19	38	216819	19.57	228655	24.47
1.2	19	38	216830	19.57	228666	24.47
1.3	19	38	216841	19.57	228677	24.47
1.4	19	38	216852	19.57	228688	24.47
1.5	19	38	216863	19.72	228699	24.66
1.6	19	38	216874	19.72	228710	24.66
1.7	19	38	216885	19.72	228721	24.66
1.8	22	38	216896	19.72	228732	24.66
1.9	22	38	216907	19.72	228743	24.66
2.0	22	44	216918	20.94	228754	26.18
2.1	22	44	216929	20.94	228765	26.18
2.2	25	50	216940	20.94	228776	26.18
2.3	25	50	216951	20.94	228787	26.18
2.4	25	50	216962	20.94	228798	26.18
2.5	25	50	216973	24.06	228809	30.08
2.6	32	57	216984	24.06	228820	30.08
2.7	32	57	216995	24.06	228831	30.08
2.8	32	57	217006	24.06	228842	30.08
2.9	32	57	217017	24.06	228853	30.08

### METRIC SIZES

SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
3.0	32	57	217028	26.96	228864	33.68
3.1	32	57	217039	26.96	228875	33.68
3.2	32	57	217050	26.96	228886	33.68
3.3	32	57	217061	26.96	228897	33.68
3.4	35	63	217072	29.26	228908	36.62
3.5	35	63	217083	29.26	228919	36.62
4.0	35	63	217094	36.02	228930	45.01
4.5	41	70	217105	38.58	228941	48.24
5.0	44	75	217116	42.67	228952	53.36
5.5	44	75	217127	50.54	228963	63.17
6.0	50	82	217138	53.44	228974	66.77
6.5	50	82	217149	85.11	228985	106.39
7.0	54	89	217160	93.21	228996	116.53
7.5	60	95	217171	96.25	229007	120.32
8.0	60	95	217182	101.82	229018	127.26
8.5	63	100	217193	125.70	229029	157.12
9.0	70	100	217204	142.71	229040	178.40
9.5	70	108	217215	162.84	229051	203.57
10.0	73	114	217226	187.01	229062	233.76
10.5	73	114	217237	209.14	229073	261.43
11.0	73	114	217248	248.84	229084	311.08
11.5	76	120	217259	256.31	229095	320.40
12.0	76	120	217270	284.45	229106	355.60

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

NOTE: SIZES 3.1mm AND UNDER ARE NOT SPLIT.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE +.0000, -.0005

# Carbide Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	46.42	227665	58.00
B	2	3-1/4	139269	48.35	227676	60.42
C	2	3-1/4	139280	48.72	227687	60.90
D	2	3-1/4	139291	49.32	227698	61.64
E	2	3-1/4	139302	48.35	227709	60.42
F	2	3-1/4	139313	53.77	227720	67.21
G	2-1/8	3-1/2	139324	57.04	227731	71.26
H	2-1/8	3-1/2	139335	58.26	227742	72.82
I	2-1/8	3-1/2	139346	59.19	227753	74.01
J	2-1/8	3-1/2	139357	60.79	227764	76.02
K	2-1/8	3-1/2	139368	61.31	227775	76.65
L	2-1/8	3-1/2	139379	64.80	227786	81.03
M	2-3/8	3-3/4	139390	66.14	227797	82.66

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	2-3/8	3-3/4	139401	70.30	227808	87.86
O	2-3/8	3-3/4	139412	74.08	227819	92.61
P	2-3/8	3-3/4	139423	76.91	227830	96.14
Q	2-1/2	4	139434	79.73	227841	99.63
R	2-1/2	4	139445	83.22	227852	104.01
S	2-1/2	4	139456	88.64	227863	110.81
T	2-3/4	4-1/4	139467	91.83	227874	114.75
U	2-3/4	4-1/4	139478	96.37	227885	120.43
V	2-3/4	4-1/4	139489	106.73	227896	133.39
W	2-7/8	4-1/2	139500	114.93	227907	143.68
X	2-7/8	4-1/2	139511	125.44	227918	156.78
Y	2-7/8	4-1/2	139522	129.64	227929	162.06
Z	2-7/8	4-1/2	139533	140.48	227940	175.61

### WIRE SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1	1-3/4	3	139544	42.07	227951	52.58
2	1-3/4	3	139555	42.07	227962	52.58
3	1-3/4	3	139566	42.07	227973	52.58
4	1-3/4	3	139577	41.63	227984	52.03
5	1-3/4	3	139588	37.14	227995	46.46
6	1-3/4	3	139599	37.14	228006	46.46
7	1-3/4	3	139610	36.10	228017	45.12
8	1-3/4	3	139621	35.91	228028	44.90
9	1-3/4	3	139632	35.91	228039	44.90
10	1-5/8	2-3/4	139643	35.91	228050	44.90
11	1-5/8	2-3/4	139654	35.06	228061	43.78
12	1-5/8	2-3/4	139665	35.06	228072	43.78
13	1-5/8	2-3/4	139676	33.79	228083	42.26
14	1-5/8	2-3/4	139687	32.94	228094	41.18
15	1-5/8	2-3/4	139698	32.42	228105	40.51
16	1-5/8	2-3/4	139709	32.42	228116	40.51
17	1-5/8	2-3/4	139720	30.82	228127	38.55
18	1-5/8	2-3/4	139731	29.00	228138	36.24
19	1-5/8	2-3/4	139742	28.37	228149	35.46
20	1-3/8	2-1/2	139753	27.15	228160	33.94
21	1-3/8	2-1/2	139764	27.15	228171	33.94
22	1-3/8	2-1/2	139775	26.11	228182	32.64
23	1-3/8	2-1/2	139786	26.11	228193	32.64
24	1-3/8	2-1/2	139797	25.92	228204	32.42
25	1-3/8	2-1/2	139808	24.51	228215	30.67
26	1-3/8	2-1/2	139819	24.51	228226	30.67
27	1-3/8	2-1/2	139830	24.51	228237	30.67
28	1-3/8	2-1/2	139841	23.28	228248	29.11
29	1-3/8	2-1/2	139852	23.28	228259	29.11
30	1-1/4	2-1/4	139863	22.06	228270	27.59

### WIRE SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
31	1-1/4	2-1/4	139874	20.50	228281	25.62
32	1-1/4	2-1/4	139885	20.50	228292	25.62
33	1-1/4	2-1/4	139896	20.31	228303	25.40
34	1-1/4	2-1/4	139907	20.16	228314	25.18
35	1-1/4	2-1/4	139918	20.16	228325	25.18
36	1-1/4	2-1/4	139929	20.16	228336	25.18
37	1-1/4	2-1/4	139940	19.09	228347	23.88
38	1-1/4	2-1/4	139951	18.75	228358	23.43
39	1-1/4	2-1/4	139962	18.75	228369	23.43
40	1	2	139973	18.05	228380	22.54
41	1	2	139984	18.05	228391	22.54
42	1	2	139995	17.53	228402	21.91
43	1	2	140006	17.53	228413	21.91
44	1	2	140017	16.64	228424	20.80
45	7/8	1-3/4	140028	16.15	228435	20.16
46	7/8	1-3/4	140039	16.15	228446	20.16
47	7/8	1-3/4	140050	16.15	228457	20.16
48	7/8	1-3/4	140061	16.15	228468	20.16
49	7/8	1-3/4	140072	15.41	228479	19.27
50	7/8	1-3/4	140083	15.41	228490	19.27
51	3/4	1-1/2	140094	14.89	228501	18.60
52	3/4	1-1/2	140105	14.89	228512	18.60
53	3/4	1-1/2	140116	15.75	228523	19.68
54	3/4	1-1/2	140127	15.75	228534	19.68
55	3/4	1-1/2	140138	15.75	228545	19.68
56	3/4	1-1/2	140149	15.75	228556	19.68
57	3/4	1-1/2	140160	15.75	228567	19.68
58	3/4	1-1/2	140171	15.75	228578	19.68
59	3/4	1-1/2	140182	15.75	228589	19.68
60	3/4	1-1/2	140193	15.75	228600	19.68

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE +.0000, -.0005

MADE IN USA

83

ENDMILLS  
MICRO  
THREADMILLS  
DRILL MILLS  
CHAMFER MILLS  
DRILLS  
REAMERS  
BURS



## 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	16.75	217358	20.94
3/64	3/8	1-1/2	141480	16.75	217369	20.94
1/16	13/32	1-1/2	141491	15.82	217380	19.76
5/64	7/16	1-1/2	141502	16.75	217391	20.94
3/32	1/2	1-1/2	141513	18.46	217402	23.06
7/64	5/8	2	141524	20.94	217413	26.18
1/8	3/4	2	141535	22.36	217424	27.93
9/64	3/4	2	141546	24.77	217435	30.93
5/32	7/8	2	141557	27.74	217446	34.65
11/64	7/8	2	141568	32.75	217457	40.96
3/16	7/8	2	141579	33.68	217468	42.11
13/64	1-1/8	2-1/2	141590	38.92	217479	48.65
7/32	1-1/8	2-1/2	141601	43.19	217490	53.99
15/64	1-1/4	2-1/2	141612	48.87	217501	61.09
1/4	1-1/4	2-1/2	141623	51.36	217512	64.21
17/64	1-1/4	2-1/2	141634	57.89	217523	72.34

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
9/32	1-1/4	2-1/2	141645	60.31	217534	75.38
19/64	1-1/4	2-1/2	141656	67.73	217545	84.70
5/16	1-1/4	2-1/2	141667	71.34	217556	89.12
21/64	1-3/8	3	141678	77.80	217567	97.26
11/32	1-3/8	3	141689	85.08	217578	106.32
23/64	1-3/8	3	141700	95.10	217589	118.87
3/8	1-3/8	3	141711	100.86	217600	126.07
25/64	1-3/8	3	141722	118.13	217611	147.65
13/32	1-3/8	3	141733	129.38	217622	161.72
27/64	1-3/8	3	141744	140.74	217633	175.91
7/16	1-3/8	3	141755	147.20	217644	184.00
29/64	1-3/8	3	141766	170.78	217655	213.49
15/32	1-3/8	3	141777	177.95	217666	222.44
31/64	1-3/8	3	141788	182.96	217677	228.71
1/2	1-3/8	3	141799	183.37	217688	229.20
-	-	-	-	-	-	-

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	49.32	217699	61.64
B	1-1/4	2-1/2	141821	51.36	217710	64.21
C	1-1/4	2-1/2	141832	51.73	217721	64.69
D	1-1/4	2-1/2	141843	52.40	217732	65.47
E	1-1/4	2-1/2	141854	51.36	217743	64.21
F	1-1/4	2-1/2	141865	57.15	217754	71.41
G	1-1/4	2-1/2	141876	60.57	217765	75.72
H	1-1/4	2-1/2	141887	61.87	217776	77.35
I	1-1/4	2-1/2	141898	62.91	217787	78.65
J	1-1/4	2-1/2	141909	64.58	217798	80.73
K	1-1/4	2-1/2	141920	65.17	217809	81.44
L	1-1/4	2-1/2	141931	68.89	217820	86.08
M	1-1/4	2-1/2	141942	70.26	217831	87.86

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	1-1/4	2-1/2	141953	74.68	217842	93.32
O	1-3/8	3	141964	78.73	217853	98.41
P	1-3/8	3	141975	81.73	217864	102.16
Q	1-3/8	3	141986	84.70	217875	105.87
R	1-3/8	3	141997	88.42	217886	110.51
S	1-3/8	3	142008	94.17	217897	117.75
T	1-3/8	3	142019	97.55	217908	121.95
U	1-3/8	3	142030	102.38	217919	127.97
V	1-3/8	3	142041	113.37	217930	141.71
W	1-3/8	3	142052	122.10	217941	152.62
X	1-3/8	3	142063	133.28	217952	166.59
Y	1-3/8	3	142074	137.73	217963	172.16
Z	1-3/8	3	142085	149.28	217974	186.57

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE +.0000, -.0005

ENDMILLS  
MICRO  
THREADMILLS  
DRILL MILLS  
CHAMFER MILLS  
DRILLS  
REAMERS  
BURS

# Carbide Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	44.67	217985	55.85	31	3/4	2	142426	21.80	218315	27.22
2	1-1/4	2-1/2	142107	44.67	217996	55.85	32	3/4	2	142437	21.80	218326	27.22
3	1-1/8	2-1/2	142118	44.67	218007	55.85	33	3/4	2	142448	21.58	218337	27.00
4	1-1/8	2-1/2	142129	44.19	218018	55.26	34	3/4	2	142459	21.39	218348	26.74
5	1-1/8	2-1/2	142140	39.47	218029	49.32	35	3/4	2	142470	21.39	218359	26.74
6	1-1/8	2-1/2	142151	39.47	218040	49.32	36	5/8	2	142481	21.39	218370	26.74
7	1-1/8	2-1/2	142162	38.32	218051	47.90	37	5/8	2	142492	20.28	218381	25.36
8	1-1/8	2-1/2	142173	38.17	218062	47.72	38	5/8	2	142503	19.90	218392	24.88
9	1-1/8	2-1/2	142184	38.17	218073	47.72	39	5/8	2	142514	19.90	218403	24.88
10	1-1/8	2-1/2	142195	38.17	218084	47.72	40	5/8	2	142525	19.16	218414	23.99
11	1-1/8	2-1/2	142206	37.21	218095	46.53	41	5/8	2	142536	19.16	218425	23.99
12	1-1/8	2-1/2	142217	37.21	218106	46.53	42	1/2	1-1/2	142547	18.64	218436	23.28
13	7/8	2	142228	35.91	218117	44.90	43	1/2	1-1/2	142558	18.64	218447	23.28
14	7/8	2	142239	35.02	218128	43.78	44	1/2	1-1/2	142569	17.68	218458	22.10
15	7/8	2	142250	34.46	218139	43.04	45	1/2	1-1/2	142580	17.12	218469	21.39
16	7/8	2	142261	34.46	218150	43.04	46	1/2	1-1/2	142591	17.12	218480	21.39
17	7/8	2	142272	32.75	218161	40.96	47	1/2	1-1/2	142602	17.12	218491	21.39
18	7/8	2	142283	30.78	218172	38.51	48	7/16	1-1/2	142613	17.12	218502	21.39
19	7/8	2	142294	30.15	218183	37.69	49	7/16	1-1/2	142624	16.38	218513	20.46
20	7/8	2	142305	28.85	218194	36.10	50	7/16	1-1/2	142635	16.38	218524	20.46
21	7/8	2	142316	28.85	218205	36.10	51	7/16	1-1/2	142646	15.82	218535	19.76
22	7/8	2	142327	27.74	218216	34.65	52	7/16	1-1/2	142657	15.82	218546	19.76
23	7/8	2	142338	27.74	218227	34.65	53	13/32	1-1/2	142668	16.75	218557	20.94
24	7/8	2	142349	27.55	218238	34.46	54	13/32	1-1/2	142679	16.75	218568	20.94
25	7/8	2	142360	26.07	218249	32.57	55	13/32	1-1/2	142690	16.75	218579	20.94
26	7/8	2	142371	26.07	218260	32.57	56	3/8	1-1/2	142701	16.75	218590	20.94
27	7/8	2	142382	26.07	218271	32.57	57	3/8	1-1/2	142712	16.75	218601	20.94
28	3/4	2	142393	24.77	218282	30.93	58	3/8	1-1/2	142723	16.75	218612	20.94
29	3/4	2	142404	24.77	218293	30.93	59	3/8	1-1/2	142734	16.75	218623	20.94
30	3/4	2	142415	23.43	218304	29.30	60	3/8	1-1/2	142745	16.75	218634	20.94

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE +.0000, -.0005

MADE IN USA

BURS REAMERS DRILLS CHAMFER MILLS DRILL MILLS THREADMILLS MICRO ENDMILLS

## STRAIGHT FLUTE - 140° SPLIT POINT

UNCOATED



ALTIN COATED



### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/32	3/8	1-1/2	140204	20.02	229117	25.03
3/64	3/8	1-1/2	140215	20.02	229128	25.03
1/16	13/32	1-1/2	140226	20.61	229139	25.73
5/64	7/16	1-1/2	140237	21.50	229150	26.89
3/32	1/2	1-1/2	140248	23.69	229161	29.63
7/64	5/8	2	140259	25.85	229172	32.31
1/8	3/4	2	140270	24.51	229183	30.64
9/64	3/4	2	140281	28.04	229194	35.02
5/32	7/8	2	140292	31.38	229205	39.25
11/64	7/8	2	140303	34.83	229216	43.52
3/16	7/8	2	140314	32.16	229227	40.18
13/64	1-1/8	2-1/2	140325	41.81	229238	52.32
7/32	1-1/8	2-1/2	140336	46.98	229249	58.75
15/64	1-1/4	2-1/2	140347	49.58	229260	61.98
1/4	1-1/4	2-1/2	140358	46.90	229271	58.64

### FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
17/64	1-1/4	2-1/2	140369	65.21	229282	81.47
9/32	1-1/4	2-1/2	140380	67.77	229293	84.74
19/64	1-1/4	2-1/2	140391	71.74	229304	89.68
5/16	1-1/4	2-1/2	140402	74.31	229315	92.87
21/64	1-3/8	3	140413	79.88	229326	99.82
11/32	1-3/8	3	140424	88.60	229337	110.74
23/64	1-3/8	3	140435	96.92	229348	121.17
3/8	1-3/8	3	140446	96.11	229359	120.13
25/64	1-3/8	3	140457	118.87	229370	148.58
13/32	1-3/8	3	140468	113.74	229381	142.19
27/64	1-3/8	3	140479	144.23	229392	180.25
7/16	1-3/8	3	140490	140.67	229403	175.83
15/32	1-3/8	3	140501	156.52	229414	195.66
1/2	1-3/8	3	140512	169.60	229425	212.00
-	-	-	-	-	-	-

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	140523	49.58	229436	61.98
B	1-1/4	2-1/2	140534	49.58	229447	61.98
C	1-1/4	2-1/2	140545	49.58	229458	61.98
D	1-1/4	2-1/2	140556	49.58	229469	61.98
E	1-1/4	2-1/2	140567	46.90	229480	58.64
F	1-1/4	2-1/2	140578	65.21	229491	81.47
G	1-1/4	2-1/2	140589	65.21	229502	81.47
H	1-1/4	2-1/2	140600	65.21	229513	81.47
I	1-1/4	2-1/2	140611	67.77	229524	84.74
J	1-1/4	2-1/2	140622	67.77	229535	84.74
K	1-1/4	2-1/2	140633	67.77	229546	84.74
L	1-1/4	2-1/2	140644	71.74	229557	89.68
M	1-1/4	2-1/2	140655	71.74	229568	89.68

### LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	1-1/4	2-1/2	140666	74.31	229579	92.87
O	1-3/8	3	140677	74.31	229590	92.87
P	1-3/8	3	140688	79.88	229601	99.86
Q	1-3/8	3	140699	88.60	229612	110.74
R	1-3/8	3	140710	88.60	229623	110.74
S	1-3/8	3	140721	96.92	229634	121.17
T	1-3/8	3	140732	96.92	229645	121.17
U	1-3/8	3	140743	107.51	229656	134.35
V	1-3/8	3	140754	107.51	229667	134.35
W	1-3/8	3	140765	118.87	229678	148.58
X	1-3/8	3	140776	131.53	229689	164.43
Y	1-3/8	3	140787	137.88	229700	172.34
Z	1-3/8	3	140798	144.23	229711	180.25

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE +.0000, -.0005

# Carbide Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT FLUTE - 140° SPLIT POINT



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	140809	48.24	229722	60.31	31	3/4	2	141139	27.55	230052	34.50
2	1-1/4	2-1/2	140820	47.38	229733	59.23	32	3/4	2	141150	27.33	230063	34.16
3	1-1/8	2-1/2	140831	45.49	229744	56.85	33	3/4	2	141161	26.63	230074	33.31
4	1-1/8	2-1/2	140842	42.97	229755	53.70	34	3/4	2	141172	26.51	230085	33.16
5	1-1/8	2-1/2	140853	43.45	229766	54.29	35	3/4	2	141183	25.85	230096	32.31
6	1-1/8	2-1/2	140864	42.82	229777	53.51	36	5/8	2	141194	25.59	230107	31.97
7	1-1/8	2-1/2	140875	41.22	229788	51.54	37	5/8	2	141205	25.59	230118	31.97
8	1-1/8	2-1/2	140886	40.63	229799	50.76	38	5/8	2	141216	25.33	230129	31.64
9	1-1/8	2-1/2	140897	39.40	229810	49.24	39	5/8	2	141227	24.32	230140	30.41
10	1-1/8	2-1/2	140908	38.81	229821	48.54	40	5/8	2	141238	24.32	230151	30.41
11	1-1/8	2-1/2	140919	38.14	229832	47.64	41	5/8	2	141249	24.32	230162	30.41
12	1-1/8	2-1/2	140930	37.43	229843	46.79	42	1/2	1-1/2	141260	23.43	230173	29.26
13	7/8	2	140941	36.80	229854	45.97	43	1/2	1-1/2	141271	23.02	230184	28.78
14	7/8	2	140952	36.54	229865	45.71	44	1/2	1-1/2	141282	22.73	230195	28.41
15	7/8	2	140963	36.21	229876	45.23	45	1/2	1-1/2	141293	22.21	230206	27.78
16	7/8	2	140974	36.06	229887	45.08	46	1/2	1-1/2	141304	21.50	230217	26.89
17	7/8	2	140985	35.20	229898	44.00	47	1/2	1-1/2	141315	21.50	230228	26.89
18	7/8	2	140996	34.20	229909	42.74	48	7/16	1-1/2	141326	21.50	230239	26.89
19	7/8	2	141007	33.98	229920	42.48	49	7/16	1-1/2	141337	20.98	230250	26.22
20	7/8	2	141018	32.83	229931	41.03	50	7/16	1-1/2	141348	20.72	230261	25.88
21	7/8	2	141029	32.60	229942	40.77	51	7/16	1-1/2	141359	20.61	230272	25.73
22	7/8	2	141040	31.97	229953	39.99	52	7/16	1-1/2	141370	20.61	230283	25.73
23	7/8	2	141051	30.64	229964	38.29	53	13/32	1-1/2	141381	20.31	230294	25.40
24	7/8	2	141062	29.78	229975	37.25	54	13/32	1-1/2	141392	20.31	230305	25.40
25	7/8	2	141073	28.89	229986	36.13	55	13/32	1-1/2	141403	20.02	230316	25.03
26	7/8	2	141084	28.56	229997	35.69	56	3/8	1-1/2	141414	20.02	230327	25.03
27	7/8	2	141095	28.00	230008	35.02	57	3/8	1-1/2	141425	20.02	230338	25.03
28	3/4	2	141106	27.07	230019	33.79	58	3/8	1-1/2	141436	20.02	230349	25.03
29	3/4	2	141117	26.48	230030	33.09	59	3/8	1-1/2	141447	20.02	230360	25.03
30	3/4	2	141128	26.07	230041	32.60	60	3/8	1-1/2	141458	20.02	230371	25.03

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGE 202.

DIAMETER TOLERANCE      +.0000, -.0005

MADE IN USA

ENDMILLS  
MICRO  
THREADMILLS  
DRILL MILLS  
CHAMFER MILLS  
DRILLS  
REAMERS  
BURS

# Carbide Reamers

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**ENDMILLS**  
**MICRO**  
**THREADMILLS**  
**DRILL MILLS**  
**CHAMFER MILLS**  
**DRILLS**  
**REAMERS**  
**BURS**

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0400	N60	.0400	1/4	1-1/2	4	157353	41.00
.0410	N59	.0410	3/8	1-1/2	4	157364	41.00
.0420	N58	.0420	3/8	1-1/2	4	157375	41.00
.0430	N57	.0430	3/8	1-1/2	4	157386	41.00
.0440		.0440	3/8	1-1/2	4	157397	43.32
.0450		.0450	3/8	1-1/2	4	157408	43.32
.0460		.0460	3/8	1-1/2	4	157419	43.32
.0465	N56	.0465	3/8	1-1/2	4	157430	41.00
.0469	3/64	.0469	3/8	1-1/2	4	157441	38.96
.0470		.0470	3/8	1-1/2	4	157452	43.32
.0480		.0480	3/8	1-1/2	4	157463	43.32
.0490		.0490	3/8	1-1/2	4	157474	43.32
.0500		.0500	3/8	1-1/2	4	157485	43.32
.0510		.0510	3/8	1-1/2	4	157496	43.32
.0520	N55	.0520	3/8	1-1/2	4	157507	41.00
.0530		.0530	3/8	1-1/2	4	157518	43.32
.0540		.0540	3/8	1-1/2	4	157529	43.32
.0550	N54	.0550	3/8	1-1/2	4	157540	41.00
.0560		.0560	3/8	1-1/2	4	157551	43.32
.0570		.0570	3/8	1-1/2	4	157562	43.32
.0580		.0580	3/8	1-1/2	4	157573	43.32
.0590		.0590	3/8	1-1/2	4	157584	43.32
.0591	1.5mm	.0591	3/8	1-1/2	4	157595	43.32
.0595	N53	.0595	3/8	1-1/2	4	157606	41.00
.0600		.0600	3/8	1-1/2	4	157617	43.32
.0605		.0605	3/8	1-1/2	4	157628	57.61
.0610		.0610	3/8	1-1/2	4	157639	43.32
.0615		.0615	3/8	1-1/2	4	157650	47.92
.0620		.0620	3/8	1-1/2	4	157661	43.32
.0625	1/16	.0625	3/8	1-1/2	4	157672	38.96
.0630		.0630	3/8	1-1/2	4	157683	43.32
.0635	N52	.0635	3/8	1-1/2	4	157694	41.00
.0640		.0640	3/8	1-1/2	4	157705	43.32
.0645		.0645	3/8	1-1/2	4	157716	57.61
.0650		.0650	3/8	1-1/2	4	157727	43.32
.0660		.0660	1/2	1-3/4	4	157738	43.32
.0670	N51	.0670	1/2	1-3/4	4	157749	41.00
.0680		.0680	1/2	1-3/4	4	157760	43.32
.0690		.0690	1/2	1-3/4	4	157771	43.32
.0700	N50	.0700	1/2	1-3/4	4	157782	41.00
.0710		.0710	1/2	1-3/4	4	157793	43.32
.0720		.0720	1/2	1-3/4	4	157804	43.32
.0730	N49	.0730	1/2	1-3/4	4	157815	41.00
.0740		.0740	1/2	1-3/4	4	157826	43.32
.0750		.0750	1/2	1-3/4	4	157837	43.32
.0760	N48	.0760	1/2	1-3/4	4	157848	41.00
.0770		.0770	1/2	1-3/4	4	157859	43.32
.0780		.0780	1/2	1-3/4	4	157870	43.32
.0781	5/64	.0781	1/2	1-3/4	4	157881	38.96
.0785	N47	.0785	1/2	1-3/4	4	157892	41.00
.0787	2mm	.0787	1/2	1-3/4	4	157903	43.32
.0790		.0790	1/2	1-3/4	4	157914	43.32
.0800		.0800	1/2	1-3/4	4	157925	43.32
.0810	N46	.0810	1/2	2	4	157936	41.00
.0820	N45	.0820	1/2	2	4	157947	41.00
.0830		.0830	1/2	2	4	157958	43.32

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0840		.0840	1/2	2	4	157969	43.32
.0850		.0850	1/2	2	4	157980	43.32
.0860	N44	.0860	1/2	2	4	157991	41.00
.0870		.0870	1/2	2	4	158002	43.32
.0880		.0880	1/2	2	4	158013	43.32
.0890	N43	.0890	1/2	2	4	158024	41.00
.0900		.0900	1/2	2	4	158035	43.32
.0910		.0910	1/2	2	4	158046	43.32
.0915		.0915	1/2	2	4	158057	57.14
.0920		.0920	1/2	2	4	158068	43.32
.0925		.0925	1/2	2	4	158079	47.92
.0930		.0930	1/2	2	4	158090	43.32
.0935	N42	.0935	1/2	2	4	158101	41.00
.0938	3/32	.0938	1/2	2	4	158112	38.96
.0940		.0940	1/2	2	4	158123	43.32
.0945		.0945	1/2	2	4	158134	47.92
.0950		.0950	1/2	2	4	158145	43.32
.0960	N41	.0960	5/8	2	4	158156	41.00
.0970		.0970	5/8	2	4	158167	43.32
.0980	N40	.0980	5/8	2	4	158178	41.00
.0984	2.5mm	.0984	5/8	2	4	158189	43.32
.0990		.0990	5/8	2-1/4	4	158200	43.32
.0995	N39	.0995	5/8	2-1/4	4	158211	41.00
.1000		.1000	5/8	2-1/4	4	158222	43.32
.1010		.1010	5/8	2-1/4	4	158233	43.32
.1015	N38	.1015	5/8	2-1/4	4	158244	41.00
.1020		.1020	5/8	2-1/4	4	158255	43.32
.1030		.1030	5/8	2-1/4	4	158266	43.32
.1040	N37	.1040	5/8	2-1/4	4	158277	41.00
.1050		.1050	5/8	2-1/4	4	158288	43.32
.1060		.1060	5/8	2-1/4	4	158299	43.32
.1065	N36	.1065	5/8	2-1/4	4	158310	41.00
.1070		.1070	5/8	2-1/4	4	158321	43.32
.1080		.1080	5/8	2-1/4	4	158332	43.32
.1090		.1090	5/8	2-1/4	4	158343	45.14
.1094	7/64	.1094	5/8	2-1/4	4	158354	38.96
.1100	N35	.1100	5/8	2-1/4	4	158365	41.00
.1110	N34	.1110	5/8	2-1/4	4	158376	41.00
.1120		.1120	5/8	2-1/4	4	158387	43.32
.1130	N33	.1130	5/8	2-1/4	4	158398	41.00
.1140		.1140	5/8	2-1/4	4	158409	43.32
.1150		.1150	5/8	2-1/4	4	158420	43.32
.1160	N32	.1160	5/8	2-1/4	4	158431	43.13
.1170		.1170	5/8	2-1/4	4	158442	45.87
.1180		.1180	5/8	2-1/4	4	158453	45.87
.1181	3mm	.1181	5/8	2-1/4	4	158464	42.16
.1190		.1190	5/8	2-1/4	4	158475	45.87
.1200	N31	.1200	5/8	2-1/4	4	158486	43.13
.1210		.1210	5/8	2-1/4	4	158497	45.87
.1220		.1220	5/8	2-1/4	4	158508	45.87
.1230		.1230	5/8	2-1/4	4	158519	45.87
.1235		.1235	5/8	2-1/4	4	158530	61.08
.1240		.1240	5/8	2-1/4	4	158541	45.87
.1245		.1245	5/8	2-1/4	4	158552	50.70
.1250	1/8	.1250	5/8	2-1/4	4	158563	41.47
.1255		.1255	5/8	2-1/4	4	158574	50.70

CONTINUED ON NEXT PAGE

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



# Carbide Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1260		.1260	5/8	2-1/4	4	158585	45.87
.1265		.1265	5/8	2-1/4	4	158596	61.08
.1270		.1270	5/8	2-1/4	4	158607	45.87
.1275		.1275	5/8	2-1/4	4	158618	61.08
.1280		.1280	5/8	2-1/4	4	158629	45.87
.1285	N30	.1285	5/8	2-1/4	4	158640	45.87
.1290		.1290	5/8	2-1/4	4	158651	45.87
.1300		.1300	5/8	2-1/2	4	158662	45.87
.1310		.1310	3/4	2-1/2	4	158673	52.51
.1320		.1320	3/4	2-1/2	4	158684	52.51
.1330		.1330	3/4	2-1/2	4	158695	52.51
.1340		.1340	3/4	2-1/2	4	158706	52.51
.1350		.1350	3/4	2-1/2	4	158717	52.51
.1360	N29	.1360	3/4	2-1/2	4	158728	49.11
.1370		.1370	3/4	2-1/2	4	158739	52.51
.1378	3.5mm	.1378	3/4	2-1/2	4	158750	52.51
.1380		.1380	3/4	2-1/2	4	158761	52.51
.1390		.1390	3/4	2-1/2	4	158772	52.51
.1400		.1400	3/4	2-1/2	4	158783	52.51
.1405	N28	.1405	3/4	2-1/2	4	158794	49.11
.1406	9/64	.1406	3/4	2-1/2	4	158805	47.26
.1410		.1410	3/4	2-1/2	4	158816	52.51
.1420		.1420	3/4	2-1/2	4	158827	52.51
.1430		.1430	3/4	2-1/2	4	158838	52.51
.1440	N27	.1440	3/4	2-1/2	4	158849	49.11
.1450		.1450	3/4	2-1/2	4	158860	52.51
.1460		.1460	3/4	2-1/2	4	158871	54.83
.1470	N26	.1470	3/4	2-1/2	4	158882	51.16
.1480		.1480	3/4	2-1/2	4	158893	54.83
.1490		.1490	3/4	2-1/2	4	158904	54.83
.1495	N25	.1495	3/4	2-1/2	4	158915	51.16
.1500		.1500	3/4	2-1/2	4	158926	54.83
.1510		.1510	3/4	2-1/2	4	158937	54.83
.1520	N24	.1520	3/4	2-1/2	4	158948	51.16
.1530		.1530	3/4	2-1/2	4	158959	54.83
.1540	N23	.1540	3/4	2-1/2	4	158970	51.16
.1545		.1545	3/4	2-1/2	4	158981	63.40
.1550		.1550	3/4	2-1/2	4	158992	54.83
.1555		.1555	3/4	2-1/2	4	159003	63.40
.1560		.1560	3/4	2-1/2	4	159014	54.83
.1562	5/32	.1562	3/4	2-1/2	4	159025	49.58
.1565		.1565	3/4	2-1/2	4	159036	63.40
.1570	N22	.1570	3/4	2-1/2	4	159047	51.16
.1575	4mm	.1575	3/4	2-1/2	4	159058	54.83
.1580		.1580	3/4	2-1/2	4	159069	54.83
.1590	N21	.1590	3/4	2-1/2	4	159080	51.16
.1600		.1600	3/4	2-1/2	4	159091	54.83
.1610	N20	.1610	7/8	2-1/2	4	159102	57.61
.1620		.1620	7/8	2-3/4	4	159113	61.74
.1630		.1630	7/8	2-3/4	4	159124	61.74
.1640		.1640	7/8	2-3/4	4	159135	61.74
.1650		.1650	7/8	2-3/4	4	159146	57.61
.1660	N19	.1660	7/8	2-3/4	4	159157	57.61
.1670		.1670	7/8	2-3/4	4	159168	61.74
.1680		.1680	7/8	2-3/4	4	159179	61.74
.1690		.1690	7/8	2-3/4	4	159190	61.74

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1695	N18	.1695	7/8	2-3/4	4	159201	57.61
.1700		.1700	7/8	2-3/4	4	159212	61.74
.1710		.1710	7/8	2-3/4	4	159223	61.74
.1719	11/64	.1719	7/8	2-3/4	4	159234	55.52
.1720		.1720	7/8	2-3/4	4	159245	61.74
.1730	N17	.1730	7/8	2-3/4	4	159256	57.61
.1740		.1740	7/8	2-3/4	4	159267	61.74
.1750		.1750	7/8	2-3/4	4	159278	61.74
.1760		.1760	7/8	2-3/4	4	159289	61.74
.1770	N16	.1770	7/8	2-3/4	4	159300	57.61
.1772	4.5mm	.1772	7/8	2-3/4	4	159311	64.29
.1780		.1780	7/8	2-3/4	4	159322	61.74
.1790		.1790	7/8	2-3/4	4	159333	61.74
.1800	N15	.1800	7/8	2-3/4	4	159344	57.61
.1810		.1810	7/8	2-3/4	4	159355	61.74
.1820	N14	.1820	7/8	2-3/4	4	159366	57.61
.1830		.1830	7/8	2-3/4	4	159377	61.74
.1840		.1840	7/8	2-3/4	4	159388	61.74
.1850	N13	.1850	7/8	2-3/4	4	159399	57.61
.1855		.1855	7/8	2-3/4	4	159410	74.21
.1860		.1860	7/8	2-3/4	4	159421	61.74
.1865		.1865	7/8	2-3/4	4	159432	66.37
.1870		.1870	7/8	2-3/4	4	159443	61.74
.1875	3/16	.1875	7/8	2-3/4	4	159454	55.52
.1880		.1880	7/8	2-3/4	4	159465	61.74
.1885		.1885	7/8	2-3/4	4	159476	66.37
.1890	N12	.1890	7/8	2-3/4	4	159487	57.61
.1900		.1900	7/8	2-3/4	4	159498	61.74
.1910	N11	.1910	7/8	2-3/4	4	159509	70.04
.1920		.1920	7/8	2-3/4	4	159520	74.91
.1930		.1930	7/8	2-3/4	4	159531	74.91
.1935	N10	.1935	7/8	2-3/4	4	159542	70.04
.1940		.1940	7/8	2-3/4	4	159553	74.91
.1950		.1950	7/8	2-3/4	4	159564	74.91
.1960	N9	.1960	1	3	4	159575	70.04
.1969	5mm	.1969	1	3	4	159586	74.91
.1970		.1970	1	3	4	159597	74.91
.1980		.1980	1	3	4	159608	74.91
.1990	N8	.1990	1	3	4	159619	70.04
.2000		.2000	1	3	4	159630	74.91
.2010	N7	.2010	1	3	4	159641	70.04
.2020		.2020	1	3	4	159652	74.91
.2030		.2030	1	3	4	159663	74.91
.2031	13/64	.2031	1	3	4	159674	67.26
.2040	N6	.2040	1	3	4	159685	70.04
.2050		.2050	1	3	4	159696	74.91
.2055	N5	.2055	1	3	4	159707	70.04
.2060		.2060	1	3	4	159718	74.91
.2070		.2070	1	3	4	159729	74.91
.2080		.2080	1	3	4	159740	74.91
.2090	N4	.2090	1	3	4	159751	70.04
.2100		.2100	1	3	4	159762	74.91
.2110		.2110	1	3	4	159773	74.91
.2120		.2120	1	3	4	159784	74.91
.2130	N3	.2130	1	3	4	159795	70.04
.2140		.2140	1	3	4	159806	74.91

CONTINUED ON NEXT PAGE

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

MADE IN USA

# Carbide Reamers

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**ENDMILLS**  
**MICRO**  
**THREADMILLS**  
**DRILL MILLS**  
**CHAMFER MILLS**  
**DRILLS**  
**REAMERS**  
**BURS**

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2150		.2150	1	3	4	159817	74.91
.2160		.2160	1	3	4	159828	74.91
.2165	5.5mm	.2165	1	3	4	159839	79.04
.2170		.2170	1	3	4	159850	74.91
.2180		.2180	1	3	4	159861	74.91
.2188	7/32	.2188	1	3	4	159872	67.26
.2190		.2190	1	3	4	159883	74.91
.2200		.2200	1	3	4	159894	74.91
.2210	N2	.2210	1	3	4	159905	70.04
.2220		.2220	1	3	4	159916	74.91
.2230		.2230	1	3	4	159927	74.91
.2240		.2240	1	3	4	159938	74.91
.2250		.2250	1	3	4	159949	74.91
.2260		.2260	1	3	4	159960	82.28
.2270		.2270	1	3	4	159971	82.28
.2280	N1	.2280	1	3	4	159982	76.76
.2290		.2290	1	3	4	159993	76.76
.2300		.2300	1	3	4	160004	82.28
.2310		.2310	1	3	4	160015	82.28
.2320		.2320	1	3	4	160026	82.28
.2330		.2330	1	3	4	160037	82.28
.2340	A	.2340	1	3	4	160048	82.28
.2344	15/64	.2344	1	3	4	160059	73.98
.2350		.2350	1	3	4	160070	82.28
.2360		.2360	1	3	4	160081	82.28
.2362	6mm	.2362	1	3	4	160092	78.34
.2370		.2370	1	3	4	160103	82.28
.2380	B	.2380	1	3	4	160114	82.28
.2390		.2390	1	3	4	160125	82.28
.2400		.2400	1	3	4	160136	82.28
.2410		.2410	1	3	4	160147	82.28
.2420	C	.2420	1	3	4	160158	82.28
.2430		.2430	1	3	4	160169	82.28
.2440		.2440	1	3	4	160180	82.28
.2450		.2450	1	3	4	160191	82.28
.2460	D	.2460	1	3	4	160202	82.28
.2470		.2470	1	3	4	160213	82.28
.2480		.2480	1	3	4	160224	82.28
.2485		.2485	1	3	4	160235	91.93
.2490		.2490	1	3	4	160246	82.28
.2495		.2495	1	3	4	160257	87.34
.2500	1/4	.2500	1	3	4	160268	73.98
.2505		.2505	1	3	4	160279	87.34
.2510		.2510	1	3	4	160290	82.28
.2515		.2515	1	3	4	160301	102.32
.2520		.2520	1	3	4	160312	82.28
.2530		.2530	1	3	4	160323	82.28
.2540		.2540	1	3	4	160334	82.28
.2550		.2550	1	3	6	160345	82.28
.2559	6.5mm	.2559	1-1/8	3-1/4	6	160356	87.11
.2560		.2560	1-1/8	3-1/4	6	160367	99.54
.2570	F	.2570	1-1/8	3-1/4	6	160378	99.54
.2580		.2580	1-1/8	3-1/4	6	160389	99.54
.2590		.2590	1-1/8	3-1/4	6	160400	99.54
.2600		.2600	1-1/8	3-1/4	6	160411	99.54
.2610	G	.2610	1-1/8	3-1/4	6	160422	99.54

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2620		.2620	1-1/8	3-1/4	6	160433	99.54
.2630		.2630	1-1/8	3-1/4	6	160444	99.54
.2640		.2640	1-1/8	3-1/4	6	160455	99.54
.2650		.2650	1-1/8	3-1/4	6	160466	99.54
.2656	17/64	.2656	1-1/8	3-1/4	6	160477	89.65
.2660	H	.2660	1-1/8	3-1/4	6	160488	99.54
.2670		.2670	1-1/8	3-1/4	6	160499	99.54
.2680		.2680	1-1/8	3-1/4	6	160510	99.54
.2690		.2690	1-1/8	3-1/4	6	160521	99.54
.2700		.2700	1-1/8	3-1/4	6	160532	99.54
.2710		.2710	1-1/8	3-1/4	6	160543	99.54
.2720	I	.2720	1-1/8	3-1/4	6	160554	99.54
.2730		.2730	1-1/8	3-1/4	6	160565	99.54
.2740		.2740	1-1/8	3-1/4	6	160576	99.54
.2750		.2750	1-1/8	3-1/4	6	160587	99.54
.2756	7mm	.2756	1-1/8	3-1/4	6	160598	108.73
.2760		.2760	1-1/8	3-1/4	6	160609	99.54
.2770	J	.2770	1-1/8	3-1/4	6	160620	99.54
.2780		.2780	1-1/8	3-1/4	6	160631	99.54
.2790		.2790	1-1/8	3-1/4	6	160642	99.54
.2800		.2800	1-1/8	3-1/4	6	160653	99.54
.2810	K	.2810	1-1/8	3-1/4	6	160664	99.54
.2812	9/32	.2812	1-1/8	3-1/4	6	160675	89.65
.2820		.2820	1-1/8	3-1/4	6	160686	99.54
.2830		.2830	1-1/8	3-1/4	6	160697	99.54
.2840		.2840	1-1/8	3-1/4	6	160708	99.54
.2850		.2850	1-1/8	3-1/4	6	160719	99.54
.2860		.2860	1-1/8	3-1/4	6	160730	99.54
.2870		.2870	1-1/8	3-1/4	6	160741	99.54
.2880		.2880	1-1/8	3-1/4	6	160752	99.54
.2890		.2890	1-1/8	3-1/4	6	160763	99.54
.2900	L	.2900	1-1/8	3-1/4	6	160774	99.54
.2910		.2910	1-1/8	3-1/4	6	160785	99.54
.2920		.2920	1-1/8	3-1/4	6	160796	99.54
.2930		.2930	1-1/8	3-1/4	6	160807	99.54
.2940		.2940	1-1/8	3-1/4	6	160818	99.54
.2950	M	.2950	1-1/8	3-1/4	6	160829	99.54
.2953	7.5mm	.2953	1-1/8	3-1/4	6	160840	108.73
.2960		.2960	1-1/8	3-1/4	6	160851	99.54
.2969	19/64	.2969	1-1/8	3-1/4	6	160862	99.54
.2970		.2970	1-1/8	3-1/4	6	160873	99.54
.2980		.2980	1-1/8	3-1/4	6	160884	99.54
.2990		.2990	1-1/8	3-1/4	6	160895	99.54
.3000		.3000	1-1/8	3-1/4	6	160906	99.54
.3010		.3010	1-1/8	3-1/4	6	160917	99.54
.3020	N	.3020	1-1/8	3-1/4	6	160928	99.54
.3030		.3030	1-1/8	3-1/4	6	160939	99.54
.3040		.3040	1-1/8	3-1/4	6	160950	99.54
.3050		.3050	1-1/8	3-1/4	6	160961	99.54
.3060		.3060	1-1/8	3-1/4	6	160972	99.54
.3070		.3070	1-1/8	3-1/4	6	160983	99.54
.3080		.3080	1-1/8	3-1/4	6	160994	99.54
.3090		.3090	1-1/8	3-1/4	6	161005	99.54
.3100		.3100	1-1/8	3-1/4	6	161016	99.54
.3110		.3110	1-1/8	3-1/4	6	161027	99.54
.3115		.3115	1-1/8	3-1/4	6	161038	114.29

CONTINUED ON NEXT PAGE

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

# Carbide Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3120		.3120	1-1/8	3-1/4	6	161049	99.54
.3125	5/16	.3125	1-1/8	3-1/4	6	161060	99.54
.3130		.3130	1-1/8	3-1/4	6	161071	99.54
.3135		.3135	1-1/8	3-1/4	6	161082	114.29
.3140		.3140	1-1/8	3-1/4	6	161093	99.54
.3150	8mm	.3150	1-1/8	3-1/4	6	161104	99.54
.3160	O	.3160	1-1/8	3-1/4	6	161115	111.32
.3170		.3170	1-1/8	3-1/4	6	161126	111.32
.3180		.3180	1-1/8	3-1/4	6	161137	111.32
.3190		.3190	1-1/8	3-1/4	6	161148	111.32
.3200		.3200	1-1/8	3-1/4	6	161159	111.32
.3210		.3210	1-1/4	3-1/2	6	161170	111.32
.3220		.3220	1-1/4	3-1/2	6	161181	111.32
.3230	P	.3230	1-1/4	3-1/2	6	161192	111.32
.3240		.3240	1-1/4	3-1/2	6	161203	111.32
.3250		.3250	1-1/4	3-1/2	6	161214	111.32
.3260		.3260	1-1/4	3-1/2	6	161225	111.32
.3270		.3270	1-1/4	3-1/2	6	161236	111.32
.3280		.3280	1-1/4	3-1/2	6	161247	111.32
.3281	21/64	.3281	1-1/4	3-1/2	6	161258	112.44
.3290		.3290	1-1/4	3-1/2	6	161269	111.32
.3300		.3300	1-1/4	3-1/2	6	161280	111.32
.3310		.3310	1-1/4	3-1/2	6	161291	111.32
.3320	Q	.3320	1-1/4	3-1/2	6	161302	111.32
.3330		.3330	1-1/4	3-1/2	6	161313	111.32
.3340		.3340	1-1/4	3-1/2	6	161324	111.32
.3346	8.5mm	.3346	1-1/4	3-1/2	6	161335	111.32
.3350		.3350	1-1/4	3-1/2	6	161346	111.32
.3360		.3360	1-1/4	3-1/2	6	161357	111.32
.3370		.3370	1-1/4	3-1/2	6	161368	111.32
.3380		.3380	1-1/4	3-1/2	6	161379	111.32
.3390	R	.3390	1-1/4	3-1/2	6	161390	112.05
.3400		.3400	1-1/4	3-1/2	6	161401	111.32
.3410		.3410	1-1/4	3-1/2	6	161412	111.32
.3420		.3420	1-1/4	3-1/2	6	161423	111.32
.3430		.3430	1-1/4	3-1/2	6	161434	111.32
.3438	11/32	.3438	1-1/4	3-1/2	6	161445	112.44
.3440		.3440	1-1/4	3-1/2	6	161456	111.32
.3450		.3450	1-1/4	3-1/2	6	161467	111.32
.3460		.3460	1-1/4	3-1/2	6	161478	111.32
.3470		.3470	1-1/4	3-1/2	6	161489	111.32
.3480	S	.3480	1-1/4	3-1/2	6	161500	111.32
.3490		.3490	1-1/4	3-1/2	6	161511	111.32
.3500		.3500	1-1/4	3-1/2	6	161522	111.32
.3510		.3510	1-1/4	3-1/2	6	161533	121.43
.3520		.3520	1-1/4	3-1/2	6	161544	121.43
.3530		.3530	1-1/4	3-1/2	6	161555	121.43
.3540		.3540	1-1/4	3-1/2	6	161566	121.43
.3543	9mm	.3543	1-1/4	3-1/2	6	161577	126.72
.3550		.3550	1-1/4	3-1/2	6	161588	121.43
.3560		.3560	1-1/4	3-1/2	6	161599	121.43
.3570		.3570	1-1/4	3-1/2	6	161610	121.43
.3580	T	.3580	1-1/4	3-1/2	6	161621	121.43
.3590		.3590	1-1/4	3-1/2	6	161632	123.52
.3594	23/64	.3594	1-1/4	3-1/2	6	161643	119.81
.3600		.3600	1-1/4	3-1/2	6	161654	121.43

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3610		.3610	1-1/4	3-1/2	6	161665	121.43
.3620		.3620	1-1/4	3-1/2	6	161676	121.43
.3630		.3630	1-1/4	3-1/2	6	161687	121.43
.3640		.3640	1-1/4	3-1/2	6	161698	121.43
.3650		.3650	1-1/4	3-1/2	6	161709	121.43
.3660		.3660	1-1/4	3-1/2	6	161720	121.43
.3670		.3670	1-1/4	3-1/2	6	161731	121.43
.3680	U	.3680	1-1/4	3-1/2	6	161742	121.43
.3690		.3690	1-1/4	3-1/2	6	161753	121.43
.3700		.3700	1-1/4	3-1/2	6	161764	121.43
.3710		.3710	1-1/4	3-1/2	6	161775	121.43
.3720		.3720	1-1/4	3-1/2	6	161786	121.43
.3730		.3730	1-1/4	3-1/2	6	161797	121.43
.3740	9.5mm	.3740	1-1/4	3-1/2	6	161808	101.39
.3745		.3745	1-1/4	3-1/2	6	161819	147.46
.3750	3/8	.3750	1-1/4	3-1/2	6	161830	119.81
.3755		.3755	1-1/4	3-1/2	6	161841	147.46
.3760		.3760	1-1/4	3-1/2	6	161852	152.51
.3765		.3765	1-1/4	3-1/2	6	161863	160.00
.3770	V	.3770	1-1/4	3-1/2	6	161874	152.51
.3780		.3780	1-1/4	3-1/2	6	161885	152.51
.3790		.3790	1-1/4	3-1/2	6	161896	152.51
.3800		.3800	1-1/4	3-1/2	6	161907	152.51
.3810		.3810	1-1/4	3-1/2	6	161918	152.51
.3820		.3820	1-1/4	3-1/2	6	161929	152.51
.3830		.3830	1-1/4	3-1/2	6	161940	152.51
.3840		.3840	1-1/4	3-1/2	6	161951	152.51
.3850		.3850	1-1/4	3-1/2	6	161962	152.51
.3860	W	.3860	1-1/4	3-1/2	6	161973	152.51
.3870		.3870	1-1/4	3-1/2	6	161984	189.19
.3880		.3880	1-1/4	3-1/2	6	161995	189.19
.3890		.3890	1-1/4	3-1/2	6	162006	189.19
.3900		.3900	1-1/4	3-1/2	6	162017	189.19
.3906	25/64	.3906	1-1/4	3-1/2	6	162028	137.34
.3910		.3910	1-1/4	3-1/2	6	162039	189.19
.3920		.3920	1-1/4	3-1/2	6	162050	189.19
.3930		.3930	1-1/4	3-1/2	6	162061	189.19
.3937	10mm	.3937	1-1/4	3-1/2	6	162072	143.32
.3940		.3940	1-1/4	3-1/2	6	162083	189.19
.3950		.3950	1-1/4	3-1/2	6	162094	189.19
.3960		.3960	1-1/4	3-1/2	6	162105	189.19
.3970	X	.3970	1-1/4	3-1/2	6	162116	189.19
.3980		.3980	1-1/4	3-1/2	6	162127	189.19
.3990		.3990	1-1/4	3-1/2	6	162138	189.19
.4000		.4000	1-1/4	3-1/2	6	162149	189.19
.4010		.4010	1-1/4	3-1/2	6	162160	189.19
.4020		.4020	1-1/4	3-1/2	6	162171	189.19
.4030		.4030	1-1/4	3-1/2	6	162182	189.19
.4040	Y	.4040	1-1/4	3-1/2	6	162193	189.19
.4050		.4050	1-1/4	3-1/2	6	162204	189.19
.4060		.4060	1-1/4	3-1/2	6	162215	189.19
.4062	13/32	.4062	1-1/4	3-1/2	6	162226	137.34
.4070		.4070	1-1/4	3-1/2	6	162237	189.19
.4080		.4080	1-1/4	3-1/2	6	162248	189.19
.4090		.4090	1-1/4	3-1/2	6	162259	189.19
.4100		.4100	1-1/4	3-1/2	6	162270	189.19

CONTINUED ON NEXT PAGE

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

MADE IN USA

91

ENDMILLS

MICRO

THREADMILLS

DRILL MILLS

CHAMFER MILLS

DRILLS

REAMERS

BURS



# Carbide Reamers

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**ENDMILLS**  
**MICRO**  
**THREADMILLS**  
**DRILL MILLS**  
**CHAMFER MILLS**  
**DRILLS**  
**REAMERS**  
**BURS**

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4110		.4110	1-1/4	3-1/2	6	162281	189.19
.4120		.4120	1-1/4	3-1/2	6	162292	189.19
.4130	Z	.4130	1-1/4	3-1/2	6	162303	189.19
.4134	10.5mm	.4134	1-1/4	3-1/2	6	162314	172.32
.4140		.4140	1-1/4	3-1/2	6	162325	189.19
.4150		.4150	1-1/4	3-1/2	6	162336	189.19
.4160		.4160	1-3/8	4	6	162347	189.19
.4170		.4170	1-3/8	4	6	162358	189.19
.4180		.4180	1-3/8	4	6	162369	189.19
.4190		.4190	1-3/8	4	6	162380	189.19
.4200		.4200	1-3/8	4	6	162391	189.19
.4210		.4210	1-3/8	4	6	162402	189.19
.4219	27/64	.4219	1-3/8	4	6	162413	155.72
.4220		.4220	1-3/8	4	6	162424	189.19
.4230		.4230	1-3/8	4	6	162435	189.19
.4240		.4240	1-3/8	4	6	162446	189.19
.4250		.4250	1-3/8	4	6	162457	189.19
.4260		.4260	1-3/8	4	6	162468	189.19
.4270		.4270	1-3/8	4	6	162479	189.19
.4280		.4280	1-3/8	4	6	162490	189.19
.4290		.4290	1-3/8	4	6	162501	189.19
.4300		.4300	1-3/8	4	6	162512	189.19
.4310		.4310	1-3/8	4	6	162523	189.19
.4320		.4320	1-3/8	4	6	162534	189.19
.4330		.4330	1-3/8	4	6	162545	189.19
.4331	11mm	.4331	1-3/8	4	6	162556	172.32
.4340		.4340	1-3/8	4	6	162567	189.19
.4350		.4350	1-3/8	4	6	162578	189.19
.4360		.4360	1-3/8	4	6	162589	189.19
.4365		.4365	1-3/8	4	6	162600	189.19
.4370		.4370	1-3/8	4	6	162611	189.19
.4375	7/16	.4375	1-3/8	4	6	162622	155.72
.4380		.4380	1-3/8	4	6	162633	189.19
.4385		.4385	1-3/8	4	6	162644	226.07
.4390		.4390	1-3/8	4	6	162655	189.19
.4400		.4400	1-3/8	4	6	162666	189.19
.4410		.4410	1-3/8	4	6	162677	214.68
.4420		.4420	1-3/8	4	6	162688	214.68
.4430		.4430	1-3/8	4	6	162699	214.68
.4440		.4440	1-3/8	4	6	162710	214.68
.4450		.4450	1-3/8	4	6	162721	214.68
.4460		.4460	1-3/8	4	6	162732	214.68
.4470		.4470	1-3/8	4	6	162743	214.68
.4480		.4480	1-3/8	4	6	162754	214.68
.4490		.4490	1-3/8	4	6	162765	214.68
.4500		.4500	1-3/8	4	6	162776	214.68
.4510		.4510	1-3/8	4	6	162787	214.68
.4520		.4520	1-3/8	4	6	162798	214.68
.4528	11.5mm	.4528	1-3/8	4	6	162809	214.68
.4530		.4530	1-3/8	4	6	162820	196.76
.4531	29/64	.4531	1-3/8	4	6	162831	171.66
.4540		.4540	1-3/8	4	6	162842	214.68
.4550		.4550	1-3/8	4	6	162853	214.68

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4560		.4560	1-3/8	4	6	162864	214.68
.4570		.4570	1-3/8	4	6	162875	214.68
.4580		.4580	1-3/8	4	6	162886	214.68
.4590		.4590	1-3/8	4	6	162897	214.68
.4600		.4600	1-3/8	4	6	162908	214.68
.4610		.4610	1-3/8	4	6	162919	214.68
.4620		.4620	1-3/8	4	6	162930	214.68
.4630		.4630	1-3/8	4	6	162941	214.68
.4640		.4640	1-3/8	4	6	162952	214.68
.4650		.4650	1-3/8	4	6	162963	214.68
.4660		.4660	1-3/8	4	6	162974	214.68
.4670		.4670	1-3/8	4	6	162985	214.68
.4680		.4680	1-3/8	4	6	162996	214.68
.4688	15/32	.4688	1-3/8	4	6	163007	171.66
.4690		.4690	1-3/8	4	6	163018	226.22
.4700		.4700	1-3/8	4	6	163029	226.22
.4710		.4710	1-3/8	4	6	163040	226.22
.4720		.4720	1-3/8	4	6	163051	226.22
.4724	12mm	.4724	1-3/8	4	6	163062	217.96
.4730		.4730	1-3/8	4	6	163073	226.22
.4740		.4740	1-3/8	4	6	163084	226.22
.4750		.4750	1-3/8	4	6	163095	226.22
.4760		.4760	1-1/2	4	6	163106	226.22
.4770		.4770	1-1/2	4	6	163117	226.22
.4780		.4780	1-1/2	4	6	163128	226.22
.4790		.4790	1-1/2	4	6	163139	226.22
.4800		.4800	1-1/2	4	6	163150	226.22
.4810		.4810	1-1/2	4	6	163161	226.22
.4820		.4820	1-1/2	4	6	163172	226.22
.4830		.4830	1-1/2	4	6	163183	226.22
.4840		.4840	1-1/2	4	6	163194	226.22
.4844	31/64	.4844	1-1/2	4	6	163205	194.48
.4850		.4850	1-1/2	4	6	163216	226.22
.4860		.4860	1-1/2	4	6	163227	226.22
.4870		.4870	1-1/2	4	6	163238	272.79
.4880		.4880	1-1/2	4	6	163249	272.79
.4890		.4890	1-1/2	4	6	163260	272.79
.4900		.4900	1-1/2	4	6	163271	272.79
.4910		.4910	1-1/2	4	6	163282	272.79
.4920		.4920	1-1/2	4	6	163293	272.79
.4921	12.5mm	.4921	1-1/2	4	6	163304	272.79
.4930		.4930	1-1/2	4	6	163315	272.79
.4940		.4940	1-1/2	4	6	163326	272.79
.4950		.4950	1-1/2	4	6	163337	272.79
.4960		.4960	1-1/2	4	6	163348	272.79
.4970		.4970	1-1/2	4	6	163359	272.79
.4980		.4980	1-1/2	4	6	163370	272.79
.4990		.4990	1-1/2	4	6	163381	272.79
.4995		.4995	1-1/2	4	6	163392	272.79
.5000	1/2	.5000	1-1/2	4	6	163403	194.48
.5005		.5005	1-1/2	4	6	163414	272.79
.5010		.5010	1-1/2	4	6	163425	272.79
.5020		.5020	1-1/2	4	6	163436	272.79

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

# Carbide Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



## SPECIAL SIZES PRICES INCLUDE THE FOLLOWING STYLES:

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

SIZE RANGE	SHANK 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	262.35	173.57	151.36	96.87	76.69	68.62	64.58	60.53	56.51
.0451 - .0500	0.042	3/8	1-1/2	262.35	173.57	151.36	96.87	76.69	68.62	64.58	60.53	56.51
.0501 - .0570	0.046	3/8	1-1/2	264.36	175.56	153.37	98.88	78.71	70.63	66.59	62.56	58.54
.0571 - .0650	0.053	3/8	1-1/2	262.35	173.57	151.36	96.87	76.69	68.62	64.58	60.53	56.51
.0651 - .0800	0.060	1/2	1-3/4	264.36	175.56	153.37	98.88	78.71	70.63	66.59	62.56	58.54
.0801 - .0950	0.075	1/2	2	266.40	177.59	155.39	100.91	80.72	72.66	68.62	64.58	60.53
.0951 - .1150	0.090	5/8	2-1/4	270.42	181.62	159.42	104.94	84.75	76.69	72.66	68.62	64.58
.1151 - .1300	0.110	5/8	2-1/4	272.44	183.63	161.44	106.96	86.78	78.71	74.66	70.63	66.59
.1301 - .1450	0.125	3/4	2-1/2	278.48	189.69	167.51	113.01	92.85	84.75	80.72	76.69	72.66
.1451 - .1600	0.140	3/4	2-1/2	284.56	195.75	173.57	119.07	98.88	90.81	86.78	82.74	78.71
.1601 - .1750	0.155	7/8	2-3/4	290.60	201.81	179.59	125.11	104.94	96.87	92.85	88.80	84.75
.1751 - .1950	0.170	7/8	2-3/4	298.68	209.87	187.69	133.19	113.01	104.94	100.91	96.87	92.85
.1951 - .2100	0.188	1	3	314.81	226.02	203.84	149.34	129.16	121.09	117.05	113.01	108.97
.2101 - .2250	0.205	1	3	320.88	232.08	209.87	155.39	135.22	127.13	123.11	119.07	115.01
.2251 - .2400	0.220	1	3	330.96	242.18	219.98	165.48	145.31	137.22	133.19	129.16	125.11
.2401 - .2550	0.235	1	3	339.03	250.23	228.04	173.57	153.37	145.31	141.25	137.22	133.19
.2551 - .2750	0.250	1	3-1/4	359.23	270.42	248.21	193.74	173.57	165.48	161.44	157.42	153.37
.2751 - .2950	0.270	1-1/8	3-1/4	361.22	272.44	250.23	195.75	175.56	167.51	163.46	159.42	155.39
.2951 - .3150	0.290	1-1/8	3-1/4	381.40	292.60	270.42	215.93	195.75	187.69	183.63	179.59	175.56
.3151 - .3350	0.313	1-1/4	3-1/2	409.66	320.88	298.68	244.19	224.01	215.93	211.90	207.86	203.84
.3351 - .3550	0.330	1-1/4	3-1/2	413.69	328.94	302.72	248.21	228.04	219.98	215.93	211.90	207.86
.3551 - .3800	0.350	1-1/4	3-1/2	421.77	337.02	310.78	256.31	236.11	228.04	224.01	219.98	215.93
.3801 - .4100	0.375	1-1/4	4	452.04	363.26	341.05	286.57	266.40	258.30	254.28	250.23	246.20
.4101 - .4400	0.405	1-3/8	4	468.18	379.41	357.20	302.72	282.53	274.46	270.42	266.40	262.35
.4401 - .4700	0.438	1-3/8	4	492.40	403.62	381.40	326.93	306.74	298.68	294.64	290.60	286.57
.4701 - .5050	0.465	1-1/2	4	532.77	443.98	421.77	367.28	347.10	339.03	335.01	330.96	326.93
.5051 - .5400	0.500	1-1/2	4-1/2	585.24	496.45	474.25	419.77	399.58	391.50	387.47	383.44	379.41
.5401 - .5800	0.535	1-1/2	4-1/2	665.96	577.15	554.98	500.48	480.30	472.24	468.18	464.15	460.12
.5801 - .6260	0.575	1-3/4	4-1/2	730.55	641.75	619.54	565.06	544.88	536.81	532.77	528.73	524.70
.6261 - .6600	0.615	1-3/4	4-1/2	827.41	738.61	716.42	661.93	641.75	633.66	629.63	625.61	621.57
.6601 - .7050	0.655	2	5	948.50	859.71	837.50	783.01	762.84	754.75	750.72	746.70	742.65
.7051 - .7550	0.700	2	5	1,029.20	940.43	918.21	863.73	843.55	835.46	831.44	827.41	823.38
.7551 - .7950	0.750	2	5	1,109.92	1,021.15	998.93	944.45	924.27	916.21	912.16	908.13	904.09
.7951 - .8450	0.750	2-1/4	5	1,190.66	1,101.87	1,079.67	1,025.18	1,005.01	996.92	992.88	988.86	984.82
.8451 - .9000	0.750	2-1/4	5	1,352.11	1,263.33	1,241.12	1,186.63	1,166.46	1,158.36	1,154.33	1,150.31	1,146.27
.9001 - .9600	0.875	2-1/4	5	1,553.92	1,465.12	1,442.93	1,388.43	1,368.24	1,360.17	1,356.14	1,352.11	1,348.07
.9601 - 1.025	0.875	2-1/4	5	1,715.35	1,626.57	1,604.37	1,549.88	1,529.69	1,521.63	1,517.59	1,513.54	1,509.51

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

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MADE IN USA

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THREADMILLS  
DRILL MILLS  
CHAMFER MILLS  
DRILLS  
REAMERS  
BURS



## SA - CYLINDRICAL



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SA-61	1/16	3/32	1/4	1-1/2	260750	10.13	260585	10.13
*SA-41	1/16	1/8	1/4	1-1/2	122461	9.60	122131	9.60
*SA-41L2	1/16	1/8	1/4	2	260761	14.38	260596	14.38
*SA-41L3	1/16	1/8	1/4	3	260772	15.92	260607	15.92
*SA-63	3/32	3/32	3/8	1-1/2	260783	10.13	260618	10.13
*SA-42	3/32	1/8	7/16	1-1/2	122483	9.60	122153	9.60
*SA-42L2	3/32	1/8	7/16	2	260794	14.38	260629	14.38
*SA-42L3	3/32	1/8	7/16	3	260805	15.92	260640	15.92
*SA-43	1/8	1/8	9/16	1-1/2	122505	9.60	122175	9.60
*SA-43L2	1/8	1/8	9/16	2	260816	14.38	260651	14.38
*SA-43L3	1/8	1/8	9/16	3	260827	15.92	260662	15.92
*SA-11	1/8	1/4	1/2	2	122593	19.06	122263	19.06
*SA-12	1/8	1/4	5/8	2	260838	19.15	260673	19.15
SA-52	5/32	1/8	1/2	2	122527	21.12	122197	21.12
*SA-13	5/32	1/4	5/8	2	129171	26.41	128973	26.41
SA-53	3/16	1/8	1/2	2	122549	21.12	122219	21.12
*SA-81	3/16	3/16	1/2	2	260849	23.19	260684	23.19
*SA-14	3/16	1/4	5/8	2	122615	22.80	122285	22.80
SA-51	1/4	1/8	1/2	2	122571	14.24	122241	14.24
*SA-1	1/4	1/4	5/8	2	122637	16.15	122307	16.15
SA-1L6	1/4	1/4	1/2	6-1/2	127829	32.73	127763	32.73
*SA-1L	1/4	1/4	1	2	260860	24.94	260695	24.94
SA-2	5/16	1/4	3/4	2-1/2	122659	29.82	122329	29.82
SA-3	3/8	1/4	3/4	2-1/2	122681	19.99	122351	19.99
SA-3L6	3/8	1/4	3/4	6-3/4	127851	46.11	127785	46.11
SA-3L	3/8	1/4	1	2-3/4	260871	30.78	260706	30.78
SA-3X	3/8	1/4	1-1/2	3-1/4	260882	43.78	260717	43.78
SA-4	7/16	1/4	1	2-3/4	122703	46.34	122373	46.34
SA-5	1/2	1/4	1	2-3/4	122725	31.90	122395	31.90
SA-5L6	1/2	1/4	1	7	127873	72.05	127807	72.05
SA-6	5/8	1/4	1	2-3/4	122747	45.99	122417	45.99
SA-15	3/4	1/4	1/2	2-1/4	260893	70.04	260728	70.04
SA-16	3/4	1/4	3/4	2-1/2	260904	70.04	260739	70.04
SA-7	3/4	1/4	1	2-3/4	122769	71.71	122439	71.71
SA-9	1	1/4	1	2-3/4	129193	113.23	128995	113.23

\* Carbide One-Piece

## SA - CYLINDRICAL - FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
*SA-1NF	1/4	1/4	5/8	2	—	—	128423	23.37
SA-3NF	3/8	1/4	3/4	2-1/2	—	—	128445	32.67
SA-5NF	1/2	1/4	1	2-3/4	—	—	128467	54.56
SA-6NF	5/8	1/4	1	2-3/4	—	—	128489	81.09
SA-7NF	3/4	1/4	1	2-3/4	—	—	128511	106.54

\* Carbide One-Piece

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

# Carbide Burs

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## SB - CYLINDRICAL END CUT



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SB-41	1/16	1/8	1/4	1-1/2	129259	12.94	122791	12.94
*SB-41L2	1/16	1/8	1/4	2	261278	15.81	261135	15.81
*SB-41L3	1/16	1/8	1/4	3	261289	17.51	261146	17.51
*SB-42	3/32	1/8	7/16	1-1/2	129237	10.23	122813	10.23
*SB-42L2	3/32	1/8	7/16	2	261300	15.81	261157	15.81
*SB-42L3	3/32	1/8	7/16	3	261311	17.51	261168	17.51
*SB-ECO	1/8	1/8	-	1-1/2	-	-	261179	7.43
*SB-43	1/8	1/8	9/16	1-1/2	129215	9.36	122835	9.36
*SB-43L2	1/8	1/8	9/16	2	261333	15.81	261190	15.81
*SB-43L3	1/8	1/8	9/16	3	261344	17.51	261201	17.51
*SB-11	1/8	1/4	1/2	2	123077	24.67	122901	24.67
*SB-12	1/8	1/4	5/8	2	261355	21.01	261212	21.01
*SB-13	5/32	1/4	5/8	2	129281	29.79	129017	29.79
*SB-14	3/16	1/4	5/8	2	123099	24.67	122923	24.67
SB-51	1/4	1/8	3/16	1-11/16	123033	14.28	122857	14.28
SB-51	1/4	1/8	1/2	2	123055	15.55	122879	15.55
*SB-1	1/4	1/4	5/8	2	123121	19.16	122945	19.16
*SB-1L	1/4	1/4	1	2	261366	27.43	261223	27.43
SB-2	5/16	1/4	3/4	2-1/2	123143	32.80	122967	32.80
SB-3	3/8	1/4	3/4	2-1/2	123165	22.87	122989	22.87
SB-3L	3/8	1/4	1	2-3/4	261377	33.80	261234	33.80
SB-3X	3/8	1/4	1-1/2	3-1/4	261388	44.68	261245	44.68
SB-4	7/16	1/4	1	2-3/4	123187	52.66	129039	52.66
SB-5	1/2	1/4	1	2-3/4	123209	35.11	123011	35.11
SB-6	5/8	1/4	1	2-3/4	123231	51.45	129369	51.45
SB-15	3/4	1/4	1/2	2-1/4	261399	76.74	261256	76.74
SB-16	3/4	1/4	3/4	2-1/2	261410	76.74	261267	76.74
SB-7	3/4	1/4	1	2-3/4	123253	79.01	129061	79.01
SB-9	1	1/4	1	2-3/4	129303	123.58	129083	123.58

\* Carbide One-Piece

## SB - CYLINDRICAL - FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM#	LIST PRICE
SB-3NF	3/8	1/4	3/4	2-1/2	-	-	261421	36.93
SB-5NF	1/2	1/4	1	2-3/4	-	-	261432	56.65
SB-6NF	5/8	1/4	1	2-3/4	-	-	261443	78.28
SB-7NF	3/4	1/4	1	2-3/4	-	-	261454	114.61

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

MADE IN USA

## SC - CYLINDRICAL BALL NOSE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SC-61	3/32	3/32	3/8	1-1/2	261025	10.13	260915	10.13
*SC-41	3/32	1/8	7/16	1-1/2	123583	9.60	123275	9.60
*SC-42	1/8	1/8	9/16	1-1/2	123605	9.60	123297	9.60
*SC-42L2	1/8	1/8	9/16	2	261036	14.38	260926	14.38
*SC-42L3	1/8	1/8	9/16	3	261047	15.92	260937	15.92
*SC-11	1/8	1/4	1/2	2	123693	26.51	123385	26.51
*SC-12	1/8	1/4	5/8	2	261058	20.32	260948	20.32
SC-52	5/32	1/8	1/2	2	123627	21.12	123319	21.12
*SC-13	5/32	1/4	5/8	2	129325	30.33	129105	30.33
SC-53	3/16	1/8	1/2	2	123649	21.12	123341	21.12
*SC-81	3/16	3/16	1/2	2	261069	23.19	260959	23.19
*SC-14	3/16	1/4	5/8	2	123715	26.51	123407	26.51
SC-51	1/4	1/8	1/2	2	123671	14.28	123363	14.28
*SC-1	1/4	1/4	5/8	2	123737	19.19	123429	19.19
*SC-1L	1/4	1/4	1	2	261080	24.94	260970	24.94
SC-1L6	1/4	1/4	1/2	6-1/2	127961	38.12	127895	38.12
SC-2	5/16	1/4	3/4	2-1/2	123759	32.23	123451	32.23
SC-3	3/8	1/4	3/4	2-1/2	123781	23.20	123473	23.20
SC-3L	3/8	1/4	1	2-3/4	261091	33.69	260981	33.69
SC-3L6	3/8	1/4	3/4	6-3/4	127983	51.36	127917	51.36
SC-3X	3/8	1/4	1-1/2	3-1/4	261102	39.58	260992	39.58
SC-4	7/16	1/4	1	2-3/4	123803	50.92	123495	50.92
SC-5	1/2	1/4	1	2-3/4	123825	35.98	123517	35.98
SC-5L6	1/2	1/4	1	7	128005	80.81	127939	80.81
SC-6	5/8	1/4	1	2-3/4	123847	53.60	123539	53.60
SC-15	3/4	1/4	1/2	2-1/4	261113	75.19	261003	75.19
SC-16	3/4	1/4	3/4	2-1/2	261124	75.19	261014	75.19
SC-7	3/4	1/4	1	2-3/4	123869	77.25	123561	77.25
SC-9	1	1/4	1	2-3/4	129457	116.81	129435	116.81

\* Carbide One-Piece

## SC - CYLINDRICAL BALL NOSE FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
*SC-1NF	1/4	1/4	5/8	2	—	—	128533	23.00
SC-3NF	3/8	1/4	3/4	2-1/2	—	—	128555	30.66
SC-5NF	1/2	1/4	1	2-3/4	—	—	128577	43.46
SC-7NF	3/4	1/4	1	2-3/4	—	—	128599	105.35

\* Carbide One-Piece

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

## SD - BALL SHAPE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SD-40	1/16	1/8	1/16	1-1/2	260255	10.14	126267	10.14
*SD-61	3/32	3/32	3/32	1-1/2	260266	10.13	260189	10.13
*SD-41	3/32	1/8	3/32	1-1/2	126531	9.60	126289	9.60
*SD-42	1/8	1/8	1/8	1-1/2	126553	9.60	129127	9.60
*SD-42L2	1/8	1/8	1/8	2	260277	14.38	260200	14.38
*SD-42L3	1/8	1/8	1/8	3	260288	15.92	260211	15.92
*SD-11	1/8	1/4	1/8	2	126619	24.34	126333	24.34
SD-52	5/32	1/8	5/32	1-21/32	260299	19.57	260222	19.57
SD-53	3/16	1/8	3/16	1-11/16	126575	21.12	260233	21.12
*SD-81	3/16	3/16	5/32	2	260310	23.19	260244	23.19
*SD-14	3/16	1/4	3/16	2	126641	24.34	126355	24.34
SD-51	1/4	1/8	1/4	1-3/4	126597	14.24	126311	14.24
*SD-1	1/4	1/4	1/4	2	126663	18.66	126377	18.66
SD-1L6	1/4	1/4	1/4	6-1/4	128093	35.14	128027	35.14
SD-2	5/16	1/4	5/16	2-1/16	126685	26.21	126399	26.21
SD-3	3/8	1/4	3/8	2-1/8	126707	19.99	126421	19.99
SD-3L6	3/8	1/4	3/8	6-3/8	128115	42.26	128049	42.26
SD-4	7/16	1/4	7/16	2-3/16	126729	33.84	126443	33.84
SD-5	1/2	1/4	1/2	2-1/2	126751	27.12	126465	27.12
SD-5L6	1/2	1/4	1/2	6-1/2	128137	56.94	128071	56.94
SD-6	5/8	1/4	5/8	2-3/8	126773	42.22	126487	42.22
SD-7	3/4	1/4	3/4	2-1/2	126795	58.25	126509	58.25
SD-9	1	1/4	1	2-3/4	129347	123.58	129149	123.58

\* Carbide One-Piece

## SD - BALL SHAPE FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
*SD-1NF	1/4	1/4	1/4	2	—	—	128885	22.67
SD-3NF	3/8	1/4	3/8	2-1/8	—	—	128907	28.65
SD-5NF	1/2	1/4	1/2	2-13/64	—	—	128929	47.01
SD-6NF	5/8	1/4	5/8	2-5/16	—	—	128951	70.79

\* Carbide One-Piece

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

## SE - EGG SHAPE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SE-61	3/32	3/32	1/8	1-1/2	260409	10.13	260321	10.13
*SE-41	1/8	1/8	7/32	1-1/2	125695	9.60	125519	9.60
*SE-41L2	1/8	1/8	7/32	2	260420	14.38	260332	14.38
*SE-41L3	1/8	1/8	7/32	3	260431	15.92	260343	15.92
SE-53	3/16	1/8	9/32	1-25/32	125717	21.12	125541	21.12
*SE-81	3/16	3/16	9/32	2	260442	23.19	260354	23.19
*SE-11	3/16	1/4	5/16	2	260453	20.85	260365	20.85
SE-51	1/4	1/8	3/8	1-7/8	125739	14.24	125563	14.24
*SE-1	1/4	1/4	3/8	2	125761	22.80	125585	22.80
SE-1L6	1/4	1/4	3/8	6-3/8	260464	30.78	260376	30.78
SE-3	3/8	1/4	5/8	2-3/8	125783	24.01	125607	24.01
SE-3L6	3/8	1/4	5/8	6-5/8	260475	34.49	260387	34.49
SE-5	1/2	1/4	7/8	2-5/8	125805	33.57	125629	33.57
SE-5L6	1/2	1/4	7/8	6-7/8	260486	51.73	260398	51.73
SE-6	5/8	1/4	1	2-3/4	125827	53.02	125651	53.02
SE-7	3/4	1/4	1	2-3/4	125849	74.17	125673	74.17

\* Carbide One-Piece

## SE - EGG SHAPE FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM #	LIST PRICE
SE-3NF	3/8	1/4	5/8	2-3/8	—	—	128731	31.83
SE-5NF	1/2	1/4	7/8	2-5/8	—	—	128753	55.40
SE-6NF	5/8	1/4	1	2-3/4	—	—	128775	78.48
SE-7NF	3/4	1/4	1	2-3/4	—	—	128797	112.31



FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.



## SF - ROUND NOSE TREE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SF-61	3/32	3/32	1/4	1-1/2	260541	10.13	260497	10.13
*SF-41	1/8	1/8	1/4	1-1/2	124177	9.60	123891	9.60
*SF-42	1/8	1/8	1/2	1-1/2	124199	9.60	123913	9.60
*SF-42L2	1/8	1/8	1/2	2	260552	14.38	260508	14.38
*SF-42L3	1/8	1/8	1/2	3	260563	15.92	260519	15.92
SF-53	3/16	1/8	1/2	2	124221	21.12	123935	21.12
*SF-81	3/16	3/16	1/2	2	260574	23.19	260530	23.19
SF-51	1/4	1/8	1/2	2	124243	14.24	123957	14.24
*SF-1	1/4	1/4	3/4	2	124265	20.80	123979	20.80
SF-1L6	1/4	1/4	1/2	6-1/2	128225	39.75	128159	39.75
SF-3	3/8	1/4	3/4	2-1/2	124287	23.20	124001	23.20
SF-3L6	3/8	1/4	3/4	6-3/4	128247	50.35	128181	50.35
SF-4	7/16	1/4	1	2-3/4	124309	48.51	124023	48.51
SF-13	1/2	1/4	3/4	2-1/2	124331	51.66	124045	51.66
SF-5	1/2	1/4	1	2-3/4	124353	34.84	124067	34.84
SF-5L6	1/2	1/4	1	7	128269	74.26	128203	74.26
SF-6	5/8	1/4	1	2-3/4	124375	53.33	124089	53.33
SF-7	3/4	1/4	1	2-3/4	124397	74.52	124111	74.52
SF-14	3/4	1/4	1-1/4	3	124419	135.69	124133	135.69
SF-15	3/4	1/4	1-1/2	3-1/4	124441	159.34	124155	159.34

\* Carbide One-Piece

## SF - ROUND NOSE TREE FOR ALUMINUM



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT ITEM#	LIST PRICE
*SF-1NF	1/4	1/4	3/4	2	—	—	128621	23.44
SF-3NF	3/8	1/4	3/4	2-1/2	—	—	128643	30.99
SF-5NF	1/2	1/4	1	2-3/4	—	—	128665	54.83
SF-6NF	5/8	1/4	1	2-3/4	—	—	128687	83.67
SF-14NF	3/4	1/4	1-1/4	3	—	—	128709	101.78

\* Carbide One-Piece

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

## SG - POINTED TREE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SG-61	3/32	3/32	1/4	1-1/2	261553	10.13	261465	10.13
*SG-41	1/8	1/8	1/4	1-1/2	124749	9.56	124463	9.56
*SG-42	1/8	1/8	5/16	1-1/2	124771	9.56	124485	9.56
*SG-43	1/8	1/8	3/8	1-1/2	124793	9.56	124507	9.56
*SG-44	1/8	1/8	1/2	1-1/2	124815	13.31	124529	13.31
*SG-44L2	1/8	1/8	1/2	2	261564	14.38	261476	14.38
*SG-44L3	1/8	1/8	1/2	3	261575	15.92	261487	15.92
SG-53	3/16	1/8	1/2	2	124837	21.12	124551	21.12
*SG-81	3/16	3/16	1/2	2	261586	23.19	261498	23.19
SG-51	1/4	1/8	1/2	2	124859	14.24	124573	14.24
*SG-1	1/4	1/4	5/8	2	124881	21.20	124595	21.20
SG-1L6	1/4	1/4	1/2	6-1/2	261597	29.08	261509	29.08
SG-2	5/16	1/4	3/4	2-1/2	124903	33.60	124617	33.60
SG-3	3/8	1/4	3/4	2-1/2	124925	23.91	124639	23.91
SG-3L6	3/8	1/4	3/4	6-3/4	261608	36.61	261520	36.61
SG-13	1/2	1/4	3/4	2-1/2	124947	50.69	124661	50.69
SG-5	1/2	1/4	1	2-3/4	124969	35.11	124683	35.11
SG-5L6	1/2	1/4	1	7	261619	47.75	261531	47.75
SG-6	5/8	1/4	1	2-3/4	124991	54.44	124705	54.44
SG-7	3/4	1/4	1	2-3/4	125013	72.86	124727	72.86
SG-15	3/4	1/4	1-1/2	3-1/4	261630	87.55	261542	87.55

\* Carbide One-Piece

## SH - FLAME SHAPE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SH-41	1/8	1/8	1/4	1-1/2	126949	9.60	126817	9.60
*SH41L2	1/8	1/8	1/4	2	261685	14.38	261641	14.38
*SH41L3	1/8	1/8	1/4	3	261696	15.92	261652	15.92
SH-53	3/16	1/8	3/8	1-7/8	126971	21.12	126839	21.12
*SH-1	1/4	1/4	5/8	2	129523	22.53	129501	22.53
SH-2	5/16	1/4	3/4	2-1/2	126993	25.98	126861	25.98
SH-2L6	5/16	1/4	3/4	6-3/4	261707	34.48	261663	34.49
SH-5	1/2	1/4	1-1/4	3	127015	50.35	126883	50.35
SH-5L6	1/2	1/4	1-1/4	7-1/4	261718	55.71	261674	55.71
SH-6	5/8	1/4	1-7/16	3-3/16	127037	118.69	126905	118.69
SH-7	3/4	1/4	1-5/8	3-3/8	127059	150.80	126927	150.80

\* Carbide One-Piece

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# Carbide Burs

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## SJ - 60° INCLUDED ANGLE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SJ-42	1/8	1/8	3/32	1-1/2	127675	9.60	127587	9.60
*SJ-1	1/4	1/4	3/16	2	127697	18.66	127609	18.66
SJ-3	3/8	1/4	5/16	2-3/16	127719	22.87	127631	22.87
SJ-5	1/2	1/4	7/16	2-19/64	127741	31.36	127653	31.36
SJ-6	5/8	1/4	9/16	2-5/16	261762	37.83	261729	37.83
SJ-7	3/4	1/4	11/16	2-7/16	261773	49.61	261740	49.61
SJ-9	1	1/4	15/16	2-11/16	261784	99.81	261751	99.81

\* Carbide One-Piece

## SK - 90° INCLUDED ANGLE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SK-42	1/8	1/8	1/16	1-1/2	127499	9.60	127411	9.60
*SK-1	1/4	1/4	1/8	2	127521	18.66	127433	18.66
SK-3	3/8	1/4	3/16	2-1/16	127543	19.29	127455	19.29
SK-5	1/2	1/4	1/4	2-1/8	127565	30.22	127477	30.22
SK-6	5/8	1/4	5/16	2-3/16	261817	37.83	261795	37.83
SK-7	3/4	1/4	3/8	2-1/4	129413	61.56	129391	61.56
SK-9	1	1/4	1/2	2-1/4	261828	93.76	261806	93.76

\* Carbide One-Piece



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101

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CHAMFER MILLS

DRILLS

REAMERS

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## SL - INCLUDED ANGLE WITH RADIUS END



TOOL #	SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SL-41	1/8	1/8	3/8	1-1/2	8°	126069	9.56	125871	9.56
*SL-42	1/8	1/8	1/2	1-1/2	8°	126091	9.56	125893	9.56
*SL-42L2	1/8	1/8	1/2	2	8°	261872	14.38	261839	14.38
*SL-42L3	1/8	1/8	1/2	3	8°	261883	15.92	261850	15.92
SL-53	3/16	1/8	1/2	2	14°	126113	21.12	125915	21.12
*SL-81	3/16	3/16	7/16	2	14°	261894	23.19	261861	23.19
*SL-1	1/4	1/4	5/8	2	14°	126135	19.43	125937	19.43
SL-1L6	1/4	1/4	5/8	6-1/2	14°	128357	40.72	128291	40.72
SL-2	5/16	1/4	7/8	2-3/4	14°	126157	37.15	125959	37.15
SL-3	3/8	1/4	1-1/16	2-15/16	14°	126179	26.88	125981	26.88
SL-3L6	3/8	1/4	1-1/16	7-1/16	14°	128379	64.16	128313	64.16
SL-4	1/2	1/4	1-1/8	3	14°	126201	54.46	126003	54.46
SL-4L6	1/2	1/4	1-1/8	7-1/8	14°	128401	78.60	128335	78.60
SL-6	5/8	1/4	1-5/16	3-3/16	14°	126223	87.36	126025	87.36
SL-7	3/4	1/4	1-1/2	3-3/8	14°	126245	119.54	126047	119.54

\* Carbide One-Piece

## SL - INCLUDED ANGLE WITH RADIUS END - FOR ALUMINUM



TOOL #	SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	—	—	ALUMA CUT ITEM#	LIST PRICE
SL-4NF	1/2	1/4	1-1/8	3	14°	—	—	128819	54.97
SL-6NF	5/8	1/4	1-5/16	3-3/16	14°	—	—	128841	110.70
SL-7NF	3/4	1/4	1-1/2	3-3/8	14°	—	—	128863	137.50

## SM - POINTED CONE



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM#	LIST PRICE	SINGLE CUT ITEM#	LIST PRICE
*SM-61	3/32	3/32	1/4	1-1/2	260035	10.13	260002	10.13
*SM-41	1/8	1/8	11/32	1-1/2	125277	9.60	125035	9.60
*SM-42	1/8	1/8	7/16	1-1/2	125299	9.60	125057	9.60
*SM-42L2	1/8	1/8	7/16	2	260046	14.38	260013	14.38
*SM-42L3	1/8	1/8	7/16	3	260057	15.92	260024	15.92
*SM-43	1/8	1/8	5/8	1-1/2	125321	9.60	125079	9.60
SM-53	3/16	1/8	1/2	2	125343	21.12	125101	21.12
SM-51	1/4	1/8	1/2	2-1/8	125365	14.24	125123	14.24
*SM-1	1/4	1/4	1/2	2	125387	18.26	125145	18.26
*SM-2	1/4	1/4	3/4	2	125409	28.29	125167	28.29
*SM-3	1/4	1/4	1	2	125431	20.40	125189	20.40
SM-4	3/8	1/4	5/8	2-1/2	125453	27.18	125211	27.18
SM-5	1/2	1/4	7/8	2-3/4	125475	38.05	125233	38.05
SM-6	5/8	1/4	1	2-7/8	125497	85.93	125255	85.93

\* Carbide One-Piece

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 199.

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# Carbide Burs

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## SN - INVERTED TAPER



TOOL #	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT ITEM #	LIST PRICE	SINGLE CUT ITEM #	LIST PRICE
*SN-61	3/32	3/32	1/8	1-1/2	260123	10.13	260068	10.13
*SN-41	3/32	1/8	1/8	1-1/2	260134	9.60	127081	9.60
*SN-42	1/8	1/8	3/16	1-1/2	127213	9.60	127103	9.60
SN-53	3/16	1/8	1/4	1-3/4	127235	21.12	127125	21.12
*SN-81	3/16	3/16	1/4	2	260145	23.19	260079	23.19
SN-51	1/4	1/8	1/4	1-3/4	127257	14.24	127147	14.24
*SN-1	1/4	1/4	5/16	2	127279	18.56	127169	18.56
SN-2	3/8	1/4	3/8	2-1/8	260156	26.11	260090	26.11
SN-4	1/2	1/4	1/2	2-1/4	127301	54.16	127191	54.16
SN-6	5/8	1/4	3/4	2-1/2	260167	47.91	260101	47.91
SN-7	3/4	1/4	5/8	2-3/8	260178	57.84	260112	57.84

\* Carbide One-Piece

## CARBIDE BUR SETS



#127323



#129545

SET SIZES	# OF PCS. IN SET	DIA.	SHANK DIAMETER	CASE TYPE	TYPE	ITEM#	LIST PRICE
SA-42, SA-43, SC-41, SC-42, SD-42, SE-41, SF-42, SG-42, SM-43	9 PCS.	1/8	1/8	WOOD	DOUBLE CUT	127323	141.36
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	151.99
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	231.57
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	415.52
SC-3, SD-3, SF-3, SG-3, SA-5, SC-5, SF-5, SL-4	8 PCS.	-	1/4	WOOD	DOUBLE CUT	129479	267.58
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	266.17

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103

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**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	21.89
3/16	3/16	2	1	118853	118941	119029	216324	23.39
1/4	1/4	2	1	118864	118952	119040	216335	26.57
3/8	1/4	2-5/8	1	118875	118963	119051	216346	48.11
1/2	1/4	2-5/8	1	118886	118974	119062	216357	59.59
5/8	3/8	2-3/4	1	118897	118985	119073	216368	87.06
3/4	3/8	2-3/4	1	118908	118996	119084	216379	119.17
1	1/2	3	1	118919	119007	119095	216390	182.41



**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	21.89
3/16	3/16	2	1	119117	119205	119293	216412	23.39
1/4	1/4	2	1	119128	119216	119304	216423	26.57
3/8	1/4	2-5/8	1	119139	119227	119315	216434	48.11
1/2	1/4	2-5/8	1	119150	119238	119326	216445	59.59
5/8	3/8	2-3/4	1	119161	119249	119337	216456	87.06
3/4	3/8	2-3/4	1	119172	119260	119348	216467	119.17
1	1/2	3	1	119183	119271	119359	216478	182.41



**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	21.89
3/16	3/16	2	1	119491	119579	119667	216500	23.39
1/4	1/4	2	1	119502	119590	119678	216511	26.57
3/8	1/4	2-5/8	1	119513	119601	119689	216522	48.11
1/2	1/4	2-5/8	1	119524	119612	119700	216533	59.59
5/8	3/8	2-3/4	1	119535	119623	119711	216544	87.06
3/4	3/8	2-3/4	1	119546	119634	119722	216555	119.17
1	1/2	3	1	119557	119645	119733	216566	182.41

# Combined Drill & Countersinks

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## 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	29.73
0	1/32	1/8	1-1/2	1	216291	28.41
1	3/64	1/8	1-1/2	1	118776	25.86
2	5/64	3/16	2	1	118787	38.48
3	7/64	1/4	2	1	118798	43.40
4	1/8	5/16	2-1/8	1	118809	56.02
5	3/16	7/16	2-3/4	1	118820	88.81
6	7/32	1/2	3	1	118831	110.55



**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	37.13
0	1/32	1/8	1-1/2	1	118834	35.52
1	3/64	1/8	1-1/2	1	118835	32.31
2	5/64	3/16	2	1	118836	48.11
3	7/64	1/4	2	1	118837	54.23
4	1/8	5/16	2-1/8	1	118838	70.03
5	3/16	7/16	2-3/4	1	118839	111.02
6	7/32	1/2	3	1	118840	138.20

## HIGH SPEED STEEL & COBALT



**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	12.90
1	3/64	1/8	1-1/4	12	118578	9.02
2	5/64	3/16	1-7/8	12	118589	9.43
3	7/64	1/4	2	12	118600	9.84
4	1/8	5/16	2-1/8	12	118611	10.13
5	3/16	7/16	2-3/4	12	118622	16.05
6	7/32	1/2	3	1	118633	24.11
7	1/4	5/8	3-1/4	1	118644	36.64
8	5/16	3/4	3-1/2	1	118655	50.29



**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	17.94
0	1/32	1/8	1-1/4	12	119458	17.94
1	3/64	1/8	1-1/4	12	119370	14.31
2	5/64	3/16	1-7/8	12	119381	14.70
3	7/64	1/4	2	12	119392	20.02
4	1/8	5/16	2-1/8	12	119403	20.64
5	3/16	7/16	2-3/4	12	119414	28.74
6	7/32	1/2	3	1	119425	45.87
7	1/4	5/8	3-1/4	1	119436	65.93
8	5/16	3/4	3-1/2	1	119447	106.09

## 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	14.85
0000	.015	1/8	1-1/4	12	118556	13.65
000	.020	1/8	1-1/4	12	118545	12.90
00	.025	1/8	1-1/4	12	118534	12.90

## 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	25.56
2	5/64	3/16	1-7/8	12	118743	26.39
3	7/64	1/4	2	12	118754	27.25
4	1/8	5/16	2-1/8	12	118765	28.37

FOR COATING INFORMATION SEE PAGE 5.

MADE IN USA

105

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	22.62
1x4	3/64	1/8	1	119843	23.60
1x5	3/64	1/8	1	119854	32.79
1x6	3/64	1/8	1	119865	42.96
2x3	5/64	3/16	1	119876	22.87
2x4	5/64	3/16	1	119887	25.88
2x5	5/64	3/16	1	119898	33.13
2x6	5/64	3/16	1	119909	43.09
3x3	7/64	1/4	1	119920	23.90
3x4	7/64	1/4	1	119931	27.25
3x5	7/64	1/4	1	119942	35.84
3x6	7/64	1/4	1	119953	43.47
4x4	1/8	5/16	1	119975	30.21

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	ITEM#	LIST PRICE
4x5	1/8	5/16	1	119986	38.58
4x6	1/8	5/16	1	119997	44.59
4-1/2x4	9/64	3/8	1	119964	33.95
4-1/2x5	9/64	3/8	1	120008	49.40
4-1/2x6	9/64	3/8	1	120052	55.21
5x4	3/16	7/16	1	120019	39.66
5x5	3/16	7/16	1	120030	45.92
5x6	3/16	7/16	1	120041	51.54
6x5	7/32	1/2	1	120063	49.35
6x6	7/32	1/2	1	120074	59.65
7x6	1/4	5/8	1	120085	111.11
8x6	5/16	3/4	1	120096	134.35
-	-	-	-	-	-

## 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	11.16
12	1/16	3/16	1-7/8	12	119755	11.72
13	3/32	1/4	2	12	119766	11.85
14	7/64	5/16	2-1/8	12	119777	12.23
15	5/32	7/16	2-3/4	12	119788	18.63
16	3/16	1/2	3	1	119799	28.75
17	7/32	5/8	3-1/4	1	119810	54.44
18	1/4	3/4	3-1/2	1	119821	72.18

## 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	76.70
5/8	1/2	4	1	113584	86.35
3/4	1/2	4-1/8	1	113595	110.19
7/8	1/2	4-1/4	1	113606	129.52
1	1/2	4-3/8	1	113617	133.86

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	82° - ITEM#	LIST PRICE
1/2	1/2	3-7/8	1	113628	76.70
5/8	1/2	4	1	113639	86.35
3/4	1/2	4-1/8	1	113650	110.19
7/8	1/2	4-1/4	1	113661	129.52
1	1/2	4-3/8	1	113672	133.86

## 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	24.03
3/8 - 60	1/4	1-21/32	1	113419	27.35
1/2 - 60	1/4	1-13/32	1	113430	34.98
3/4 - 60	1/2	1-27/32	1	113441	48.30
1 - 60	1/2	2-13/16	1	113452	75.03

82°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	82° - ITEM#	LIST PRICE
1/4 - 82	3/16	1-7/16	1	113463	24.03
3/8 - 82	1/4	1-21/32	1	113474	27.35
1/2 - 82	1/4	1-13/32	1	113485	34.98
3/4 - 82	1/2	1-27/32	1	113496	48.30
1 - 82	1/2	2-13/16	1	113507	75.03

90°

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	90° - ITEM#	LIST PRICE
1/4 - 90	3/16	1-7/16	1	113518	24.03
3/8 - 90	1/4	1-21/32	1	113529	27.35
1/2 - 90	1/4	1-13/32	1	113540	34.98
3/4 - 90	1/2	1-27/32	1	113551	48.30
1 - 90	1/2	2-13/16	1	113562	75.03

## SQUARE END - 30° HELIX - HSS



**2 FLUTE - UNCOATED**



**2 FLUTE - ALTIN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	2	167550	31.68
5/32	3/8	3/8	2-5/16	2	167561	41.29
3/16	3/8	9/32	2-5/16	2	167572	31.68
7/32	3/8	7/16	2-5/16	2	167583	41.29
1/4	3/8	1/2	2-5/16	2	167594	31.68
9/32	3/8	1/2	2-5/16	2	167605	41.29
5/16	3/8	9/16	2-5/16	2	167616	31.68
3/8	3/8	9/16	2-5/16	2	167627	31.68
7/16	3/8	13/16	2-1/2	2	167638	43.79
1/2	3/8	13/16	2-1/2	2	167649	43.79
1/2	1/2	1	3	2	167660	46.29
9/16	1/2	1-1/8	3-1/8	2	167671	56.51
5/8	1/2	1-1/8	3-1/8	2	167682	63.28
5/8	5/8	1-5/16	3-7/16	2	167693	64.27
3/4	1/2	1-5/16	3-5/16	2	167704	73.47
3/4	5/8	1-5/16	3-7/16	2	167715	73.47
3/4	3/4	1-5/16	3-9/16	2	167726	73.47
13/16	5/8	1-1/2	3-5/8	2	167737	90.35
13/16	3/4	1-1/2	3-3/4	2	167748	90.88
7/8	5/8	1-1/2	3-5/8	2	167759	90.35
7/8	3/4	1-1/2	3-3/4	2	167770	100.68
7/8	7/8	1-1/2	3-3/4	2	167781	100.68
15/16	3/4	1-1/2	3-3/4	2	167803	115.89
15/16	7/8	1-1/2	3-3/4	2	167814	109.42
1	5/8	1-1/2	3-5/8	2	167825	102.46
1	3/4	1-1/2	3-3/4	2	167836	102.46
1	1	1-5/8	4-1/8	2	167858	116.65
1-1/8	7/8	1-5/8	3-7/8	2	167869	179.52
1-1/8	1	1-5/8	4-1/8	2	167880	170.59
1-1/4	7/8	1-5/8	3-7/8	2	167891	179.52
1-1/4	1	1-5/8	4-1/8	2	167902	190.19
1-1/4	1-1/4	1-5/8	4-1/8	2	167913	203.06
1-3/8	1	1-5/8	4-1/8	2	167924	211.65
1-1/2	1	1-5/8	4-1/8	2	167935	227.44
1-1/2	1-1/4	1-5/8	4-1/8	2	167946	227.44

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	# OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	2	167957	39.59
5/32	3/8	3/8	2-5/16	2	167968	51.59
3/16	3/8	9/32	2-5/16	2	167979	39.59
7/32	3/8	7/16	2-5/16	2	167990	51.59
1/4	3/8	1/2	2-5/16	2	168001	39.59
9/32	3/8	1/2	2-5/16	2	168012	51.59
5/16	3/8	9/16	2-5/16	2	168023	39.59
3/8	3/8	9/16	2-5/16	2	168034	39.59
7/16	3/8	13/16	2-1/2	2	168045	54.73
1/2	3/8	13/16	2-1/2	2	168056	54.73
1/2	1/2	1	3	2	168067	57.91
9/16	1/2	1-1/8	3-1/8	2	168078	70.63
5/8	1/2	1-1/8	3-1/8	2	168089	79.10
5/8	5/8	1-5/16	3-7/16	2	168100	80.35
3/4	1/2	1-5/16	3-5/16	2	168111	91.94
3/4	5/8	1-5/16	3-7/16	2	168122	91.94
3/4	3/4	1-5/16	3-9/16	2	168133	91.94
13/16	5/8	1-1/2	3-5/8	2	168144	112.90
13/16	3/4	1-1/2	3-3/4	2	168155	113.28
7/8	5/8	1-1/2	3-5/8	2	168166	112.90
7/8	3/4	1-1/2	3-3/4	2	168177	125.85
7/8	7/8	1-1/2	3-3/4	2	168188	125.85
15/16	3/4	1-1/2	3-3/4	2	168210	144.89
15/16	7/8	1-1/2	3-3/4	2	168221	136.79
1	5/8	1-1/2	3-5/8	2	168232	128.04
1	3/4	1-1/2	3-3/4	2	168243	128.04
1	1	1-5/8	4-1/8	2	168265	145.79
1-1/8	7/8	1-5/8	3-7/8	2	168276	224.41
1-1/8	1	1-5/8	4-1/8	2	168287	213.24
1-1/4	7/8	1-5/8	3-7/8	2	168298	224.33
1-1/4	1	1-5/8	4-1/8	2	168309	237.73
1-1/4	1-1/4	1-5/8	4-1/8	2	168320	253.85
1-3/8	1	1-5/8	4-1/8	2	168331	264.56
1-1/2	1	1-5/8	4-1/8	2	168342	284.32
1-1/2	1-1/4	1-5/8	4-1/8	2	168353	284.32

FOR COATING INFORMATION SEE PAGE 5.

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



# HSS Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## SQUARE END - 30° HELIX - HSS



4 & 6 FLUTE - NON CENTER CUTTING - UNCOATED



4 & 6 FLUTE - NON CENTER CUTTING - ALTIN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	4	169134	32.36
5/32	3/8	3/8	2-5/16	4	169145	44.28
3/16	3/8	1/2	2-3/8	4	169156	32.36
7/32	3/8	1/2	2-3/8	4	169167	44.28
1/4	3/8	5/8	2-7/16	4	169178	32.36
9/32	3/8	11/16	2-1/2	4	169189	44.28
5/16	3/8	3/4	2-1/2	4	169200	32.36
11/32	3/8	3/4	2-1/2	4	169211	45.23
3/8	3/8	3/4	2-1/2	4	169222	32.36
13/32	3/8	3/4	2-1/2	4	169233	66.12
7/16	3/8	1	2-11/16	4	169244	43.68
15/32	3/8	1	2-11/16	4	169255	77.51
1/2	3/8	1	2-11/16	4	169266	43.68
1/2	1/2	1-1/4	3-1/4	4	169277	43.68
17/32	1/2	1-1/4	3-1/4	4	169288	88.79
9/16	1/2	1-3/8	3-3/8	4	169299	56.85
5/8	1/2	1-3/8	3-3/8	4	169310	61.88
5/8	5/8	1-5/8	3-3/4	4	169321	68.77
11/16	1/2	1-5/8	3-5/8	4	169332	71.72
11/16	5/8	1-5/8	3-3/4	4	169343	73.09
3/4	1/2	1-5/8	3-5/8	4	169354	74.26
3/4	5/8	1-5/8	3-3/4	4	169365	74.26
3/4	3/4	1-5/8	3-7/8	4	169376	77.02
13/16	3/4	1-7/8	4-1/8	4	169387	98.22
7/8	3/4	1-7/8	4-1/8	4	169398	97.88
7/8	7/8	1-7/8	4-1/8	4	169409	97.88
15/16	3/4	1-7/8	4-1/8	4	169420	125.70
15/16	7/8	1-7/8	4-1/8	4	169431	118.96
1	3/4	1-7/8	4-1/8	4	169442	111.43
1	7/8	1-7/8	4-1/8	4	169453	118.96
1	1	2	4-1/2	4	169464	117.98
1-1/8	1	2	4-1/2	6	169486	168.35
1-1/4	1	2	4-1/2	6	169508	180.43
1-1/4	1-1/4	2	4-1/2	6	169530	183.95
1-3/8	1	2	4-1/2	6	169541	208.85
1-1/2	1	2	4-1/2	6	169552	225.39
1-1/2	1-1/4	2	4-1/2	4	169563	236.86
1-5/8	1-1/4	2	4-1/2	6	169585	257.98
1-3/4	1-1/4	2	4-1/2	4	169596	312.71
1-3/4	1-1/4	2	4-1/2	6	169607	287.16
2	1-1/4	2	4-1/2	6	169629	419.03

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	4	169640	40.42
5/32	3/8	3/8	2-5/16	4	169651	55.37
3/16	3/8	1/2	2-3/8	4	169662	40.42
7/32	3/8	1/2	2-3/8	4	169673	55.37
1/4	3/8	5/8	2-7/16	4	169684	40.42
9/32	3/8	11/16	2-1/2	4	169695	55.37
5/16	3/8	3/4	2-1/2	4	169706	40.42
11/32	3/8	3/4	2-1/2	4	169717	56.55
3/8	3/8	3/4	2-1/2	4	169728	40.42
13/32	3/8	3/4	2-1/2	4	169739	82.66
7/16	3/8	1	2-11/16	4	169750	54.62
15/32	3/8	1	2-11/16	4	169761	87.20
1/2	3/8	1	2-11/16	4	169772	54.62
1/2	1/2	1-1/4	3-1/4	4	169783	54.62
17/32	1/2	1-1/4	3-1/4	4	169794	111.01
9/16	1/2	1-3/8	3-3/8	4	169805	71.04
5/8	1/2	1-3/8	3-3/8	4	169816	77.36
5/8	5/8	1-5/8	3-3/4	4	169827	85.96
11/16	1/2	1-5/8	3-5/8	4	169838	89.66
11/16	5/8	1-5/8	3-3/4	4	169849	91.37
3/4	1/2	1-5/8	3-5/8	4	169860	92.81
3/4	5/8	1-5/8	3-3/4	4	169871	92.81
3/4	3/4	1-5/8	3-7/8	4	169882	92.81
13/16	3/4	1-7/8	4-1/8	4	169893	122.82
7/8	3/4	1-7/8	4-1/8	4	169904	122.40
7/8	7/8	1-7/8	4-1/8	4	169915	122.40
15/16	3/4	1-7/8	4-1/8	4	169926	157.15
15/16	7/8	1-7/8	4-1/8	4	169937	143.18
1	3/4	1-7/8	4-1/8	4	169948	139.28
1	7/8	1-7/8	4-1/8	4	169959	148.71
1	1	2	4-1/2	4	169970	147.50
1-1/8	1	2	4-1/2	6	169992	209.84
1-1/4	1	2	4-1/2	6	170014	225.54
1-1/4	1-1/4	2	4-1/2	6	170036	229.90
1-3/8	1	2	4-1/2	6	170047	254.12
1-1/2	1	2	4-1/2	6	170058	282.58
1-1/2	1-1/4	2	4-1/2	4	170069	296.17
1-5/8	1-1/4	2	4-1/2	6	170091	323.87
1-3/4	1-1/4	2	4-1/2	4	170102	390.91
1-3/4	1-1/4	2	4-1/2	6	170113	357.60
2	1-1/4	2	4-1/2	6	170135	519.67

FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

109

HSS ENDMILLS  
COBALT ENDMILLS

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



**UNCOATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE
1/8	3/8	3/8	3-1/16	2	166758	48.48
5/32	3/8	7/16	3-1/8	2	166769	51.47
3/16	3/8	7/16	3-1/8	2	166780	48.52
7/32	3/8	1/2	3-1/8	2	166791	51.51
1/4	3/8	1/2	3-1/8	2	166802	48.52
9/32	3/8	9/16	3-1/8	2	166813	51.51
5/16	3/8	9/16	3-1/8	2	166824	48.52
11/32	3/8	9/16	3-1/8	2	166835	51.51
3/8	3/8	9/16	3-1/2	2	166846	48.52
13/32	1/2	13/16	3-3/4	2	166857	78.46
7/16	1/2	13/16	3-3/4	2	166868	73.81
1/2	1/2	13/16	3-3/4	2	166890	73.81
9/16	5/8	1-1/8	4-1/2	2	166901	100.41
5/8	5/8	1-1/8	4-1/2	2	166912	100.41
11/16	3/4	1-5/16	5	2	166923	126.45
3/4	3/4	1-5/16	5	2	166934	126.45
13/16	7/8	1-9/16	5-1/2	2	166945	159.08
7/8	7/8	1-9/16	5-1/2	2	166956	159.08
15/16	1	1-5/8	5-7/8	2	166967	204.95
1	1	1-5/8	5-7/8	2	166978	195.68



**ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	2	166989	60.60
5/32	3/8	7/16	3-1/8	2	167000	64.34
3/16	3/8	7/16	3-1/8	2	167011	60.63
7/32	3/8	1/2	3-1/8	2	167022	64.34
1/4	3/8	1/2	3-1/8	2	167033	60.63
9/32	3/8	9/16	3-1/8	2	167044	64.34
5/16	3/8	9/16	3-1/8	2	167055	60.63
11/32	3/8	9/16	3-1/8	2	167066	64.34
3/8	3/8	9/16	3-1/2	2	167077	60.63
13/32	1/2	13/16	3-3/4	2	167088	98.07
7/16	1/2	13/16	3-3/4	2	167099	92.24
1/2	1/2	13/16	3-3/4	2	167121	92.24
9/16	5/8	1-1/8	4-1/2	2	167132	125.51
5/8	5/8	1-1/8	4-1/2	2	167143	125.51
11/16	3/4	1-5/16	5	2	167154	158.06
3/4	3/4	1-5/16	5	2	167165	158.06
13/16	7/8	1-9/16	5-1/2	2	167176	198.82
7/8	7/8	1-9/16	5-1/2	2	167187	198.82
15/16	1	1-5/8	5-7/8	2	167198	256.20
1	1	1-5/8	5-7/8	2	167209	244.58

FOR COATING INFORMATION SEE PAGE 5.

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

# HSS Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE
1/8	3/8	3/8	3-1/16	4	168672	48.98
5/32	3/8	7/16	3-1/8	4	168683	51.74
3/16	3/8	1/2	3-1/8	4	168694	48.98
7/32	3/8	9/16	3-1/4	4	168705	51.74
1/4	3/8	5/8	3-3/8	4	168716	48.98
9/32	3/8	11/16	3-3/8	4	168727	51.74
5/16	3/8	3/4	3-1/2	4	168738	48.98
11/32	3/8	3/4	3-1/2	4	168749	51.74
3/8	3/8	3/4	3-1/2	4	168760	48.98
13/32	1/2	1	4-1/8	4	168771	76.04
7/16	1/2	1	4-1/8	4	168782	73.96
15/32	1/2	1	4-1/8	4	168793	76.04
1/2	1/2	1	4-1/8	4	168804	73.96
9/16	5/8	1-3/8	5	4	168815	98.71
5/8	5/8	1-3/8	5	4	168826	98.71
11/16	3/4	1-5/8	5-5/8	4	168837	124.30
3/4	3/4	1-5/8	5-5/8	4	168848	124.30
13/16	7/8	1-7/8	6-1/8	4	168859	165.97
7/8	7/8	1-7/8	6-1/8	4	168870	165.97
15/16	1	1-7/8	6-3/8	4	168881	200.98
1	1	1-7/8	6-3/8	4	168892	192.73



ALTIN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ALTIN	LIST PRICE
1/8	3/8	3/8	3-1/16	4	168903	61.24
5/32	3/8	7/16	3-1/8	4	168914	64.65
3/16	3/8	1/2	3-1/8	4	168925	61.24
7/32	3/8	9/16	3-1/4	4	168936	64.65
1/4	3/8	5/8	3-3/8	4	168947	61.24
9/32	3/8	11/16	3-3/8	4	168958	64.65
5/16	3/8	3/4	3-1/2	4	168969	61.24
11/32	3/8	3/4	3-1/2	4	168980	64.65
3/8	3/8	3/4	3-1/2	4	168991	61.24
13/32	1/2	1	4-1/8	4	169002	95.04
7/16	1/2	1	4-1/8	4	169013	92.43
15/32	1/2	1	4-1/8	4	169024	95.04
1/2	1/2	1	4-1/8	4	169035	92.43
9/16	5/8	1-3/8	5	4	169046	123.39
5/8	5/8	1-3/8	5	4	169057	123.39
11/16	3/4	1-5/8	5-5/8	4	169068	155.41
3/4	3/4	1-5/8	5-5/8	4	169079	155.41
13/16	7/8	1-7/8	6-1/8	4	169090	207.49
7/8	7/8	1-7/8	6-1/8	4	169101	207.49
15/16	1	1-7/8	6-3/8	4	169112	251.24
1	1	1-7/8	6-3/8	4	169123	240.76

FOR COATING INFORMATION SEE PAGE 5.

TOLERANCES	DIAMETER		SHANK
	IF SIZE & SHANK DIA. ARE NOT THE SAME	IF SIZE & SHANK DIA. ARE THE SAME	
ALL SIZES	+0.000, -.0015	+0.000, -.0025	+0.001, -.0005

MADE IN USA

## SQUARE END - 30° HELIX - M42 COBALT



**2 FLUTE - UNCOATED**



**2 FLUTE - ALTIN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	2	232142	38.57
3/16	3/8	9/32	2-5/16	2	232164	38.57
1/4	3/8	1/2	2-5/16	2	232186	38.57
5/16	3/8	9/16	2-5/16	2	232208	38.57
3/8	3/8	9/16	2-5/16	2	232219	38.57
7/16	3/8	13/16	2-1/2	2	232230	53.29
1/2	3/8	13/16	2-1/2	2	232241	53.29
1/2	1/2	1	3	2	232252	56.36
9/16	1/2	1-1/8	3-1/8	2	232263	68.77
5/8	1/2	1-1/8	3-1/8	2	232274	77.02
5/8	5/8	1-5/16	3-7/16	2	232285	78.23
3/4	1/2	1-5/16	3-5/16	2	232296	89.44
3/4	5/8	1-5/16	3-7/16	2	232307	89.44
3/4	3/4	1-5/16	3-9/16	2	232318	89.44
13/16	5/8	1-1/2	3-5/8	2	232329	109.95
13/16	3/4	1-1/2	3-3/4	2	232340	110.60
7/8	3/4	1-1/2	3-3/4	2	232362	122.56
7/8	7/8	1-1/2	3-3/4	2	232373	122.56
15/16	5/8	1-1/2	3-5/8	2	232384	133.19
15/16	3/4	1-1/2	3-3/4	2	232395	141.06
1	3/4	1-1/2	3-3/4	2	232428	124.67
1	1	1-5/8	4-1/8	2	232450	141.97
1-1/8	1	1-5/8	4-1/8	2	232472	207.64
1-1/4	1	1-5/8	4-1/8	2	232494	231.48
1-1/2	1-1/4	1-5/8	4-1/8	2	232538	276.87

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	2-5/16	2	232549	48.22
3/16	3/8	9/32	2-5/16	2	232571	48.22
1/4	3/8	1/2	2-5/16	2	232593	48.22
5/16	3/8	9/16	2-5/16	2	232615	48.22
3/8	3/8	9/16	2-5/16	2	232626	48.22
7/16	3/8	13/16	2-1/2	2	232637	66.61
1/2	3/8	13/16	2-1/2	2	232648	66.61
1/2	1/2	1	3	2	232659	70.47
9/16	1/2	1-1/8	3-1/8	2	232670	85.99
5/8	1/2	1-1/8	3-1/8	2	232681	96.29
5/8	5/8	1-5/16	3-7/16	2	232692	97.80
3/4	1/2	1-5/16	3-5/16	2	232703	111.92
3/4	5/8	1-5/16	3-7/16	2	232714	111.92
3/4	3/4	1-5/16	3-9/16	2	232725	111.92
13/16	5/8	1-1/2	3-5/8	2	232736	137.43
13/16	3/4	1-1/2	3-3/4	2	232747	137.92
7/8	3/4	1-1/2	3-3/4	2	232769	153.18
7/8	7/8	1-1/2	3-3/4	2	232780	153.18
15/16	5/8	1-1/2	3-5/8	2	232791	166.46
15/16	3/4	1-1/2	3-3/4	2	232802	176.38
1	3/4	1-1/2	3-3/4	2	232835	155.86
1	1	1-5/8	4-1/8	2	232857	177.47
1-1/8	1	1-5/8	4-1/8	2	232879	259.57
1-1/4	1	1-5/8	4-1/8	2	232901	289.36
1-1/2	1-1/4	1-5/8	4-1/8	2	232945	346.09



*All our tools are 100% Made in the USA*

FOR COATING INFORMATION SEE PAGE 5.

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



# M42 Cobalt Endmills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## SQUARE END - 30° HELIX - M42 COBALT



4 & 6 FLUTE - CENTER CUTTING - UNCOATED



4 & 6 FLUTE - CENTER CUTTING - ALTIN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	UNCOATED	LIST PRICE
1/8	3/8	3/8	2-5/16	4	230382	39.36
5/32	3/8	3/8	2-5/16	4	230393	53.93
3/16	3/8	1/2	2-3/8	4	230404	39.36
7/32	3/8	1/2	2-3/8	4	230415	53.93
1/4	3/8	5/8	2-7/16	4	230426	39.36
9/32	3/8	11/16	2-1/2	4	230437	53.93
5/16	3/8	3/4	2-1/2	4	230448	39.36
11/32	3/8	3/4	2-1/2	4	230459	55.07
3/8	3/8	3/4	2-1/2	4	230470	39.36
13/32	3/8	3/4	2-1/2	4	230481	80.47
7/16	3/8	1	2-11/16	4	230492	53.18
15/32	3/8	1	2-11/16	4	230503	94.36
1/2	3/8	1	2-11/16	4	230514	53.18
1/2	1/2	1-1/4	3-1/4	4	230525	53.18
17/32	1/2	1-1/4	3-1/4	4	230536	108.10
9/16	1/2	1-3/8	3-3/8	4	230547	69.19
5/8	1/2	1-3/8	3-3/8	4	230558	75.36
5/8	5/8	1-5/8	3-3/4	4	230569	83.68
11/16	1/2	1-5/8	3-5/8	4	230580	87.32
11/16	5/8	1-5/8	3-3/4	4	230591	88.98
3/4	1/2	1-5/8	3-5/8	4	230602	90.35
3/4	5/8	1-5/8	3-3/4	4	230613	90.35
3/4	3/4	1-5/8	3-7/8	4	230624	93.75
13/16	3/4	1-7/8	4-1/8	4	230635	119.57
7/8	3/4	1-7/8	4-1/8	4	230646	119.15
7/8	7/8	1-7/8	4-1/8	4	230657	119.15
15/16	3/4	1-7/8	4-1/8	4	230668	153.02
1	3/4	1-7/8	4-1/8	4	230679	135.61
1	1	2	4-1/2	4	230701	143.64
1-1/8	1	2	4-1/2	6	230712	204.91
1-1/4	1	2	4-1/2	6	230723	219.64
1-1/4	1-1/4	2	4-1/2	6	230734	223.88
1-3/8	1	2	4-1/2	6	230745	254.19
1-1/2	1	2	4-1/2	6	230756	274.37
1-1/2	1-1/4	2	4-1/2	4	230767	288.30
1-5/8	1-1/4	2	4-1/2	6	230778	314.03
2	1-1/4	2	4-1/2	6	230789	510.09

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	#OF FLTS	ALTIN	LIST PRICE
1/8	3/8	3/8	2-5/16	4	230800	49.20
5/32	3/8	3/8	2-5/16	4	230811	67.41
3/16	3/8	1/2	2-3/8	4	230822	49.20
7/32	3/8	1/2	2-3/8	4	230833	67.41
1/4	3/8	5/8	2-7/16	4	230844	49.20
9/32	3/8	11/16	2-1/2	4	230855	67.41
5/16	3/8	3/4	2-1/2	4	230866	49.20
11/32	3/8	3/4	2-1/2	4	230877	68.85
3/8	3/8	3/4	2-1/2	4	230888	49.20
13/32	3/8	3/4	2-1/2	4	230899	100.60
7/16	3/8	1	2-11/16	4	230910	66.50
15/32	3/8	1	2-11/16	4	230921	106.17
1/2	3/8	1	2-11/16	4	230932	66.50
1/2	1/2	1-1/4	3-1/4	4	230943	66.50
17/32	1/2	1-1/4	3-1/4	4	230954	135.12
9/16	1/2	1-3/8	3-3/8	4	230965	86.49
5/8	1/2	1-3/8	3-3/8	4	230976	94.17
5/8	5/8	1-5/8	3-3/4	4	230987	104.61
11/16	1/2	1-5/8	3-5/8	4	230998	109.16
11/16	5/8	1-5/8	3-3/4	4	231009	111.24
3/4	1/2	1-5/8	3-5/8	4	231020	112.94
3/4	5/8	1-5/8	3-3/4	4	231031	112.94
3/4	3/4	1-5/8	3-7/8	4	231042	112.94
13/16	3/4	1-7/8	4-1/8	4	231053	149.50
7/8	3/4	1-7/8	4-1/8	4	231064	148.97
7/8	7/8	1-7/8	4-1/8	4	231075	148.97
15/16	3/4	1-7/8	4-1/8	4	231086	191.29
1	3/4	1-7/8	4-1/8	4	231097	169.53
1	1	2	4-1/2	4	231119	179.52
1-1/8	1	2	4-1/2	6	231130	255.41
1-1/4	1	2	4-1/2	6	231141	274.56
1-1/4	1-1/4	2	4-1/2	6	231152	279.86
1-3/8	1	2	4-1/2	6	231163	309.34
1-1/2	1	2	4-1/2	6	231174	343.97
1-1/2	1-1/4	2	4-1/2	4	231185	360.51
1-5/8	1-1/4	2	4-1/2	6	231196	394.24
2	1-1/4	2	4-1/2	6	231207	632.57

FOR COATING INFORMATION SEE PAGE 5.

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

MADE IN USA

113

HSS ENDMILLS  
COBALT ENDMILLS



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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	2	231218	59.01
5/32	3/8	7/16	3-1/8	2	231229	62.64
3/16	3/8	7/16	3-1/8	2	231240	59.08
7/32	3/8	1/2	3-1/8	2	231251	62.68
1/4	3/8	1/2	3-1/8	2	231262	59.08
9/32	3/8	9/16	3-1/8	2	231273	62.68
5/16	3/8	9/16	3-1/8	2	231284	59.08
11/32	3/8	9/16	3-1/8	2	231295	62.68
3/8	3/8	9/16	3-1/8	2	231306	59.08
13/32	1/2	13/16	3-3/4	2	231317	95.49
7/16	1/2	13/16	3-3/4	2	231328	89.82
1/2	1/2	13/16	3-3/4	2	231350	89.82
9/16	5/8	1-1/8	4-1/2	2	231361	122.21
5/8	5/8	1-1/8	4-1/2	2	231372	122.21
3/4	3/4	1-5/16	5	2	231394	153.89
7/8	7/8	1-9/16	5-1/2	2	231416	193.64
1	1	1-5/8	5-7/8	2	231438	238.18

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	2	231449	73.77
5/32	3/8	7/16	3-1/8	2	231460	78.31
3/16	3/8	7/16	3-1/8	2	231471	73.81
7/32	3/8	1/2	3-1/8	2	231482	78.35
1/4	3/8	1/2	3-1/8	2	231493	73.81
9/32	3/8	9/16	3-1/8	2	231504	78.35
5/16	3/8	9/16	3-1/8	2	231515	73.81
11/32	3/8	9/16	3-1/8	2	231526	78.35
3/8	3/8	9/16	3-1/8	2	231537	73.81
13/32	1/2	13/16	3-3/4	2	231548	51.25
7/16	1/2	13/16	3-3/4	2	231559	112.26
1/2	1/2	13/16	3-3/4	2	231581	112.26
9/16	5/8	1-1/8	4-1/2	2	231592	152.76
5/8	5/8	1-1/8	4-1/2	2	231603	152.76
3/4	3/4	1-5/16	5	2	231625	192.42
7/8	7/8	1-9/16	5-1/2	2	231647	242.04
1	1	1-5/8	5-7/8	2	231669	297.72

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



**UNCOATED**



**ALTiN COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	4	231680	59.61
5/32	3/8	7/16	3-1/8	4	231691	62.94
3/16	3/8	1/2	3-1/8	4	231702	59.61
7/32	3/8	9/16	3-1/4	4	231713	62.94
1/4	3/8	5/8	3-3/8	4	231724	59.61
9/32	3/8	11/16	3-3/8	4	231735	62.94
5/16	3/8	3/4	3-1/2	4	231746	59.61
11/32	3/8	3/4	3-1/2	4	231757	62.94
3/8	3/8	3/4	3-1/2	4	231768	59.61
13/32	1/2	1	4-1/8	4	231779	92.54
7/16	1/2	1	4-1/8	4	231790	90.01
1/2	1/2	1	4-1/8	4	231812	90.01
9/16	5/8	1-3/8	5	4	231823	120.13
5/8	5/8	1-3/8	5	4	231834	120.13
3/4	3/4	1-5/8	5-5/8	4	231856	151.32
7/8	7/8	1-7/8	6-1/8	4	231878	202.04
1	1	1-7/8	6-3/8	4	231900	234.59

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/8	3/8	3/8	3-1/16	4	231911	74.52
5/32	3/8	7/16	3-1/8	4	231922	78.69
3/16	3/8	1/2	3-1/8	4	231933	74.52
7/32	3/8	9/16	3-1/4	4	231944	78.69
1/4	3/8	5/8	3-3/8	4	231955	74.52
9/32	3/8	11/16	3-3/8	4	231966	78.69
5/16	3/8	3/4	3-1/2	4	231977	74.52
11/32	3/8	3/4	3-1/2	4	231988	78.69
3/8	3/8	3/4	3-1/2	4	231999	74.52
13/32	1/2	1	4-1/8	4	232010	115.67
7/16	1/2	1	4-1/8	4	232021	112.53
1/2	1/2	1	4-1/8	4	232043	112.53
9/16	5/8	1-3/8	5	4	232054	150.19
5/8	5/8	1-3/8	5	4	232065	150.19
3/4	3/4	1-5/8	5-5/8	4	232087	189.17
7/8	7/8	1-7/8	6-1/8	4	232109	252.57
1	1	1-7/8	6-3/8	4	232131	293.07

FOR COATING INFORMATION SEE PAGE 5.

TOLERANCES	DIAMETER		SHANK
	IF SIZE & SHANK DIA. ARE NOT THE SAME	IF SIZE & SHANK DIA. ARE THE SAME	
ALL SIZES	+0.000, -.0015	+0.000, -.0025	+0.001, -.0005

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## COARSE PITCH - 30° HELIX - NON CENTER CUTTING - M42 COBALT



UNCOATED



ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	167220	72.67
5/16	3/8	3/4	2-1/2	3	167231	79.29
3/8	3/8	3/4	2-1/2	4	167242	82.85
7/16	3/8	1	2-11/16	4	167253	83.80
1/2	1/2	1	3	4	167264	84.86
1/2	1/2	1-1/4	3-1/4	4	167275	87.77
5/8	5/8	1-5/8	3-3/4	4	167286	111.69
3/4	3/4	1-5/8	3-7/8	4	167297	122.93
7/8	3/4	1-7/8	4-1/8	5	167308	157.38
1	1	2	4-1/2	5	167319	164.68
1-1/8	1	2	4-1/2	6	167330	255.82
1-1/4	1-1/4	2	4-1/2	6	167341	277.59
1-1/2	1-1/4	2	4-1/2	6	167352	325.46
2	1-1/4	2	4-1/2	8	167374	452.26

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	167385	90.80
5/16	3/8	3/4	2-1/2	3	167396	99.16
3/8	3/8	3/4	2-1/2	4	167407	103.59
7/16	3/8	1	2-11/16	4	167418	104.20
1/2	1/2	1	3	4	167429	106.09
1/2	1/2	1-1/4	3-1/4	4	167440	109.72
5/8	5/8	1-5/8	3-3/4	4	167451	139.63
3/4	3/4	1-5/8	3-7/8	4	167462	153.67
7/8	3/4	1-7/8	4-1/8	5	167473	212.94
1	1	2	4-1/2	5	167484	205.82
1-1/8	1	2	4-1/2	6	167495	319.64
1-1/4	1-1/4	2	4-1/2	6	167506	346.89
1-1/2	1-1/4	2	4-1/2	6	167517	406.84
2	1-1/4	2	4-1/2	8	167539	565.31

## FINE PITCH - 30° HELIX - NON CENTER CUTTING - M42 COBALT



UNCOATED



ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	168364	72.67
5/16	3/8	3/4	2-1/2	3	168375	79.33
3/8	3/8	3/4	2-1/2	4	168386	83.38
7/16	3/8	1	2-11/16	4	168397	83.80
1/2	1/2	1-1/4	3-1/4	4	168408	87.77
5/8	5/8	1-5/8	3-3/4	4	168419	111.69
3/4	3/4	1-5/8	3-7/8	4	168430	122.93
7/8	3/4	1-7/8	4-1/8	5	168441	160.82
1	1	2	4-1/2	5	168452	164.76
1-1/8	1	2	4-1/2	6	168463	273.19
1-1/4	1-1/4	2	4-1/2	6	168474	277.59
1-1/2	1-1/4	2	4-1/2	6	168485	342.91
2	1-1/4	2	4-1/2	8	168507	482.92

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLTS	ITEM#	LIST PRICE
1/4	3/8	5/8	2-7/16	3	168518	90.80
5/16	3/8	3/4	2-1/2	3	168529	99.16
3/8	3/8	3/4	2-1/2	4	168540	104.20
7/16	3/8	1	2-11/16	4	168551	104.73
1/2	1/2	1-1/4	3-1/4	4	168562	106.09
5/8	5/8	1-5/8	3-3/4	4	168573	139.63
3/4	3/4	1-5/8	3-7/8	4	168584	153.67
7/8	3/4	1-7/8	4-1/8	5	168595	201.02
1	1	2	4-1/2	5	168606	205.97
1-1/8	1	2	4-1/2	6	168617	341.47
1-1/4	1-1/4	2	4-1/2	6	168628	346.89
1-1/2	1-1/4	2	4-1/2	6	168639	428.64
2	1-1/4	2	4-1/2	8	168661	604.22

FOR COATING INFORMATION SEE PAGE 5.

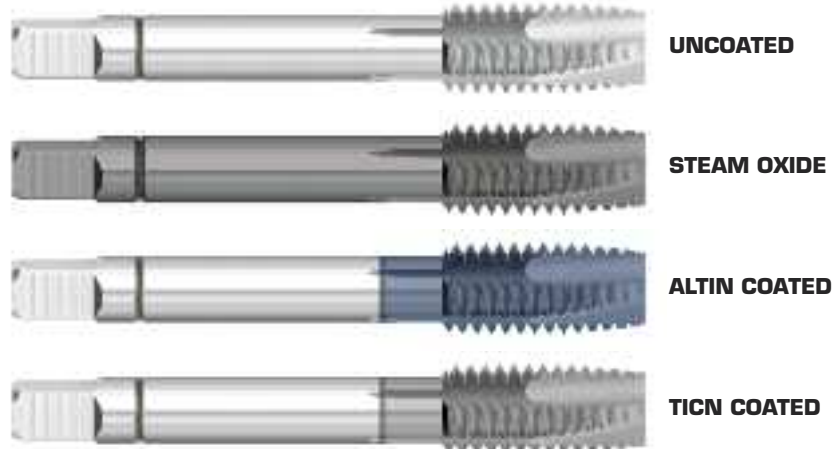
TOLERANCES	DIAMETER	SHANK
ALL SIZES	+.005, -.005	+.0000, -.0005

# Spiral Point Taps

**HIGH PERFORMANCE**

## Predator

**PREMIUM POWDERED METAL**



HP TAPS

TAPS

DIES

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
2 - 56	H2	3	1	263555	26.10	263544	30.03	263566	40.16	263830	40.16
4 - 40	H2	3	1	213002	26.10	212793	30.03	213211	40.16	263841	40.16
6 - 32	H3	3	1	213013	26.10	212804	30.03	213222	40.16	263852	40.16
8 - 32	H3	3	1	213024	26.10	212815	30.03	213233	40.16	263863	40.16
10 - 24	H3	3	1	213035	26.10	212826	30.03	213244	40.16	263874	40.16
10 - 32	H3	3	1	213046	26.10	212837	30.03	213255	40.16	263885	40.16
1/4 - 20	H5	3	1	213057	28.52	212848	32.81	213266	43.88	263896	43.88
1/4 - 28	H4	3	1	213068	28.52	212859	32.81	213277	43.88	263907	43.88
5/16 - 18	H5	3	1	213079	31.18	212870	35.87	213288	47.99	263918	47.99
5/16 - 24	H4	3	1	213090	31.18	212881	35.87	213299	47.99	263929	47.99
3/8 - 16	H5	3	1	213101	37.10	212892	42.65	213310	57.07	263940	57.07
3/8 - 24	H4	3	1	213112	37.10	212903	42.65	213321	57.07	263951	57.07
7/16 - 14	H5	3	1	213123	47.51	212914	54.62	213332	73.08	263962	73.08
7/16 - 20	H5	3	1	213134	47.51	212925	54.62	213343	73.08	263973	73.08
1/2 - 13	H5	4	1	213145	56.71	212936	65.21	213354	87.24	263984	87.24
1/2 - 20	H5	4	1	213156	56.71	212947	65.21	213365	87.24	263995	87.24
5/8 - 11	H6	4	1	213167	108.04	212958	124.26	213376	166.23	264006	166.23
5/8 - 18	H5	4	1	213178	108.04	212969	124.26	213387	166.23	264017	166.23
3/4 - 10	H6	4	1	213189	139.69	212980	160.64	213398	214.90	264028	214.90
3/4 - 16	H5	4	1	213200	139.69	212991	160.64	213409	214.90	264039	214.90

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

FOR COATING INFORMATION SEE PAGE 5.

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 203-204

# Spiral Point Taps

HIGH PERFORMANCE

## Predator

PREMIUM POWDERED METAL METRIC



SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
M2.5 x .45	D3	2	1	264050	29.62	264072	34.08	264094	44.41	264303	44.41
M3 x 0.5	D3	2	1	214311	29.62	214388	34.08	214465	44.41	264314	44.41
M3.5 x 0.6	D4	3	1	264061	29.62	264083	34.08	264105	44.41	264325	44.41
M4 x 0.7	D4	3	1	214322	29.62	214399	34.08	214476	44.41	264336	44.41
M5 x 0.8	D4	3	1	214333	29.62	214410	34.08	214487	44.41	264347	44.41
M6 x 1.0	D5	3	1	214344	32.55	214421	37.42	214498	48.81	264358	48.81
M8 x 1.25	D5	3	1	214355	35.41	214432	40.73	214509	53.17	264369	53.17
M10 x 1.5	D6	3	1	214366	42.06	214443	48.33	214520	62.57	264380	62.57
M12 x 1.75	D6	4	1	214377	64.45	214454	74.10	214531	96.36	264391	96.36
M14 x 2.0	D7	4	1	233858	98.26	233880	112.99	233902	132.55	264402	132.55
M16 x 2.0	D7	4	1	233869	115.41	233891	132.72	233913	155.73	264413	155.73

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

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 203-204

# Spiral Flute Taps

**HIGH PERFORMANCE**

## Predator

**HIGH VANADIUM POWDERED METAL**

**45° HELIX - SEMI BOTTOMING ■ 2 - 2-1/2 THREAD CHAMFER**



HP TAPS

TAPS

DIES

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED LIST PRICE	STM OXIDE LIST PRICE	ALTIN LIST PRICE	TICN LIST PRICE
2 - 56	H2	3	1	263577 40.38	263599 46.43	263588 62.08	263610 62.08
4 - 40	H2	3	1	213420 40.38	213838 46.43	213629 62.08	263621 62.08
6 - 32	H3	3	1	213431 40.38	213849 46.43	213640 62.08	263632 62.08
8 - 32	H3	3	1	213442 40.38	213860 46.43	213651 62.08	263643 62.08
10 - 24	H3	3	1	213453 40.38	213871 46.43	213662 62.08	263654 62.08
10 - 32	H3	3	1	213464 40.38	213882 46.43	213673 62.08	263665 62.08
1/4 - 20	H5	3	1	213475 41.60	213893 47.84	213684 63.99	263676 63.99
1/4 - 28	H4	3	1	213486 41.60	213904 47.84	213695 63.99	263687 63.99
5/16 - 18	H5	3	1	213497 45.57	213915 52.38	213706 70.08	263698 70.08
5/16 - 24	H4	3	1	213508 45.57	213926 52.38	213717 70.08	263709 70.08
3/8 - 16	H5	3	1	213519 53.97	213937 62.08	213728 83.06	263720 83.06
3/8 - 24	H4	3	1	213530 53.97	213948 62.08	213739 83.06	263731 83.06
7/16 - 14	H5	3	1	213541 68.28	213959 78.55	213750 105.05	263742 105.05
7/16 - 20	H5	3	1	213552 68.28	213970 78.55	213761 105.05	263753 105.05
1/2 - 13	H5	4	1	213563 80.97	213981 93.15	213772 124.59	263764 124.59
1/2 - 20	H5	4	1	213574 80.97	213992 93.15	213783 124.59	263775 124.59
5/8 - 11	H6	4	1	213585 154.69	214003 177.91	213794 238.00	263786 238.00
5/8 - 18	H5	4	1	213596 154.69	214014 177.91	213805 238.00	263797 238.00
3/4 - 10	H6	4	1	213607 180.79	214025 207.94	213816 278.20	263808 278.20
3/4 - 16	H5	4	1	213618 180.79	214036 207.94	213827 278.20	263819 278.20

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

FOR COATING INFORMATION SEE PAGE 5.

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 203-204



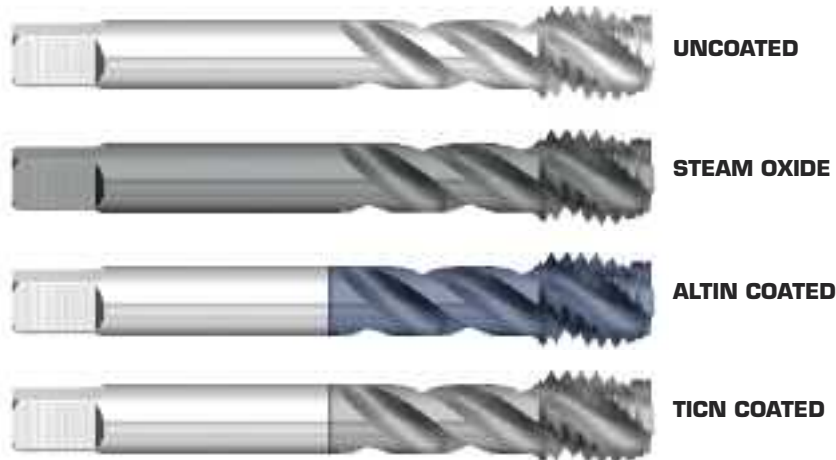
# Spiral Flute Taps

HIGH PERFORMANCE

## Predator

HIGH VANADIUM POWDERED METAL  
METRIC

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



SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STM OXIDE	LIST PRICE	ALTIM	LIST PRICE	TICN	LIST PRICE
M2.5 x .45	D3	2	1	264116	45.80	264138	52.66	264160	67.59	264182	67.59
M3 x 0.5	D3	2	1	214542	45.81	214619	52.66	214696	67.59	264193	67.59
M3.5 x 0.6	D4	3	1	264127	45.80	264149	52.66	264171	67.59	264204	67.59
M4 x 0.7	D4	3	1	214553	45.81	214630	52.66	214707	67.59	264215	67.59
M5 x 0.8	D4	3	1	214564	45.81	214641	52.66	214718	67.59	264226	67.59
M6 x 1.0	D5	3	1	214575	47.17	214652	54.26	214729	70.08	264237	70.08
M8 x 1.25	D5	3	1	214586	51.81	214663	59.58	214740	77.57	264248	77.57
M10 x 1.5	D6	3	1	214597	61.25	214674	70.45	214751	91.34	264259	91.34
M12 x 1.75	D6	4	1	214608	91.92	214685	105.69	214762	137.66	264270	137.66
M14 x 2.0	D7	4	1	233924	130.27	233946	149.83	233968	175.87	264281	175.87
M16 x 2.0	D7	4	1	233935	152.42	233957	175.29	233979	205.76	264292	205.76

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

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 203-204



**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	17.04	199549	51.09
0 - 80	H2	2	1	-	199560	199571	17.04	-	-
1 - 64	H1	2	1	-	199604	199626	15.85	199648	47.51
1 - 72	H1	2	1	199670	199681	199692	15.85	199703	47.51
1 - 72	H2	2	1	-	199714	199725	15.85	-	-
2 - 56	H1	3	1	199736	199747	199758	14.66	199769	43.93
2 - 56	H2	2	1	-	199780	199791	14.66	-	-
2 - 56	H2	3	1	199802	199824	199846	13.63	199868	40.90
2 - 64	H2	3	1	199879	199901	199923	14.66	199945	43.93
3 - 48	H2	2	1	-	199967	-	11.93	-	-
3 - 48	H2	3	1	199989	200011	200033	10.50	200055	31.46
3 - 56	H2	3	1	200066	200077	200088	11.79	200099	35.34
4 - 40	H1	2	1	-	200110	-	9.65	-	-
4 - 40	H1	3	1	200121	200132	200143	9.27	200154	27.74
4 - 40	H2	2	1	-	200165	200176	9.27	-	-
4 - 40	H2	3	1	200187	200209	200242	8.62	200275	25.84
4 - 48	H2	3	1	200297	200319	200352	9.27	200385	27.74
4 - 36	H2	3	1	-	200418	-	9.27	-	-
5 - 40	H1	3	1	-	200495	200506	9.27	-	-
5 - 40	H2	2	1	-	200517	200528	9.27	-	-
5 - 40	H2	3	1	200539	200561	200594	8.62	200627	25.84
5 - 44	H2	3	1	200649	200671	200704	9.27	200737	27.85
6 - 32	H1	3	1	200759	200770	200781	8.15	200792	24.40
6 - 32	H2	2	1	-	200803	200814	8.15	-	-
6 - 32	H2	3	1	200825	200847	200880	6.99	200913	21.03
6 - 32	H3	2	1	-	200924	200935	6.99	-	-
6 - 32	H3	3	1	200946	200957	200968	6.61	200979	19.80
6 - 32	H7	3	1	-	200990	201001	8.15	-	-
6 - 40	H2	2	1	-	201023	-	8.15	-	-
6 - 40	H2	3	1	201034	201056	201089	6.99	201122	21.03
8 - 32	H1	3	1	-	201144	201155	8.15	-	-
8 - 32	H1	4	1	201166	201177	201188	8.15	201199	24.40
8 - 32	H2	2	1	-	201210	201221	8.15	-	-
8 - 32	H2	3	1	-	201232	201243	8.15	-	-
8 - 32	H2	4	1	201254	201265	201276	6.99	201287	21.03
8 - 32	H3	2	1	-	201298	201309	6.99	-	-
8 - 32	H3	3	1	-	201320	201331	6.99	-	-
8 - 32	H3	4	1	201342	201364	201397	6.75	201430	20.28

CONTINUED ON NEXT PAGE

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Hand Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



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	8.15	-	-
8 - 36	H1	4	1	-	201485	-	8.15	-	-
8 - 36	H2	4	1	201496	201518	201551	6.99	201584	21.03
10 - 24	H1	3	1	-	201595	-	8.15	-	-
10 - 24	H1	4	1	201606	201617	201628	7.23	201639	21.64
10 - 24	H2	2	1	-	201650	201661	8.15	-	-
10 - 24	H2	3	1	-	201672	-	8.15	-	-
10 - 24	H2	4	1	201683	201694	201705	7.23	201716	21.64
10 - 24	H3	2	1	-	201727	201738	7.23	-	-
10 - 24	H3	3	1	-	201749	201760	7.23	-	-
10 - 24	H3	4	1	201771	201793	201826	6.99	201859	21.03
10 - 24	H7	3	1	-	201870	201881	8.15	-	-
10 - 24	H7	4	1	-	201892	201903	8.15	-	-
10 - 32	H1	2	1	-	201914	201925	8.15	-	-
10 - 32	H1	3	1	-	201936	-	8.15	-	-
10 - 32	H1	4	1	201947	201958	201969	7.23	201980	21.64
10 - 32	H2	2	1	-	201991	202002	8.15	-	-
10 - 32	H2	3	1	-	202013	202024	8.15	-	-
10 - 32	H2	4	1	202035	202046	202057	7.23	202068	21.64
10 - 32	H3	2	1	-	202079	202090	7.23	-	-
10 - 32	H3	3	1	-	202101	202112	7.23	-	-
10 - 32	H3	4	1	202123	202145	202178	6.99	202211	21.03
12 - 24	H3	4	1	202266	202288	202321	7.40	202354	22.19
12 - 28	H3	4	1	202376	202398	202431	8.15	202464	24.40
1/4 - 20	H1	3	1	-	202475	-	9.41	-	-
1/4 - 20	H1	4	1	202486	202497	202508	9.41	202519	28.22
1/4 - 20	H2	3	1	-	202530	-	9.41	-	-
1/4 - 20	H2	4	1	202541	202552	202563	8.96	202574	26.89
1/4 - 20	H3	2	1	-	202585	202596	9.41	-	-
1/4 - 20	H3	3	1	-	202607	202618	8.96	-	-
1/4 - 20	H3	4	1	202629	202651	202684	7.53	202717	22.60
1/4 - 20	H5	3	1	-	202728	202739	9.41	-	-
1/4 - 20	H5	4	1	-	202750	202761	8.96	-	-
1/4 - 28	H1	4	1	-	202772	202783	8.96	-	-
1/4 - 28	H2	4	1	-	202794	202805	9.41	-	-
1/4 - 28	H3	2	1	-	202816	202827	9.41	-	-
1/4 - 28	H3	3	1	-	202838	202849	9.41	-	-
1/4 - 28	H3	4	1	202860	202882	202915	7.53	202948	22.60
1/4 - 28	H4	4	1	-	202959	202970	9.41	-	-
5/16 - 18	H1	4	1	202981	202992	203003	10.43	-	-
5/16 - 18	H2	4	1	203014	203025	203036	10.43	203047	31.29

CONTINUED ON NEXT PAGE

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA



**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	11.72	-	-
5/16 - 18	H3	3	1	-	203080	203091	10.43	-	-
5/16 - 18	H3	4	1	203102	203124	203157	9.27	203190	27.81
5/16 - 18	H5	3	1	-	203201	203212	11.72	-	-
5/16 - 18	H5	4	1	-	203223	203234	10.43	-	-
5/16 - 24	H1	4	1	-	203256	203267	10.43	-	-
5/16 - 24	H2	4	1	-	203278	-	10.43	-	-
5/16 - 24	H3	3	1	-	203300	203311	10.43	-	-
5/16 - 24	H3	4	1	203322	203344	203377	9.27	203410	27.81
5/16 - 24	H4	4	1	-	203421	203432	10.43	-	-
3/8 - 16	H1	3	1	-	203443	-	13.36	-	-
3/8 - 16	H2	4	1	203476	203487	203498	11.72	203509	35.21
3/8 - 16	H3	3	1	-	203520	203531	11.72	-	-
3/8 - 16	H3	4	1	203542	203564	203597	10.46	203630	31.39
3/8 - 16	H5	3	1	-	203641	203652	13.36	-	-
3/8 - 16	H5	4	1	-	203663	203674	11.72	-	-
3/8 - 24	H3	3	1	-	203740	203751	13.36	-	-
3/8 - 24	H3	4	1	203762	203784	203817	10.46	203850	31.39
3/8 - 24	H4	4	1	-	203861	203872	11.72	-	-
7/16 - 14	H2	4	1	-	203905	203916	19.77	-	-
7/16 - 14	H3	3	1	-	203927	-	19.77	-	-
7/16 - 14	H3	4	1	203938	203960	203993	18.00	204026	53.95
7/16 - 14	H5	4	1	-	204037	204048	19.77	-	-
7/16 - 20	H2	4	1	-	204081	204092	19.77	-	-
7/16 - 20	H3	3	1	-	204103	-	19.77	-	-
7/16 - 20	H3	4	1	204114	204136	204169	18.00	204202	53.95
7/16 - 20	H5	4	1	-	204213	204224	19.77	-	-
1/2 - 13	H1	4	1	-	204235	204246	23.07	-	-
1/2 - 13	H2	4	1	-	204257	204268	23.07	-	-
1/2 - 13	H3	3	1	-	204279	204290	23.07	-	-
1/2 - 13	H3	4	1	204301	204323	204356	18.75	204389	56.27
1/2 - 13	H5	4	1	-	204400	204411	23.42	-	-
1/2 - 20	H1	4	1	204422	204433	204444	23.07	-	-
1/2 - 20	H3	3	1	-	204477	-	23.07	-	-
1/2 - 20	H3	4	1	204488	204510	204543	21.20	204576	63.60
1/2 - 20	H5	4	1	-	204587	204598	23.07	-	-
9/16 - 12	H2	4	1	-	204609	-	34.29	-	-
9/16 - 12	H3	4	1	204620	204642	204675	31.46	204708	94.41
9/16 - 12	H5	4	1	-	204719	204730	34.29	-	-

CONTINUED ON NEXT PAGE

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Hand Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



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	-	34.29	-	-
9/16 - 18	H3	4	1	204752	204774	204807	31.46	204840	94.41
9/16 - 18	H5	4	1	-	204851	204862	34.29	-	-
5/8 - 11	H3	4	1	204895	204917	204950	37.76	204983	113.26
5/8 - 11	H5	4	1	-	204994	205005	43.42	-	-
5/8 - 18	H2	4	1	-	205027	205038	43.42	-	-
5/8 - 18	H3	4	1	205049	205071	205104	37.76	205137	113.26
11/16 - 11	H3	4	1	205170	205192	205225	46.90	205258	140.70
11/16 - 16	H3	4	1	205269	205291	205324	46.90	205357	140.70
3/4 - 10	H2	4	1	-	205379	-	57.09	-	-
3/4 - 10	H3	4	1	205390	205412	205445	52.86	205478	158.49
3/4 - 10	H5	4	1	-	205489	205500	57.09	-	-
3/4 - 16	H2	4	1	-	205522	-	57.09	-	-
3/4 - 16	H3	4	1	205533	205555	205588	52.86	205621	158.49
3/4 - 16	H5	4	1	-	205632	205643	57.09	-	-
7/8 - 9	H4	4	1	205665	205687	205720	73.65	205753	220.96
7/8 - 9	H6	4	1	-	205764	-	77.34	-	-
7/8 - 14	H2	4	1	-	205775	-	77.34	-	-
7/8 - 14	H4	4	1	205786	205808	205841	73.65	205874	220.96
7/8 - 14	H6	4	1	-	205885	-	77.34	-	-
1 - 8	H2	4	1	-	205896	-	100.85	-	-
1 - 8	H4	4	1	205907	205929	205962	97.92	205995	293.80
1 - 8	H6	4	1	-	206006	-	100.85	-	-
1 - 12	H4	4	1	206017	206039	206072	97.92	206105	293.80
1 - 14	H2	4	1	-	206116	-	100.85	-	-
1 - 14	H4	4	1	206127	206149	206182	97.92	206215	293.80
1 - 14	H6	4	1	206226	206237	206248	100.85	-	-
1-1/8 - 7	H4	4	1	206259	206281	206314	158.49	206347	475.47
1-1/8 - 12	H4	4	1	206358	206380	206413	167.86	206446	503.59
1-1/4 - 7	H4	4	1	206457	206479	206512	208.05	206545	624.07
1-1/4 - 12	H4	6	1	206556	206578	206611	211.66	206644	634.98
1-3/8 - 6	H4	4	1	206655	206677	206710	261.39	206743	784.13
1-3/8 - 12	H4	6	1	206754	206776	206809	263.23	206842	789.65
1-1/2 - 6	H4	4	1	206853	206875	206908	301.84	206941	905.53
1-1/2 - 12	H4	6	1	206952	206974	207007	307.40	207040	922.17

HP TAPS

TAPS

DIES

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA



## 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	19.60
2 - 56	H2	3	1	199813	199835	199857	15.71
3 - 48	H2	3	1	200000	200022	200044	12.10
4 - 40	H2	3	1	200198	200231	200264	9.92
4 - 48	H2	3	1	200308	200341	200374	10.67
5 - 40	H2	3	1	200550	200583	200616	9.92
6 - 32	H2	3	1	200836	200869	200902	8.08
6 - 40	H2	3	1	201045	201078	201111	8.08
8 - 32	H3	4	1	201353	201386	201419	7.81
8 - 36	H2	4	1	201507	201540	201573	8.08
10 - 24	H3	4	1	201782	201815	201848	8.08
10 - 32	H3	4	1	202134	202167	202200	8.08
12 - 24	H3	4	1	202277	202310	202343	8.52
12 - 28	H3	4	1	202387	202420	202453	9.37
1/4 - 20	H3	4	1	202640	202673	202706	8.66
1/4 - 28	H3	4	1	202871	202904	202937	8.66
5/16 - 18	H3	4	1	203113	203146	203179	10.67
5/16 - 24	H3	4	1	203333	203366	203399	10.67
3/8 - 16	H3	4	1	203553	203586	203619	12.03
3/8 - 24	H3	4	1	203773	203806	203839	12.03
7/16 - 14	H3	4	1	203949	203982	204015	20.72
7/16 - 20	H3	4	1	204125	204158	204191	20.72
1/2 - 13	H3	4	1	204312	204345	204378	21.57
1/2 - 20	H3	4	1	204499	204532	204565	24.40
9/16 - 12	H3	4	1	204631	204664	204697	36.16
9/16 - 18	H3	4	1	204763	204796	204829	36.16
5/8 - 11	H3	4	1	204906	204939	204972	43.42
5/8 - 18	H3	4	1	205060	205093	205126	43.42
3/4 - 10	H3	4	1	205401	205434	205467	60.77
3/4 - 16	H3	4	1	205544	205577	205610	60.77
7/8 - 9	H4	4	1	205676	205709	205742	84.73
7/8 - 14	H4	4	1	205797	205830	205863	84.73
1 - 8	H4	4	1	205918	205951	205984	112.54
1 - 12	H4	4	1	206028	206061	206094	112.54
1 - 14	H4	4	1	206138	206171	206204	112.54
1-1/8 - 7	H4	4	1	206270	206303	206336	182.25
1-1/8 - 12	H4	4	1	206369	206402	206435	193.05
1-1/4 - 7	H4	4	1	206468	206501	206534	239.23
1-1/4 - 12	H4	6	1	206567	206600	206633	243.39
1-3/8 - 6	H4	4	1	206666	206699	206732	300.58
1-3/8 - 12	H4	6	1	206765	206798	206831	302.70
1-1/2 - 6	H4	4	1	206864	206897	206930	347.11
1-1/2 - 12	H4	6	1	206963	206996	207029	353.52

**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 TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Hand Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	9.92
6 - 32	H2	3	1	200858	200891	8.08
6 - 40	H2	3	1	201067	201100	8.08
8 - 32	H3	4	1	201375	201408	7.81
10 - 24	H3	4	1	201804	201837	8.08
10 - 32	H3	4	1	202156	202189	8.08
1/4 - 20	H3	4	1	202662	202695	8.66
1/4 - 28	H3	4	1	202893	202926	8.66
5/16 - 18	H3	4	1	203135	203168	10.67
3/8 - 16	H3	4	1	203575	203608	12.03
3/8 - 24	H3	4	1	203795	203828	12.03
7/16 - 14	H3	4	1	203971	204004	20.72
7/16 - 20	H3	4	1	204147	204180	20.72
1/2 - 13	H3	4	1	204334	204367	21.57
1/2 - 20	H3	4	1	204521	204554	24.40
9/16 - 12	H3	4	1	204653	204686	36.16
9/16 - 18	H3	4	1	204785	204818	36.16
5/8 - 11	H3	4	1	204928	204961	43.42
5/8 - 18	H3	4	1	205082	205115	43.42
3/4 - 10	H3	4	1	205423	205456	60.77
3/4 - 16	H3	4	1	205566	205599	60.77
7/8 - 9	H3	4	1	205698	205731	84.73
7/8 - 14	H4	4	1	205819	205852	84.73
1 - 8	H4	4	1	205940	205973	112.54
1-1/8 - 7	H4	4	1	206292	206325	182.25
1-1/4 - 7	H4	4	1	206490	206523	239.23
1-1/4 - 12	H4	6	1	206589	206622	243.39
1-1/2 - 6	H4	4	1	206886	206919	347.11
1-1/2 - 12	H4	6	1	206985	207018	353.52

**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 TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

125

HP TAPS

TAPS

DIES



**HIGH SPEED STEEL  
TIN COATED**

HP TAPS

TAPS

DIES

SIZE	H-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	30.67	240527	92.06
2 - 56	H2	3	1	240538	240549	240560	24.57	240571	73.67
4 - 40	H2	3	1	240582	240593	240604	15.50	240615	46.53
5 - 40	H2	3	1	240626	240637	240648	15.50	240659	46.53
6 - 32	H3	3	1	240670	240681	240692	11.89	240703	35.66
8 - 32	H3	4	1	240714	240725	240736	12.18	240747	36.56
10 - 24	H3	4	1	240758	240769	240780	12.61	240791	37.90
10 - 32	H3	4	1	240802	240813	240824	12.61	240835	37.90
12 - 24	H3	4	1	240846	240857	240868	13.33	240879	39.96
12 - 28	H3	4	1	240890	240901	240912	14.67	240923	44.00
1/4 - 20	H3	4	1	240934	240945	240956	13.55	240967	40.72
1/4 - 28	H3	4	1	240978	240989	241000	13.55	241011	40.72
5/16 - 18	H3	4	1	241022	241033	241044	16.73	241055	50.15
5/16 - 24	H3	4	1	241066	241077	241088	16.73	241099	50.15
3/8 - 16	H3	4	1	241110	241121	241132	18.86	241143	56.54
3/8 - 24	H3	4	1	241154	241165	241176	18.86	241187	56.54
7/16 - 14	H3	4	1	241198	241209	241220	32.41	241231	97.26
7/16 - 20	H3	4	1	241242	241253	241264	32.41	241275	97.26
1/2 - 13	H3	4	1	241286	241297	241308	33.78	241319	101.38
1/2 - 20	H3	4	1	241330	241341	241352	38.19	241363	114.60
9/16 - 18	H3	4	1	254709	254720	254731	51.88	254742	155.82
5/8 - 11	H3	4	1	241374	241385	241396	68.07	241407	204.05
5/8 - 18	H3	4	1	241418	241429	241440	68.07	241451	204.05
3/4 - 10	H3	4	1	241462	241473	241484	95.24	241495	285.60
3/4 - 16	H3	4	1	241506	241517	241528	95.24	241539	285.60
1 - 8	H4	4	1	254753	254764	254775	161.60	254786	484.92

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Hand Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



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	-	22.77	-	-
M2 x 0.4	D3	3	1	210802	210813	210824	22.77	211594	68.27
M2.5 x 0.45	D3	3	1	-	210835	-	14.01	-	-
M3 x 0.5	D3	3	1	210846	210857	210868	11.66	211605	35.00
M3.5 x 0.6	D4	3	1	-	210879	-	9.65	-	-
M4 x 0.7	D4	4	1	210890	210901	210912	9.65	211616	28.94
M4.5 x 0.75	D4	4	1	-	210923	-	9.65	-	-
M5 x 0.8	D4	4	1	210934	210945	210956	9.65	211627	28.94
M6 x 1.0	D5	4	1	210967	210978	210989	10.19	211638	30.54
M7 x 1.0	D5	4	1	211000	211011	211022	10.19	211649	30.57
M8 x 1.25	D5	4	1	211033	211044	211055	10.19	211660	30.57
M10 x 1.25	D5	4	1	211066	211077	211088	20.93	211671	62.75
M10 x 1.50	D6	4	1	211099	211110	211121	20.93	211682	62.75
M12 x 1.25	D5	4	1	211132	211143	211154	24.54	211693	73.59
M12 x 1.75	D6	4	1	211165	211176	211187	24.54	211704	73.59
M14 x 1.5	D6	4	1	211198	211209	211220	36.67	211715	110.02
M14 x 2.0	D7	4	1	211231	211242	211253	36.67	211726	110.02
M16 x 1.5	D6	4	1	211264	211275	211286	44.68	211737	134.05
M16 x 2.0	D7	4	1	211297	211308	211319	44.68	211748	134.05
M18 x 1.5	D6	4	1	211330	211341	211352	60.19	211759	180.54
M18 x 2.5	D7	4	1	211363	211374	211385	60.19	211770	180.54
M20 x 2.5	D7	4	1	211396	211407	211418	77.85	211781	233.51
M24 x 3.0	D8	4	1	211429	211440	211451	113.91	211792	341.69
M27 x 3.0	D8	4	1	211462	211473	211484	196.87	211803	590.60
M30 x 3.5	D9	4	1	211495	211506	211517	251.44	211814	754.24
M33 x 3.5	D9	4	1	211528	211539	211550	250.75	211825	752.26
M36 x 4.0	D9	4	1	211561	211572	211583	318.00	211836	954.04

HP TAPS

TAPS

DIES

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

127



**HIGH SPEED STEEL  
METRIC  
TIN COATED**

HP TAPS

TAPS

DIES

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	-	41.01	-	-
M2 x 0.4	D3	3	1	243497	243508	243519	41.01	244289	123.02
M2.5 x 0.45	D3	3	1	-	243530	-	25.22	-	-
M3 x 0.5	D3	3	1	243541	243552	243563	21.03	244300	63.12
M3.5 x 0.6	D4	3	1	-	243574	-	17.38	-	-
M4 x 0.7	D4	4	1	243585	243596	243607	17.38	244311	52.13
M4.5 x 0.75	D4	4	1	-	243618	-	17.38	-	-
M5 x 0.8	D4	4	1	243629	243640	243651	17.38	244322	52.13
M6 x 1.0	D5	4	1	243662	243673	243684	18.35	244333	55.02
M7 x 1.0	D5	4	1	243695	243706	243717	18.39	244344	55.06
M8 x 1.25	D5	4	1	243728	243739	243750	18.39	244355	55.06
M10 x 1.25	D5	4	1	243761	243772	243783	37.68	244366	113.08
M10 x 1.50	D6	4	1	243794	243805	243816	37.68	244377	113.08
M12 x 1.25	D5	4	1	243827	243838	243849	44.19	244388	132.59
M12 x 1.75	D6	4	1	243860	243871	243882	44.19	244399	132.59
M14 x 1.5	D6	4	1	243893	243904	243915	66.08	244410	198.24
M14 x 2.0	D7	4	1	243926	243937	243948	66.08	244421	198.24
M16 x 1.5	D6	4	1	243959	243970	243981	80.53	244432	241.59
M16 x 2.0	D7	4	1	243992	244003	244014	80.53	244443	241.59
M18 x 1.5	D6	4	1	244025	244036	244047	108.42	244454	325.30
M18 x 2.5	D7	4	1	244058	244069	244080	108.42	244465	325.30
M20 x 2.5	D7	4	1	244091	244102	244113	140.25	244476	420.79
M24 x 3.0	D8	4	1	244124	244135	244146	205.25	244487	615.74
M27 x 3.0	D8	4	1	244157	244168	244179	354.75	244498	1,064.28
M30 x 3.5	D9	4	1	244190	244201	244212	453.05	244509	1,359.16
M33 x 3.5	D9	4	1	244223	244234	244245	451.86	244520	1,355.58
M36 x 4.0	D9	4	1	244256	244267	244278	573.07	244531	1,719.18

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203



# Spiral Point Plug Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H1	2	1	207161	21.00
0 - 80	H2	2	1	207172	21.00
1 - 64	H1	2	1	207194	18.95
1 - 64	H2	2	1	207205	18.95
1 - 72	H1	2	1	207227	18.95
1 - 72	H2	2	1	207238	18.95
2 - 56	H1	2	1	207260	18.03
2 - 56	H2	2	1	207271	16.09
2 - 64	H1	2	1	207293	18.03
2 - 64	H2	2	1	207304	18.03
3 - 48	H1	2	1	207326	12.92
3 - 48	H2	2	1	207337	12.92
3 - 56	H1	2	1	207359	15.81
3 - 56	H2	2	1	207370	14.38
4 - 40	H1	2	1	207392	11.79
4 - 40	H2	2	1	207403	10.36
4 - 48	H1	2	1	207436	12.00
4 - 48	H2	2	1	207447	11.79
4 - 36	H2	2	1	207480	11.79
5 - 40	H1	2	1	207513	11.79
5 - 40	H2	2	1	207524	10.36
5 - 44	H2	2	1	207557	11.79
6 - 32	H1	2	1	207590	10.36
6 - 32	H2	2	1	207601	8.73
6 - 32	H3	2	1	207612	8.73
6 - 32	H7	2	1	207645	9.88
6 - 40	H1	2	1	207656	9.88
6 - 40	H2	2	1	207667	9.88
8 - 32	H1	2	1	207700	9.88
8 - 32	H2	2	1	207711	8.73
8 - 32	H3	2	1	207722	8.73
8 - 32	H7	2	1	207755	9.88
8 - 36	H1	2	1	207766	9.88
8 - 36	H2	2	1	207777	9.88
10 - 24	H1	2	1	207810	10.80
10 - 24	H2	2	1	207821	9.88
10 - 24	H3	2	1	207832	8.73
10 - 24	H7	2	1	207865	10.80
10 - 32	H1	2	1	207876	9.88
10 - 32	H2	2	1	207887	8.73
10 - 32	H3	2	1	207898	8.73
10 - 32	H7	2	1	207931	10.80
12 - 24	H1	2	1	207942	9.88
12 - 24	H3	2	1	207953	9.88
12 - 28	H3	2	1	207986	9.88
1/4 - 20	H1	2	1	207997	9.88
1/4 - 20	H2	2	1	208008	9.88
1/4 - 20	H3	2	1	208019	8.73
1/4 - 20	H3	3	1	208052	10.80
1/4 - 20	H5	2	1	208063	9.85

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/4 - 20	H5	3	1	208074	10.80
1/4 - 28	H1	2	1	208085	10.80
1/4 - 28	H2	2	1	208096	9.85
1/4 - 28	H2	3	1	208107	10.80
1/4 - 28	H3	2	1	208118	8.73
1/4 - 28	H4	2	1	208151	10.80
1/4 - 28	H4	3	1	208162	10.80
5/16 - 18	H1	2	1	208173	12.44
5/16 - 18	H2	2	1	208184	10.80
5/16 - 18	H3	2	1	208195	9.41
5/16 - 18	H3	3	1	208228	12.44
5/16 - 18	H5	2	1	208239	10.80
5/16 - 18	H5	3	1	208250	12.44
5/16 - 24	H1	2	1	208261	12.44
5/16 - 24	H2	2	1	208272	12.44
5/16 - 24	H2	3	1	208283	12.44
5/16 - 24	H3	2	1	208294	9.41
5/16 - 24	H4	2	1	208327	12.44
5/16 - 24	H4	3	1	208338	12.44
3/8 - 16	H1	3	1	208349	13.94
3/8 - 16	H2	3	1	208360	12.95
3/8 - 16	H3	3	1	208371	11.15
3/8 - 16	H5	3	1	208404	14.04
3/8 - 24	H1	3	1	208415	14.14
3/8 - 24	H2	3	1	208426	14.14
3/8 - 24	H3	3	1	208437	12.00
3/8 - 24	H4	3	1	208470	14.14
7/16 - 14	H2	3	1	208481	20.69
7/16 - 14	H3	3	1	208492	18.95
7/16 - 14	H5	3	1	208525	20.69
7/16 - 20	H2	3	1	208536	20.69
7/16 - 20	H3	3	1	208547	18.95
7/16 - 20	H5	3	1	208580	20.69
1/2 - 13	H1	3	1	208591	25.32
1/2 - 13	H2	3	1	208602	25.32
1/2 - 13	H3	3	1	208613	19.33
1/2 - 13	H5	3	1	208646	22.80
1/2 - 20	H1	3	1	208657	25.32
1/2 - 20	H2	3	1	208668	25.32
1/2 - 20	H3	3	1	208679	22.70
1/2 - 20	H5	3	1	208712	25.32
9/16 - 12	H3	3	1	208723	31.56
9/16 - 18	H3	3	1	208756	31.56
5/8 - 11	H3	3	1	208789	43.08
5/8 - 11	H5	3	1	208822	43.08
5/8 - 18	H3	3	1	208833	43.08
3/4 - 10	H3	3	1	208866	60.77
3/4 - 10	H5	3	1	208899	60.77
3/4 - 16	H3	3	1	208910	60.77
-	-	-	-	-	-

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

129

HP TAPS

TAPS

DIES

## STEAM OXIDE



HIGH SPEED STEEL

## NITRIDE & STEAM OXIDE



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H2	2	1	207183	24.17
1 - 64	H2	2	1	207216	21.85
1 - 72	H2	2	1	207249	21.85
2 - 56	H2	2	1	207282	18.54
2 - 64	H2	2	1	207315	20.76
3 - 48	H2	2	1	207348	14.86
3 - 56	H2	2	1	207381	16.56
4 - 40	H2	2	1	207425	11.93
4 - 48	H2	2	1	207469	13.60
4 - 36	H2	2	1	207502	13.60
5 - 40	H2	2	1	207546	11.93
5 - 44	H2	2	1	207579	13.60
6 - 32	H3	2	1	207634	10.02
6 - 40	H2	2	1	207689	11.38
8 - 32	H3	2	1	207744	10.02
8 - 36	H2	2	1	207799	11.38
10 - 24	H3	2	1	207854	10.02
10 - 32	H3	2	1	207920	10.02
12 - 24	H3	2	1	207975	11.38
1/4 - 20	H3	2	1	208041	10.02
1/4 - 28	H3	2	1	208140	10.02
5/16 - 18	H3	2	1	208217	10.84
5/16 - 24	H3	2	1	208316	10.84
3/8 - 16	H3	3	1	208393	12.85
3/8 - 24	H3	3	1	208459	13.80
7/16 - 14	H3	3	1	208514	21.85
7/16 - 20	H3	3	1	208569	21.85
1/2 - 13	H3	3	1	208635	22.26
1/2 - 20	H3	3	1	208701	26.11
9/16 - 12	H3	3	1	208745	36.30
9/16 - 18	H3	3	1	208778	36.30
5/8 - 11	H3	3	1	208811	49.56
5/8 - 18	H3	3	1	208855	49.56
3/4 - 10	H3	3	1	208888	69.91
3/4 - 16	H3	3	1	208932	69.91

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H2	2	1	207414	11.93
4 - 48	H2	2	1	207458	13.60
4 - 36	H2	2	1	207491	13.60
5 - 40	H2	2	1	207535	11.93
5 - 44	H2	2	1	207568	13.60
6 - 32	H3	2	1	207623	10.02
6 - 40	H2	2	1	207678	11.38
8 - 32	H3	2	1	207733	10.02
8 - 36	H2	2	1	207788	11.38
10 - 24	H3	2	1	207843	10.02
10 - 32	H3	2	1	207909	10.02
12 - 24	H3	2	1	207964	11.38
1/4 - 20	H3	2	1	208030	10.02
1/4 - 28	H3	2	1	208129	10.02
5/16 - 18	H3	2	1	208206	10.84
5/16 - 24	H3	2	1	208305	10.84
3/8 - 16	H3	3	1	208382	12.85
3/8 - 24	H3	3	1	208448	13.80
7/16 - 14	H3	3	1	208503	21.85
7/16 - 20	H3	3	1	208558	21.85
1/2 - 13	H3	3	1	208624	22.26
1/2 - 20	H3	3	1	208690	26.11
9/16 - 12	H3	3	1	208734	36.30
9/16 - 18	H3	3	1	208767	36.30
5/8 - 11	H3	3	1	208800	49.56
5/8 - 18	H3	3	1	208844	49.56
3/4 - 10	H3	3	1	208877	69.91
3/4 - 16	H3	3	1	208921	69.91

**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 TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Spiral Point Plug Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**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	31.07
2-56	H2	2	1	214784	24.93
4-40	H2	2	1	214795	17.63
5-40	H2	2	1	214806	17.63
6-32	H3	2	1	214817	16.47
8-32	H3	2	1	214828	16.47
10-24	H3	2	1	214839	16.47
10-32	H3	2	1	214850	16.47
12-24	H3	2	1	214861	17.99
12-28	H3	2	1	214872	17.99
1/4-20	H3	2	1	214883	16.47
1/4-28	H3	2	1	214894	16.47
5/16-18	H3	2	1	214905	18.03
5/16-24	H3	2	1	214916	18.03
3/8-16	H3	3	1	214927	21.17
3/8-24	H3	3	1	214938	22.26
7/16-14	H3	3	1	214949	35.01
7/16-20	H3	3	1	214960	35.01
1/2-13	H3	3	1	214971	35.48
1/2-20	H3	3	1	214982	39.63
5/8-11	H3	3	1	214993	82.01
5/8-18	H3	3	1	215004	82.01
3/4-10	H3	3	1	215015	107.09
3/4-16	H3	3	1	215026	107.09

**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	31.07
2-56	H2	2	1	214058	24.93
4-40	H2	2	1	214069	17.63
5-40	H2	2	1	214080	17.63
6-32	H3	2	1	214091	16.47
8-32	H3	2	1	214102	16.47
10-24	H3	2	1	214113	16.47
10-32	H3	2	1	214124	16.47
12-24	H3	2	1	214135	17.99
12-28	H3	2	1	214146	17.99
1/4-20	H3	2	1	214157	16.47
1/4-28	H3	2	1	214168	16.47
5/16-18	H3	2	1	214179	18.03
5/16-24	H3	2	1	214190	18.03
3/8-16	H3	3	1	214201	21.17
3/8-24	H3	3	1	214212	22.26
7/16-14	H3	3	1	214223	35.01
7/16-20	H3	3	1	214234	35.01
1/2-13	H3	3	1	214245	35.48
1/2-20	H3	3	1	214256	39.63
5/8-11	H3	3	1	214267	82.01
5/8-18	H3	3	1	214278	82.01
3/4-10	H3	3	1	214289	107.09
3/4-16	H3	3	1	214300	107.09

**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.

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

131

HP TAPS

TAPS

DIES

HP TAPS

TAPS

DIES

## SPIRAL POINT PLUG TAPS



**HIGH SPEED STEEL  
METRIC  
UNCOATED**



**HIGH SPEED STEEL  
METRIC  
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	211847	23.25
M2.5 x 0.45	D3	2	1	211858	16.67
M3 x 0.5	D3	2	1	211869	13.39
M3.5 x 0.6	D4	2	1	211880	11.55
M4 x 0.7	D4	2	1	211891	11.55
M4.5 x 0.75	D4	2	1	211902	11.55
M5 x 0.8	D4	2	1	211913	11.55
M6 x 1.0	D5	2	1	211924	11.55
M7 x 1.0	D5	2	1	211935	13.36
M8 x 1.25	D5	2	1	211946	13.36
M10 x 1.50	D6	3	1	211957	22.19
M12 x 1.75	D6	3	1	211968	27.78
M14 x 2.0	D7	3	1	211979	43.12
M16 x 2.0	D7	3	1	211990	48.84
M18 x 2.5	D7	3	1	212001	71.85
M20 x 2.5	D7	3	1	212012	94.82

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	233220	32.05
M2.5 x 0.45	D3	2	1	233231	22.98
M3 x 0.5	D3	2	1	233242	18.50
M3.5 x 0.6	D4	2	1	233253	15.93
M4 x 0.7	D4	2	1	233264	15.93
M4.5 x 0.75	D4	2	1	233275	15.93
M5 x 0.8	D4	2	1	233286	15.93
M6 x 1.0	D5	2	1	233297	15.93
M7 x 1.0	D5	2	1	233308	18.39
M8 x 1.25	D5	2	1	233319	18.39
M10 x 1.50	D6	3	1	233330	30.56
M12 x 1.75	D6	3	1	233341	38.30
M14 x 2.0	D7	3	1	233352	59.40
M16 x 2.0	D7	3	1	233363	67.31
M18 x 2.5	D7	3	1	233374	98.99
M20 x 2.5	D7	3	1	233385	130.68

## SPIRAL POINT BOTTOMING TAPS



**HIGH SPEED STEEL  
UNCOATED**



**HIGH SPEED STEEL  
TIN COATED**

SIZE	H-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H2	2	1	208943	38.66
2 - 56	H2	2	1	208954	29.63
3 - 48	H2	2	1	208965	23.77
4 - 40	H2	2	1	208976	19.08
5 - 40	H2	2	1	208987	19.08
6 - 32	H2	2	1	208998	16.04
6 - 32	H3	2	1	209009	16.04
6 - 40	H2	2	1	209020	18.25
8 - 32	H2	2	1	209031	16.04
8 - 32	H3	2	1	209042	16.04
10 - 24	H2	2	1	209053	18.25
10 - 24	H3	2	1	209064	16.04
10 - 32	H2	2	1	209075	16.04
10 - 32	H3	2	1	209086	16.04
12 - 24	H3	2	1	209097	18.25
1/4 - 20	H3	2	1	209108	16.04
1/4 - 28	H3	2	1	209119	16.04
5/16 - 18	H3	2	1	209130	17.31
5/16 - 24	H3	2	1	209141	17.31

SIZE	H-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H2	2	1	259263	52.19
2 - 56	H2	2	1	259274	39.99
3 - 48	H2	2	1	259285	32.09
4 - 40	H2	2	1	259296	25.75
5 - 40	H2	2	1	259307	25.75
6 - 32	H2	2	1	259318	21.66
6 - 32	H3	2	1	259329	21.66
6 - 40	H2	2	1	259340	24.63
8 - 32	H2	2	1	259351	21.66
8 - 32	H3	2	1	259362	21.66
10 - 24	H2	2	1	259373	24.63
10 - 24	H3	2	1	259384	21.66
10 - 32	H2	2	1	259395	21.66
10 - 32	H3	2	1	259406	21.66
12 - 24	H3	2	1	259417	24.63
1/4 - 20	H3	2	1	259428	21.66
1/4 - 28	H3	2	1	259439	21.66
5/16 - 18	H3	2	1	259450	23.36
5/16 - 24	H3	2	1	259461	23.36

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

FOR COATING INFORMATION SEE PAGE 5.

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Spiral Flute Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	35.48
3 - 56	H2	2	1	198515	35.48
4 - 40	H2	2	1	198526	29.19
4 - 48	H2	2	1	198537	29.19
5 - 40	H3	2	1	198548	29.19
5 - 44	H3	2	1	198559	29.19
6 - 32	H3	2	1	198570	23.70
6 - 40	H3	2	1	198581	23.70
8 - 32	H3	3	1	198592	23.70
8 - 36	H3	3	1	198603	23.70
10 - 24	H3	3	1	198614	23.70
10 - 32	H3	3	1	198625	23.70
12 - 24	H3	3	1	198636	25.72
12 - 28	H3	3	1	198647	25.72
1/4 - 20	H3	3	1	198658	25.72
1/4 - 28	H3	3	1	198669	25.72
5/16 - 18	H3	3	1	198680	31.68
5/16 - 24	H3	3	1	198691	31.68
3/8 - 16	H3	3	1	198702	36.56
3/8 - 24	H3	3	1	198713	36.56
7/16 - 14	H3	3	1	198724	54.81
7/16 - 20	H3	3	1	198735	54.81
1/2 - 13	H3	3	1	198746	65.97
1/2 - 20	H3	3	1	198757	65.97
9/16 - 12	H3	4	1	198768	110.05
9/16 - 18	H3	4	1	198779	110.05
5/8 - 11	H3	4	1	198790	143.61
5/8 - 18	H3	4	1	198801	143.61
3/4 - 10	H3	4	1	198812	183.82
3/4 - 16	H3	4	1	198823	183.82

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M3 x 0.5	D3	2	1	198834	30.02
M3.5 x 0.6	D4	3	1	198845	24.31
M4 x 0.7	D4	3	1	198856	24.31
M4.5 x 0.75	D4	3	1	198867	24.31
M5 x 0.8	D4	3	1	198878	24.31
M6 x 1.0	D5	3	1	198889	26.55
M8 x 1.25	D5	3	1	198900	32.73
M10 x 1.5	D6	3	1	198911	56.58
M12 x 1.75	D6	3	1	198922	68.10

- 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 TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

133

HP TAPS

TAPS

DIES



# Thread Forming Taps

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**HIGH SPEED STEEL UNCOATED**



**HIGH SPEED STEEL METRIC UNCOATED**

HP TAPS

TAPS

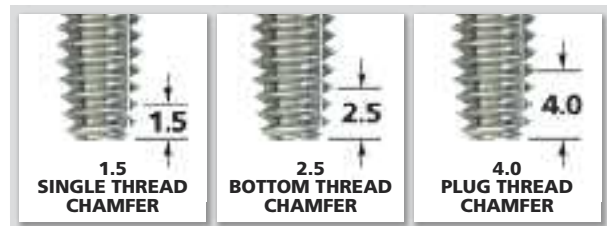
DIES

SIZE	H LIMIT	# OF LUBE GROOVES	PKG. QTY.	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
0-80	H2	0	1	262664	257987	-	27.95
0-80	H3	0	1	262675	257998	-	27.95
1-64	H3	0	1	-	258009	-	27.95
1-72	H3	0	1	262686	258020	-	27.95
2-56	H3	0	1	262697	258031	-	27.77
2-56	H4	0	1	262708	258042	-	27.77
2-64	H3	0	1	-	258064	-	27.77
3-48	H3	0	1	-	258086	-	27.77
3-56	H3	0	1	-	258097	-	27.77
3-56	H5	0	1	-	258108	-	27.77
4-40	H3	0	1	262719	258130	258119	25.03
4-40	H5	0	1	262730	258152	258141	25.03
4-48	H4	0	1	-	258174	-	25.03
5-40	H4	0	1	-	258218	258207	25.03
5-44	H4	0	1	-	258262	-	25.03
6-32	H3	1	1	262741	258306	258295	20.63
6-32	H5	1	1	262752	258328	258317	20.63
6-40	H4	1	1	-	258372	258361	20.63
8-32	H3	1	1	262763	258416	258405	20.63
8-32	H5	1	1	262774	258438	258427	20.63
8-32	H7	1	1	-	258460	258449	20.63
8-36	H4	1	1	-	258482	258471	20.63
10-24	H5	1	1	-	258504	258493	19.84
10-24	H7	1	1	-	258526	258515	19.84
10-32	H3	1	1	262785	258548	258537	19.84
10-32	H5	1	1	262796	258570	258559	19.84
12-24	H5	2	1	-	258592	258581	19.84
12-28	H4	2	1	-	258636	258625	19.84
1/4-20	H5	2	1	262807	258658	258647	21.06
1/4-20	H8	2	1	262818	258680	258669	21.06
1/4-28	H4	2	1	262829	258724	258713	21.06
1/4-28	H6	2	1	262840	258746	258735	21.06
5/16-18	H5	2	1	-	258768	258757	23.39
5/16-18	H8	2	1	262851	258790	258779	23.39
5/16-24	H5	2	1	262862	258812	258801	23.39
5/16-24	H7	2	1	262873	258834	258823	23.39
3/8-16	H6	2	1	262884	258856	258845	26.70
3/8-16	H8	2	1	262895	258878	258867	26.70
3/8-24	H5	2	1	262906	258900	258889	26.70
3/8-24	H7	2	1	262917	258922	258911	26.70
7/16-14	H7	4	1	-	258944	258933	40.62
7/16-14	H9	4	1	-	258966	258955	40.62
7/16-20	H5	4	1	-	258988	258977	40.62
7/16-20	H8	4	1	-	259010	258999	40.62
1/2-13	H7	6	1	-	259032	259021	45.43
1/2-13	H10	6	1	-	259054	259043	45.43
1/2-20	H5	6	1	-	259076	259065	45.43
1/2-20	H8	6	1	-	259098	259087	45.43

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

SIZE	D LIMIT	# OF LUBE GROOVES	PKG. QTY.	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
M1.6 x .35	D5	0	1	-	263412	-	23.00
M1.7 x .35	D5	0	1	-	263423	-	23.00
M2 x 0.4	D5	0	1	262928	263434	-	23.00
M2.5 x .45	D6	0	1	262939	263445	-	23.00
M3 x 0.5	D6	0	1	262950	259120	-	23.00
M3.5 x 0.6	D7	1	1	262961	263467	263456	20.75
M4 x 0.7	D7	1	1	262972	259142	259131	20.75
M5 x 0.8	D8	1	1	262983	259164	259153	20.75
M6 x 1.0	D9	2	1	262994	259186	259175	22.01
M8 x 1.25	D10	2	1	263005	259208	259197	25.18
M10 x 1.5	D11	2	1	263016	259230	259219	28.34
M12 x 1.75	D12	4	1	263027	259252	259241	48.89

Plug Tap sizes M10 and smaller have male centers



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

**FOR TECHNICAL INFORMATION PLEASE SEE PAGES 205 & 206**

**FOR COATING OPTIONS AVAILABLE ON OUR THREAD FORMING TOOLS, PLEASE SEE PAGE 5**

# Thread Forming Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**HIGH SPEED STEEL  
TIN COATED**



**HIGH SPEED STEEL  
METRIC  
TIN COATED**

SIZE	H LIMIT	# OF LUBE GROOVES	PKG. QTY.	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
0-80	H2	0	1	263038	209669	-	34.94
0-80	H3	0	1	263049	209680	-	34.94
1-64	H3	0	1	-	209691	-	34.94
1-72	H3	0	1	263060	209702	-	34.94
2-56	H3	0	1	263071	209713	-	34.71
2-56	H4	0	1	263082	209724	-	34.71
2-64	H3	0	1	-	209746	-	34.71
3-48	H3	0	1	-	209768	-	34.71
3-56	H3	0	1	-	209779	-	34.71
3-56	H5	0	1	-	209790	-	34.71
4-40	H3	0	1	263093	209812	209801	31.29
4-40	H5	0	1	263104	209834	209823	31.29
4-48	H4	0	1	-	209856	-	31.29
5-40	H4	0	1	-	209900	209889	31.29
5-44	H4	0	1	-	209944	-	31.29
6-32	H3	1	1	263115	209988	209977	25.78
6-32	H5	1	1	263126	210010	209999	25.78
6-40	H4	1	1	-	210054	210043	25.78
8-32	H3	1	1	263137	210098	210087	25.78
8-32	H5	1	1	263148	210120	210109	25.78
8-32	H7	1	1	-	210142	210131	25.78
8-36	H4	1	1	-	210164	210153	25.78
10-24	H5	1	1	-	210186	210175	24.80
10-24	H7	1	1	-	210208	210197	24.80
10-32	H3	1	1	263159	210230	210219	24.80
10-32	H5	1	1	263170	210252	210241	24.80
12-24	H5	2	1	-	210274	210263	24.80
12-28	H4	2	1	-	210318	210307	24.80
1/4-20	H5	2	1	263181	210340	210329	26.34
1/4-20	H8	2	1	263192	210362	210351	26.34
1/4-28	H4	2	1	263203	210406	210395	26.34
1/4-28	H6	2	1	263214	210428	210417	26.34
5/16-18	H5	2	1	-	210450	210439	29.24
5/16-18	H8	2	1	263225	210472	210461	29.24
5/16-24	H5	2	1	263236	210494	210483	29.24
5/16-24	H7	2	1	263247	210516	210505	29.24
3/8-16	H6	2	1	263258	210538	210527	33.37
3/8-16	H8	2	1	263269	210560	210549	33.37
3/8-24	H5	2	1	263280	210582	210571	33.37
3/8-24	H7	2	1	263291	210604	210593	33.37
7/16-14	H7	4	1	-	210626	210615	50.78
7/16-14	H9	4	1	-	210648	210637	50.78
7/16-20	H5	4	1	-	210670	210659	50.78
7/16-20	H8	4	1	-	210692	210681	50.78
1/2-13	H7	6	1	-	210714	210703	56.79
1/2-13	H10	6	1	-	210736	210725	56.79
1/2-20	H5	6	1	-	210758	210747	56.79
1/2-20	H8	6	1	-	210780	210769	56.79

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

SIZE	D LIMIT	# OF LUBE GROOVES	PKG. QTY.	1.5 ITEM#	2.5 ITEM#	4.0 ITEM#	LIST PRICE
M1.6 x .35	D5	0	1	-	263478	-	28.00
M1.7 x .35	D5	0	1	-	263489	-	28.00
M2 x 0.4	D5	0	1	263302	263500	-	28.00
M2.5 x .45	D6	0	1	263313	263511	-	28.00
M3 x 0.5	D6	0	1	263324	199340	-	28.00
M3.5 x 0.6	D7	1	1	263335	263533	263522	25.95
M4 x 0.7	D7	1	1	263346	199362	199351	25.95
M5 x 0.8	D8	1	1	263357	199384	199373	25.95
M6 x 1.0	D9	2	1	263368	199406	199395	27.51
M8 x 1.25	D10	2	1	263379	199428	199417	31.49
M10 x 1.5	D11	2	1	263390	199450	199439	35.41
M12 x 1.75	D12	4	1	263401	199472	199461	61.12

Plug Tap sizes M10 and smaller have male center



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

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 205 & 206

FOR COATING OPTIONS AVAILABLE ON OUR THREAD FORMING TOOLS, PLEASE SEE PAGE 5

HP TAPS

TAPS

DIES



**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	38.87
5-40	0.141	1-15/16	9/32	0.1040	13/32	2	1	198262	38.87
6-32	0.141	2	5/16	0.1115	7/16	2	1	198273	38.87
8-32	0.168	2-1/8	3/8	0.1375	1/2	2	1	198284	38.87
10-24	0.194	2-3/8	13/32	0.1545	5/8	2	1	198295	38.87
10-32	0.194	2-3/8	13/32	0.1635	5/8	2	1	198306	38.87
12-24	0.220	2-3/8	15/32	0.1805	21/32	2	1	198317	42.02
1/4-20	0.255	2-1/2	17/32	0.2080	25/32	2	1	198328	38.87
1/4-28	0.255	2-1/2	17/32	0.2200	25/32	2	1	198339	38.87
5/16-18	0.318	2-27/32	11/16	0.2660	15/16	2	1	198350	57.41
5/16-24	0.318	2-27/32	11/16	0.2770	15/16	2	1	198361	57.41
3/8-16	0.381	3-3/8	13/16	0.3225	1-1/16	2	1	198372	69.76
3/8-24	0.381	3-3/8	13/16	0.3395	1-1/16	2	1	198383	69.76
7/16-14	0.323	3-3/4	1	0.3770	1-1/4	2	1	198394	83.49
7/16-20	0.323	3-3/4	1	0.3955	1-1/4	2	1	198405	83.49
1/2-13	0.367	4-1/16	1-1/8	0.4350	1-3/8	2	1	198416	94.22
1/2-20	0.367	4-1/16	1-1/8	0.4580	1-3/8	2	1	198427	94.22

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	42.78
M5 x 0.8	0.194	2-3/8	13/32	0.1700	5/8	2	1	198449	42.78
M6 x 1.0	0.255	2-1/2	17/32	0.2030	25/32	2	1	198460	42.78
M8 x 1.25	0.318	2-27/32	11/16	0.2730	15/16	2	1	198471	77.50
M10 x 1.50	0.381	3.38	13/16	0.3440	0.69	2	1	198482	88.55
M12 x 1.75	0.367	4-1/16	1-1/8	0.4140	1-3/8	2	1	198493	88.55

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

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

# Taper Pipe Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	33.35	233396	38.37	233407	43.39
1/8 - 27*	4	1	212034	33.35	233418	38.37	233429	43.39
1/8 - 27	4	1	212045	33.35	233440	38.37	233451	43.39
1/4 - 18	4	1	212056	36.92	233462	42.45	233473	48.01
3/8 - 18	4	1	212067	48.59	233484	55.89	233495	63.15
1/2 - 14	4	1	212078	77.28	233506	88.88	233517	100.44
3/4 - 14	5	1	212089	108.10	233528	124.32	233539	140.54
1 - 11-1/2	5	1	212100	164.28	233550	188.88	233561	196.94
1-1/4 - 11-1/2	5	1	212111	234.15	233572	269.27	233583	304.38
1-1/2 - 11-1/2	7	1	212122	314.07	233594	361.21	233605	408.29
2 - 11-1/2	7	1	212133	427.22	233616	491.31	233627	555.41

\* 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	51.74	233638	59.50	233649	67.27
1/8 - 27	5	1	212155	51.74	233660	59.50	233671	67.27
1/4 - 18	5	1	212166	57.23	233682	65.79	233693	74.39
3/8 - 18	5	1	212177	72.40	233704	83.24	233715	94.12
1/2 - 14	5	1	212188	115.14	233726	132.41	233737	149.68
3/4 - 14	5	1	212199	167.56	233748	192.67	233759	217.82
1 - 11-1/2	5	1	212210	254.63	233770	292.82	233781	331.01
1-1/4 - 11-1/2	5	1	212221	360.60	233792	414.68	233803	468.77
1-1/2 - 11-1/2	7	1	212232	483.69	233814	556.24	233825	628.78
2 - 11-1/2	7	1	212243	653.68	233836	751.73	233847	849.75

\* SMALL SHANK

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

**NPTF DRYSEAL  
HIGH SPEED STEEL**



**UNCOATED**



**TIN COATED**

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	212254	36.71
1/8 - 27*	4	1	212265	36.71
1/8 - 27	4	1	212276	36.71
1/4 - 18	4	1	212287	40.61
3/8 - 18	4	1	212298	53.43
1/2 - 14	4	1	212309	85.01
3/4 - 14	5	1	212320	118.90
1 - 11-1/2	5	1	212331	180.68
1-1/4 - 11-1/2	5	1	212342	257.56
1-1/2 - 11-1/2	7	1	212353	345.46
2 - 11-1/2	7	1	212364	469.96

\* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	245700	54.99
1/8 - 27*	4	1	245711	54.99
1/8 - 27	4	1	245722	54.99
1/4 - 18	4	1	245733	60.84
3/8 - 18	4	1	245744	80.06
1/2 - 14	4	1	245755	127.32
3/4 - 14	5	1	245766	178.11
1 - 11-1/2	5	1	245777	270.68
1-1/4 - 11-1/2	5	1	245788	385.82
1-1/2 - 11-1/2	7	1	245799	517.54
2 - 11-1/2	7	1	245810	704.00

\* 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	56.90
1/8 - 27	5	1	212386	56.90
1/4 - 18	5	1	212397	62.94
3/8 - 18	5	1	212408	79.63
1/2 - 14	5	1	212419	126.67
3/4 - 14	5	1	212430	184.29
1 - 11-1/2	5	1	212441	280.07
1-1/4 - 11-1/2	5	1	212452	396.62
1-1/2 - 11-1/2	7	1	212463	532.07
2 - 11-1/2	7	1	212474	719.03

\* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27*	5	1	212475	85.26
1/8 - 27	5	1	212476	85.26
1/4 - 18	5	1	212477	94.30
3/8 - 18	5	1	212478	119.30
1/2 - 14	5	1	212479	189.71
3/4 - 14	5	1	212480	276.10
1 - 11-1/2	5	1	212481	419.56
1-1/4 - 11-1/2	5	1	212482	594.17
1-1/2 - 11-1/2	7	1	212483	797.00
2 - 11-1/2	7	1	212484	1,077.10

\* SMALL SHANK

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203



# Pipe Taps

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT PIPE - NPS HIGH SPEED STEEL



UNCOATED



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212683	53.29
1/4 - 18	4	1	212694	58.96
3/8 - 18	4	1	212705	77.60
1/2 - 14	4	1	212716	123.45
3/4 - 14	5	1	212727	172.66
1 - 11-1/2	5	1	212738	262.37

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212740	79.84
1/4 - 18	4	1	212742	88.33
3/8 - 18	4	1	212744	116.26
1/2 - 14	4	1	212745	184.91
3/4 - 14	5	1	212746	258.65
1 - 11-1/2	5	1	212747	393.04

## 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	99.90
1/4 - 18	4	6	1	212760	115.14
3/8 - 18	4	6	1	212771	155.79
1/2 - 14	4	6	1	212782	250.01



TIN COATED

SIZE	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	6	1	212784	149.64
1/4 - 18	4	6	1	212786	172.51
3/8 - 18	4	6	1	212788	233.39
1/2 - 14	4	6	1	212790	374.51

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

MADE IN USA

## STI - SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H1	2	1	209262	25.29
5 - 40	H1	2	1	209273	25.29
6 - 32	H2	2	1	209284	25.47
6 - 40	H2	2	1	209295	25.47
8 - 32	H2	2	1	209306	25.72
10 - 24	H2	2	1	209317	26.19
10 - 32	H2	2	1	209328	26.66
12 - 24	H2	2	1	209339	26.66
1/4 - 20	H2	2	1	209350	26.66
1/4 - 28	H2	2	1	209361	27.10
5/16 - 18	H3	3	1	209372	34.25
5/16 - 24	H2	3	1	209383	34.68
3/8 - 16	H3	3	1	209394	42.16
3/8 - 24	H2	3	1	209405	42.67
7/16 - 14	H3	3	1	209416	46.24
7/16 - 20	H3	3	1	209427	46.24
1/2 - 13	H3	3	1	209438	51.48
1/2 - 20	H3	3	1	209449	51.48

## 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	22.54
5 - 40	H1	3	1	198955	198966	22.54
6 - 32	H2	3	1	198977	198988	22.94
6 - 40	H1	3	1	198999	199010	22.94
8 - 32	H2	3	1	199021	199032	23.48
10 - 24	H2	3	1	199043	199054	23.48
10 - 32	H2	3	1	199065	199076	24.42
12 - 24	H2	3	1	199087	199098	24.42
1/4 - 20	H2	3	1	199109	199120	24.53
1/4 - 28	H2	3	1	199131	199142	24.53
5/16 - 18	H3	4	1	199153	199164	26.48
5/16 - 24	H2	4	1	199175	199186	26.48
3/8 - 16	H3	4	1	199197	199208	28.76
3/8 - 24	H2	4	1	199219	199230	28.76
7/16 - 14	H3	4	1	199241	199252	39.56
7/16 - 20	H3	4	1	199263	199274	39.56
1/2 - 13	H3	4	1	199285	199296	44.40
1/2 - 20	H3	4	1	199307	199318	44.40

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	13.08
8 - 32	H11	2	1	209163	13.08
10 - 24	H11	2	1	209174	14.23
10 - 32	H11	2	1	209185	14.23
1/4 - 20	H11	2	1	209196	16.22
5/16 - 18	H11	2	1	209207	18.64
3/8 - 16	H11	3	1	209218	21.17
7/16 - 14	H11	3	1	209229	31.79
1/2 - 13	H11	3	1	209240	38.69
5/8 - 11	H11	3	1	209251	65.93

## + .005 OVERSIZE HAND PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
6 - 32	H11	3	1	207051	10.87
8 - 32	H11	4	1	207062	10.87
10 - 24	H11	4	1	207073	12.03
10 - 32	H11	4	1	207084	12.03
1/4 - 20	H11	4	1	207095	14.34
5/16 - 18	H11	4	1	207106	18.06
3/8 - 16	H11	4	1	207117	20.74
7/16 - 14	H11	4	1	207128	30.02
1/2 - 13	H11	4	1	207139	35.23
5/8 - 11	H11	4	1	207150	66.33

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

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

## 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	76.74
1/4 - 20	H3	4	8	1	209471	94.87
5/16 - 18	H3	4	6	1	209482	80.93
5/16 - 18	H3	4	8	1	209493	97.69
3/8 - 16	H3	4	6	1	209504	90.68
3/8 - 16	H3	4	8	1	209515	108.82
3/8 - 16	H3	4	10	1	209526	136.75
7/16 - 14	H3	4	6	1	209537	96.28
7/16 - 14	H3	4	8	1	209548	125.58
1/2 - 13	H3	4	6	1	209559	97.69

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/2 - 13	H3	4	8	1	209570	128.37
1/2 - 13	H3	4	10	1	209581	157.67
1/2 - 13	H3	4	12	1	209592	193.94
5/8 - 11	H3	4	6	1	209603	129.77
5/8 - 11	H3	4	8	1	209614	168.83
5/8 - 11	H3	4	10	1	209625	212.11
5/8 - 11	H3	4	12	1	209636	248.38
3/4 - 10	H3	4	10	1	209647	248.38
3/4 - 10	H3	4	12	1	209658	295.82
-	-	-	-	-	-	-

## 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	77.86
8 - 32	H3	6	NC	3/4	1/4	0.123	0.092	2	1	212496	76.27
10 - 24	H3	6	NC	7/8	1/4	0.136	0.102	2	1	212507	71.50
10 - 32	H3	6	NF	7/8	1/4	0.136	0.102	2	1	212518	71.50
1/4 - 20	H3	6	NC	1	5/16	0.185	0.139	2	1	212529	97.55
1/4 - 28	H3	6	NF	1	5/16	0.185	0.139	2	1	212540	97.55
5/16 - 18	H3	6	NC	1-1/8	3/8	0.240	0.180	2	1	212551	102.39
5/16 - 24	H3	6	NF	1-1/8	3/8	0.240	0.180	2	1	212562	102.39
3/8 - 16	H3	6	NC	1-1/4	7/16	0.275	0.206	3	1	212573	110.30
3/8 - 24	H3	6	NF	1-1/4	7/16	0.275	0.206	3	1	212584	110.30
7/16 - 14	H3	6	NC	1-7/16	13/32	0.323	0.242	3	1	212595	126.45
7/16 - 20	H3	6	NF	1-7/16	13/32	0.323	0.242	3	1	212606	126.45
1/2 - 13	H3	6	NC	1-21/32	7/16	0.367	0.275	3	1	212617	132.74
1/2 - 20	H3	6	NF	1-21/32	7/16	0.367	0.275	3	1	212628	132.74
5/8 - 11	H3	6	NC	1-13/16	9/16	0.480	0.360	3	1	212639	171.50
5/8 - 18	H3	6	NF	1-13/16	9/16	0.480	0.360	3	1	212650	171.50
3/4 - 10	H3	6	NC	2	11/16	0.590	0.442	3	1	212661	222.73
3/4 - 16	H3	6	NF	2	11/16	0.590	0.442	3	1	212672	222.73

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

FOR TECHNICAL INFORMATION PLEASE SEE PAGE 203

## ADJUSTABLE ROUND SPLIT



HIGH SPEED STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
4-40	1	171708	61.96
5-40	13/16	171719	51.16
5-44	13/16	171730	51.16
6-32	13/16	171741	51.16
6-32	1	171752	61.96
6-40	13/16	171763	51.16
8-32	13/16	171774	51.16
8-32	1	171785	61.96
10-24	13/16	171796	51.16
10-24	1	171807	61.96
10-32	13/16	171818	51.16
10-32	1	171829	61.96
12-24	13/16	171840	51.16
12-24	1	171851	61.96
12-28	13/16	171862	51.16
1/4-20	13/16	171873	51.16
1/4-20	1	171884	61.96

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
1/4-20	1-1/2	171895	101.32
1/4-28	13/16	171906	51.16
1/4-28	1	171917	61.96
1/4-28	1-1/2	171928	101.32
5/16-18	13/16	171939	51.16
5/16-18	1	171950	61.96
5/16-18	1-1/2	171961	101.32
5/16-24	13/16	171972	51.16
5/16-24	1	171983	61.96
5/16-24	1-1/2	171994	101.32
3/8-16	1	172005	61.96
3/8-16	1-1/2	172016	101.32
3/8-24	1	172027	61.96
3/8-24	1-1/2	172038	101.32
7/16-14	1	172049	61.96
7/16-14	1-1/2	172060	101.32
7/16-20	1	172071	61.96

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
7/16-20	1-1/2	172082	101.32
1/2-13	1	172093	61.96
1/2-13	1-1/2	172104	101.32
1/2-20	1	172115	61.96
1/2-20	1-1/2	172126	101.32
9/16-12	1-1/2	172137	101.32
9/16-18	1-1/2	172148	101.32
5/8-11	1-1/2	172159	101.32
5/8-11	2	172170	137.72
5/8-18	1-1/2	172181	101.32
5/8-18	2	172192	137.72
3/4-10	1-1/2	172203	101.32
3/4-10	2	172214	137.72
3/4-16	1-1/2	172225	101.32
3/4-16	2	172236	137.72
7/8-9	2	172247	137.72
7/8-14	2	172258	137.72

## DIE STOCKS



SIZE	ITEM#	LIST PRICE
1 OD	170201	46.13
1-1/2 OD	170212	75.54
2 OD	170223	132.99

HP TAPS

TAPS

DIES

# Carbon Steel Dies

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## ADJUSTABLE ROUND SPLIT



CARBON STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
6-32	1	170377	40.29
8-32	1	170410	40.29
10-24	1	170443	40.29
10-32	1	170465	40.29
1/4-20	1	170531	40.29
1/4-20	1-1/2	170542	65.92
1/4-28	1	170553	40.29
1/4-32	1	170586	40.29
5/16-18	1	170597	40.29
5/16-18	1-1/2	170608	65.92
5/16-24	1	170619	40.29
5/16-24	1-1/2	170630	65.92
5/16-32	1	170641	40.29

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
3/8-16	1	170652	40.29
3/8-16	1-1/2	170663	65.92
3/8-24	1	170674	40.29
3/8-24	1-1/2	170685	65.92
7/16-14	1	170696	40.29
7/16-14	1-1/2	170707	65.92
7/16-20	1	170718	40.29
1/2-13	1-1/2	170740	65.92
1/2-20	1-1/2	170751	65.92
9/16-12	1-1/2	170762	65.92
9/16-18	1-1/2	170773	65.92
5/8-11	1-1/2	170784	65.92
5/8-18	1-1/2	170806	65.92

## HEXAGON RETHREADING



CARBON STEEL

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/4-20	19/32	1/4	171037	23.62
1/4-28	19/32	1/4	171048	23.62
5/16-18	11/16	5/16	171059	27.54
5/16-24	11/16	5/16	171070	27.54
3/8-16	25/32	3/8	171081	30.50
3/8-24	25/32	3/8	171092	30.50
7/16-14	7/8	7/16	171103	37.37
7/16-20	7/8	7/16	171114	37.37
1/2-13	1-1/16	1/2	171125	41.33
1/2-20	1-1/16	1/2	171136	41.33
9/16-12	1-1/16	1/2	171147	44.25
9/16-18	1-1/16	1/2	171158	44.25
5/8-11	1-1/4	5/8	171169	46.23
5/8-18	1-1/4	5/8	171180	46.23
11/16-11	1-7/16	3/4	171191	51.16
11/16-16	1-7/16	3/4	171202	51.16

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
3/4-10	1-7/16	3/4	171213	57.07
3/4-16	1-7/16	3/4	171224	57.07
7/8-9	1-5/8	7/8	171235	61.96
7/8-14	1-5/8	7/8	171246	61.96
1-8	1-13/16	1	171257	69.85
1-12	1-13/16	1	171268	69.85
1-14	1-13/16	1	171279	69.85
1-1/8-7	2	1	171290	80.65
1-1/8-12	2	1	171301	80.65
1-1/4-7	2-3/16	1	171312	88.53
1-1/4-12	2-3/16	1	171323	88.53
1-3/8-6	2-3/8	1	171334	167.24
1-3/8-12	2-3/8	1	171345	167.24
1-1/2-6	2-9/16	1	171356	186.90
1-1/2-12	2-9/16	1	171367	186.90
-	-	-	-	-

MADE IN USA

143

HP TAPS

TAPS

DIES





**NPT HEXAGON  
RETHREADING  
CARBON STEEL**

SIZE	ACROSS THE FLATS	THICKNESS	ITEM#	LIST PRICE
1/8 – 27 NPT	1-1/16	3/8	171576	32.65
1/4 – 18 NPT	1-1/4	5/8	171587	36.19
3/8 – 18 NPT	1-7/16	5/8	171598	50.05
1/2 – 14 NPT	1-5/8	3/4	171609	72.31
3/4 – 14 NPT	2	13/16	171620	89.40
1 – 11-1/2 NPT	2-3/8	1	171631	173.07



**METRIC HEXAGON  
RETHREADING  
CARBON STEEL**

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M3 x 0.5	1	171378	17.99
M4 x 0.7	1	171389	17.51
M5 x 0.8	1	171400	17.51
M6 x 1.0	1	171411	17.51
M7 x 1.0	1	171422	17.99
M8 x 1.25	1	171433	17.51
M10 x 1.25	1	171444	17.51
M10 x 1.50	1	171455	17.51
M12 x 1.25	1	171466	17.51

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M12 x 1.75	1	171477	17.51
M14 x 1.50	1-7/16	171488	27.16
M14 x 2.0	1-7/16	171499	27.16
M16 x 1.50	1-7/16	171510	27.16
M16 x 2.0	1-7/16	171521	27.16
M18 x 1.50	1-7/16	171532	27.16
M18 x 2.50	1-7/16	171543	27.16
M20 x 2.5	1-13/16	171554	56.72
M24 x 3.0	1-13/16	171565	56.72

**T-HANDLE  
TAP WRENCHES**



SIZE	ITEM#	LIST PRICE
0 – 1/4	170146	14.94
1/4 – 1/2	170157	22.37

HP TAPS

TAPS

DIES

# Drill Sets

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



**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	39.45
13Pc. • 1/16" - 1/4" by 64ths • 118° Point • Bright	120118	39.45
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Oxided	120140	110.16
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Bright	120162	110.16
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Oxided	120173	121.50
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Oxided	120184	93.10
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Bright	120195	93.10
25Pc. • 1.0mm - 13.0mm by 0.5mm • 118° Point • Oxided	120203	212.62
26Pc. • A-Z • 118° Point • Oxided	120217	155.82
26Pc. • A-Z • 118° Point • Bright	120228	155.82
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Oxided	120239	151.38
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Bright	120250	151.38
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Oxided	120272	188.41
29Pc. • 1/16" - 1/2" by 64ths • 3/8" Reduced Shank • 118° Point • Oxided	120283	161.31
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • TIN Coated	120294	374.37
60Pc. • #1 - #60 • 118° Point • Oxided	120305	136.93
60Pc. • #1 - #60 • 118° Point • Bright	120316	136.93
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Oxided	120327	435.10
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Bright	120338	435.10

## 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	49.21
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Black/Gold	120151	142.53
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120206	139.60
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120261	228.04
29Pc. • 1/16" - 1/2" by 64ths • H.D. • 135° SP/PT • Black/Gold • Plastic Case	120569	228.04
115Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120349	629.00

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.  
FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

145

DRILLS



**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	53.18
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Straw Finish	120371	179.45
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120382	195.46
26Pc. • A - Z • Heavy Duty • 135° SP/PT • Straw Finish	120393	297.63
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120404	291.31
60Pc. • #1 - #60 • Heavy Duty • 135° SP/PT • Straw Finish	120415	254.27
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT • Straw Finish	120426	1,072.37

**DRILL INDEXES ONLY**

DESCRIPTION	ITEM#	LIST PRICE
21Pc. • 1/16" - 3/8" by 64ths • Metal Case	120492	14.45
26Pc. • A - Z • Metal Case	120503	15.57
29Pc. • 1/16" - 1/2" by 64ths • Metal Case	120514	15.57
60Pc. • #1 - #60 • Metal Case	120525	15.46
115Pc. • 1/16" - 1/2" by 64ths, A - Z, #1 - #60 • Metal Case	120536	95.52

**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	202.97

**NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.**



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

**SILVER & DEMING SETS - 1/2" SHANK**

DESCRIPTION	ITEM#	LIST PRICE
8Pc. • HSS • 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1" • 118° Point • In Plastic Case	120448	367.90
8Pc. • HSS • Black & Gold • 118° Split Point • In Plastic Case	120481	467.22
8Pc. • M42 Cobalt • 118° Split Point • In Plastic Case	120470	759.00
33Pc. • HSS • 1/2" - 1" by 64ths • 118° Point • Metal Stand	120459	1,655.13



**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	134.15
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Metal Case	120547	247.55
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Plastic Case	120580	247.55

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

**FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.**

## JOBBER LENGTH - 118° POINT



**BRIGHT 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	7/8	1-7/8	12	106313	1.60	7/32	2-1/2	3-3/4	12	106423	2.59	3/8	3-5/8	5	6	106533	7.16
5/64	1	2	12	106324	1.60	15/64	2-5/8	3-7/8	12	106434	2.90	25/64	3-3/4	5-1/8	6	106544	7.74
3/32	1-1/4	2-1/4	12	106335	1.60	1/4	2-3/4	4	12	106445	2.97	13/32	3-7/8	5-1/4	6	106555	8.45
7/64	1-1/2	2-5/8	12	106346	1.60	17/64	2-7/8	4-1/8	6	106456	4.26	27/64	3-15/16	5-3/8	6	106566	9.00
1/8	1-5/8	2-3/4	12	106357	1.60	9/32	2-15/16	4-1/4	6	106467	4.53	7/16	4-1/16	5-1/2	6	106577	9.82
9/64	1-3/4	2-7/8	12	106368	1.70	19/64	3-1/16	4-3/8	6	106478	4.98	29/64	4-3/16	5-5/8	6	106588	10.46
5/32	2	3-1/8	12	106379	1.77	5/16	3-3/16	4-1/2	6	106489	5.18	15/32	4-5/16	5-3/4	6	106599	11.38
11/64	2-1/8	3-1/4	12	106390	1.91	21/64	3-5/16	4-5/8	6	106500	5.79	31/64	4-3/8	5-7/8	6	106610	12.03
3/16	2-5/16	3-1/2	12	106401	2.08	11/32	3-7/16	4-3/4	6	106511	6.20	1/2	4-1/2	6	6	106621	12.54
13/64	2-7/16	3-5/8	12	106412	2.35	23/64	3-1/2	4-7/8	6	106522	6.82	-	-	-	-	-	-

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	107512	2.90	J	2-7/8	4-1/8	6	107611	4.43	S	3-1/2	4-7/8	6	107710	6.82
B	2-3/4	4	12	107523	2.97	K	2-15/16	4-1/4	6	107622	4.53	T	3-1/2	4-7/8	6	107721	7.16
C	2-3/4	4	12	107534	2.97	L	2-15/16	4-1/4	6	107633	4.74	U	3-5/8	5	6	107732	7.74
D	2-3/4	4	12	107545	3.07	M	3-1/16	4-3/8	6	107644	5.01	V	3-5/8	5	6	107743	8.01
E	2-3/4	4	12	107556	3.10	N	3-1/16	4-3/8	6	107655	5.18	W	3-3/4	5-1/8	6	107754	8.52
F	2-7/8	4-1/8	6	107567	4.29	O	3-3/16	4-1/2	6	107666	5.62	X	3-3/4	5-1/8	6	107765	9.03
G	2-7/8	4-1/8	6	107578	4.12	P	3-5/16	4-5/8	6	107677	6.03	Y	3-7/8	5-1/4	6	107776	9.48
H	2-7/8	4-1/8	6	107589	4.19	Q	3-7/16	4-3/4	6	107688	6.27	Z	3-7/8	5-1/4	6	107787	9.68
I	2-7/8	4-1/8	6	107600	4.29	R	3-7/16	4-3/4	6	107699	6.51	-	-	-	-	-	-

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	106632	3.17	21	2-1/8	3-1/4	12	106852	2.01	41	1-3/8	2-3/8	12	107072	1.47
2	2-5/8	3-7/8	12	106643	3.17	22	2	3-1/8	12	106863	1.91	42	1-1/4	2-1/4	12	107083	1.47
3	2-1/2	3-3/4	12	106654	2.90	23	2	3-1/8	12	106874	1.91	43	1-1/4	2-1/4	12	107094	1.47
4	2-1/2	3-3/4	12	106665	2.90	24	2	3-1/8	12	106885	1.91	44	1-1/8	2-1/8	12	107105	1.47
5	2-1/2	3-3/4	12	106676	2.86	25	1-7/8	3	12	106896	1.67	45	1-1/8	2-1/8	12	107116	1.53
6	2-1/2	3-3/4	12	106687	2.86	26	1-7/8	3	12	106907	1.67	46	1-1/8	2-1/8	12	107127	1.53
7	2-7/16	3-5/8	12	106698	2.76	27	1-7/8	3	12	106918	1.67	47	1	2	12	107138	1.53
8	2-7/16	3-5/8	12	106709	2.76	28	1-3/4	2-7/8	12	106929	1.53	48	1	2	12	107149	1.53
9	2-7/16	3-5/8	12	106720	2.73	29	1-3/4	2-7/8	12	106940	1.53	49	1	2	12	107160	1.53
10	2-7/16	3-5/8	12	106731	2.49	30	1-5/8	2-3/4	12	106951	1.50	50	1	2	12	107171	1.53
11	2-5/16	3-1/2	12	106742	2.49	31	1-5/8	2-3/4	12	106962	1.47	51	1	2	12	107182	1.53
12	2-5/16	3-1/2	12	106753	2.49	32	1-5/8	2-3/4	12	106973	1.47	52	7/8	1-7/8	12	107193	1.53
13	2-5/16	3-1/2	12	106764	2.49	33	1-1/2	2-5/8	12	106984	1.47	53	7/8	1-7/8	12	107204	1.53
14	2-3/16	3-3/8	12	106775	2.35	34	1-1/2	2-5/8	12	106995	1.47	54	7/8	1-7/8	12	107215	1.64
15	2-3/16	3-3/8	12	106786	2.35	35	1-1/2	2-5/8	12	107006	1.47	55	7/8	1-7/8	12	107226	1.64
16	2-3/16	3-3/8	12	106797	2.35	36	1-7/16	2-1/2	12	107017	1.47	56	3/4	1-3/4	12	107237	1.64
17	2-3/16	3-3/8	12	106808	2.25	37	1-7/16	2-1/2	12	107028	1.47	57	3/4	1-3/4	12	107248	1.81
18	2-1/8	3-1/4	12	106819	2.25	38	1-7/16	2-1/2	12	107039	1.47	58	11/16	1-5/8	12	107259	1.81
19	2-1/8	3-1/4	12	106830	2.25	39	1-3/8	2-3/8	12	107050	1.47	59	11/16	1-5/8	12	107270	1.81
20	2-1/8	3-1/4	12	106841	2.01	40	1-3/8	2-3/8	12	107061	1.47	60	11/16	1-5/8	12	107281	1.81

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.



# HSS Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## JOBBER LENGTH - 118° POINT



TIN COATED

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
1/16	7/8	1-7/8	12	110647	4.53	7/32	2-1/2	3-3/4	12	110757	8.40	3/8	3-5/8	5	6	110867	20.92
5/64	1	2	12	110658	4.53	15/64	2-5/8	3-7/8	12	110768	8.76	25/64	3-3/4	5-1/8	6	110878	25.89
3/32	1-1/4	2-1/4	12	110669	4.53	1/4	2-3/4	4	12	110779	8.98	13/32	3-7/8	5-1/4	6	110889	26.48
7/64	1-1/2	2-5/8	12	110680	4.60	17/64	2-7/8	4-1/8	6	110790	12.78	27/64	3-15/16	5-3/8	6	110900	27.40
1/8	1-5/8	2-3/4	12	110691	4.60	9/32	2-15/16	4-1/4	6	110801	14.18	7/16	4-1/16	5-1/2	6	110911	27.99
9/64	1-3/4	2-7/8	12	110702	4.82	19/64	3-1/16	4-3/8	6	110812	14.47	29/64	4-3/16	5-5/8	6	110922	30.75
5/32	2	3-1/8	12	110713	5.38	5/16	3-3/16	4-1/2	6	110823	15.28	15/32	4-5/16	5-3/4	6	110933	31.63
11/64	2-1/8	3-1/4	12	110724	5.45	21/64	3-5/16	4-5/8	6	110834	17.42	31/64	4-3/8	5-7/8	6	110944	31.89
3/16	2-5/16	3-1/2	12	110735	5.74	11/32	3-7/16	4-3/4	6	110845	18.34	1/2	4-1/2	6	6	110955	32.55
13/64	2-7/16	3-5/8	12	110746	8.17	23/64	3-1/2	4-7/8	6	110856	20.69	-	-	-	-	-	-

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	9.13	J	2-7/8	4-1/8	6	111065	15.54	S	3-1/2	4-7/8	6	111164	23.35
B	2-3/4	4	12	110977	9.35	K	2-15/16	4-1/4	6	111076	16.72	T	3-1/2	4-7/8	6	111175	24.45
C	2-3/4	4	12	110988	9.35	L	2-15/16	4-1/4	6	111087	16.72	U	3-5/8	5	6	111186	24.45
D	2-3/4	4	12	110999	9.35	M	3-1/16	4-3/8	6	111098	17.01	V	3-5/8	5	6	111197	24.78
E	2-3/4	4	12	111010	8.98	N	3-1/16	4-3/8	6	111109	17.31	W	3-3/4	5-1/8	6	111208	28.69
F	2-7/8	4-1/8	6	111021	15.43	O	3-3/16	4-1/2	6	111120	17.31	X	3-3/4	5-1/8	6	111219	30.89
G	2-7/8	4-1/8	6	111032	15.43	P	3-5/16	4-5/8	6	111131	18.04	Y	3-7/8	5-1/4	6	111230	32.92
H	2-7/8	4-1/8	6	111043	15.43	Q	3-7/16	4-3/4	6	111142	18.04	Z	3-7/8	5-1/4	6	111241	33.29
I	2-7/8	4-1/8	6	111054	15.43	R	3-7/16	4-3/4	6	111153	18.52	-	-	-	-	-	-

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	2-5/8	3-7/8	12	111252	9.13	21	2-1/8	3-1/4	12	111472	5.89	41	1-3/8	2-3/8	12	111692	4.53
2	2-5/8	3-7/8	12	111263	9.13	22	2	3-1/8	12	111483	5.89	42	1-1/4	2-1/4	12	111703	4.53
3	2-1/2	3-3/4	12	111274	8.76	23	2	3-1/8	12	111494	5.82	43	1-1/4	2-1/4	12	111714	4.53
4	2-1/2	3-3/4	12	111285	8.76	24	2	3-1/8	12	111505	5.82	44	1-1/8	2-1/8	12	111725	4.53
5	2-1/2	3-3/4	12	111296	8.76	25	1-7/8	3	12	111516	5.71	45	1-1/8	2-1/8	12	111736	4.53
6	2-1/2	3-3/4	12	111307	8.76	26	1-7/8	3	12	111527	5.71	46	1-1/8	2-1/8	12	111747	4.53
7	2-7/16	3-5/8	12	111318	8.32	27	1-7/8	3	12	111538	5.71	47	1	2	12	111758	4.53
8	2-7/16	3-5/8	12	111329	8.32	28	1-3/4	2-7/8	12	111549	5.52	48	1	2	12	111769	4.53
9	2-7/16	3-5/8	12	111340	8.32	29	1-3/4	2-7/8	12	111560	5.52	49	1	2	12	111780	4.53
10	2-7/16	3-5/8	12	111351	8.32	30	1-5/8	2-3/4	12	111571	4.60	50	1	2	12	111791	4.53
11	2-5/16	3-1/2	12	111362	8.32	31	1-5/8	2-3/4	12	111582	4.60	51	1	2	12	111802	4.53
12	2-5/16	3-1/2	12	111373	6.81	32	1-5/8	2-3/4	12	111593	4.60	52	7/8	1-7/8	12	111813	4.53
13	2-5/16	3-1/2	12	111384	6.70	33	1-1/2	2-5/8	12	111604	4.60	53	7/8	1-7/8	12	111824	4.53
14	2-3/16	3-3/8	12	111395	6.70	34	1-1/2	2-5/8	12	111615	4.60	54	7/8	1-7/8	12	111835	4.53
15	2-3/16	3-3/8	12	111406	6.70	35	1-1/2	2-5/8	12	111626	4.60	55	7/8	1-7/8	12	111846	4.53
16	2-3/16	3-3/8	12	111417	6.70	36	1-7/16	2-1/2	12	111637	4.53	56	3/4	1-3/4	12	111857	4.53
17	2-3/16	3-3/8	12	111428	6.70	37	1-7/16	2-1/2	12	111648	4.53	57	3/4	1-3/4	12	111868	4.53
18	2-1/8	3-1/4	12	111439	5.97	38	1-7/16	2-1/2	12	111659	4.53	58	11/16	1-5/8	12	111879	4.53
19	2-1/8	3-1/4	12	111450	5.97	39	1-3/8	2-3/8	12	111670	4.53	59	11/16	1-5/8	12	111890	4.53
20	2-1/8	3-1/4	12	111461	5.97	40	1-3/8	2-3/8	12	111681	4.53	60	11/16	1-5/8	12	111901	4.53

FOR COATING INFORMATION SEE PAGE 5.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

## JOBBER LENGTH - 118° POINT



OXIDE FINISH

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
1/16	7/8	1-7/8	12	104663	1.60	9/32	2-15/16	4-1/4	6	104817	4.53	1/2	4-1/2	6	6	104971	12.54
5/64	1	2	12	104674	1.60	19/64	3-1/16	4-3/8	6	104828	4.98	33/64	4-13/16	6-5/8	1	104982	29.96
3/32	1-1/4	2-1/4	12	104685	1.60	5/16	3-3/16	4-1/2	6	104839	5.18	17/32	4-13/16	6-5/8	1	104993	31.39
7/64	1-1/2	2-5/8	12	104696	1.60	21/64	3-5/16	4-5/8	6	104850	5.79	35/64	4-13/16	6-5/8	1	105004	33.98
1/8	1-5/8	2-3/4	12	104707	1.60	11/32	3-7/16	4-3/4	6	104861	6.20	9/16	4-13/16	6-5/8	1	105015	35.58
9/64	1-3/4	2-7/8	12	104718	1.70	23/64	3-1/2	4-7/8	6	104872	6.82	37/64	4-13/16	6-5/8	1	105026	35.69
5/32	2	3-1/8	12	104729	1.77	3/8	3-5/8	5	6	104883	7.16	19/32	5-3/16	7-1/8	1	105037	36.67
11/64	2-1/8	3-1/4	12	104740	1.91	25/64	3-3/4	5-1/8	6	104894	7.74	39/64	5-3/16	7-1/8	1	105048	40.29
3/16	2-5/16	3-1/2	12	104751	2.08	13/32	3-7/8	5-1/4	6	104905	8.45	5/8	5-3/16	7-1/8	1	105059	39.33
13/64	2-7/16	3-5/8	12	104762	2.35	27/64	3-15/16	5-3/8	6	104916	9.00	41/64	5-3/16	7-1/8	1	105070	43.01
7/32	2-1/2	3-3/4	12	104773	2.59	7/16	4-1/16	5-1/2	6	104927	9.82	21/32	5-3/16	7-1/8	1	105081	41.55
15/64	2-5/8	3-7/8	12	104784	2.90	29/64	4-3/16	5-5/8	6	104938	10.46	43/64	5-5/8	7-5/8	1	105092	48.84
1/4	2-3/4	4	12	104795	2.97	15/32	4-5/16	5-3/4	6	104949	11.38	11/16	5-5/8	7-5/8	1	105103	47.79
17/64	2-7/8	4-1/8	6	104806	4.26	31/64	4-3/8	5-7/8	6	104960	12.03	-	-	-	-	-	-

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	105994	2.90	J	2-7/8	4-1/8	6	106093	4.43	S	3-1/2	4-7/8	6	106192	6.82
B	2-3/4	4	12	106005	2.97	K	2-15/16	4-1/4	6	106104	4.53	T	3-1/2	4-7/8	6	106203	7.16
C	2-3/4	4	12	106016	2.97	L	2-15/16	4-1/4	6	106115	4.74	U	3-5/8	5	6	106214	7.74
D	2-3/4	4	12	106027	3.07	M	3-1/16	4-3/8	6	106126	5.01	V	3-5/8	5	6	106225	8.01
E	2-3/4	4	12	106038	3.10	N	3-1/16	4-3/8	6	106137	5.18	W	3-3/4	5-1/8	6	106236	8.52
F	2-7/8	4-1/8	6	106049	4.29	O	3-3/16	4-1/2	6	106148	5.62	X	3-3/4	5-1/8	6	106247	9.03
G	2-7/8	4-1/8	6	106060	4.12	P	3-5/16	4-5/8	6	106159	6.03	Y	3-7/8	5-1/4	6	106258	9.48
H	2-7/8	4-1/8	6	106071	4.19	Q	3-7/16	4-3/4	6	106170	6.27	Z	3-7/8	5-1/4	6	106269	9.68
I	2-7/8	4-1/8	6	106082	4.29	R	3-7/16	4-3/4	6	106181	6.51	-	-	-	-	-	-

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	105114	3.17	21	2-1/8	3-1/4	12	105334	2.01	41	1-3/8	2-3/8	12	105554	1.47
2	2-5/8	3-7/8	12	105125	3.17	22	2	3-1/8	12	105345	1.94	42	1-1/4	2-1/4	12	105565	1.47
3	2-1/2	3-3/4	12	105136	2.90	23	2	3-1/8	12	105356	1.94	43	1-1/4	2-1/4	12	105576	1.47
4	2-1/2	3-3/4	12	105147	2.90	24	2	3-1/8	12	105367	1.94	44	1-1/8	2-1/8	12	105587	1.47
5	2-1/2	3-3/4	12	105158	2.86	25	1-7/8	3	12	105378	1.67	45	1-1/8	2-1/8	12	105598	1.53
6	2-1/2	3-3/4	12	105169	2.86	26	1-7/8	3	12	105389	1.67	46	1-1/8	2-1/8	12	105609	1.53
7	2-7/16	3-5/8	12	105180	2.76	27	1-7/8	3	12	105400	1.67	47	1	2	12	105620	1.53
8	2-7/16	3-5/8	12	105191	2.76	28	1-3/4	2-7/8	12	105411	1.53	48	1	2	12	105631	1.53
9	2-7/16	3-5/8	12	105202	2.73	29	1-3/4	2-7/8	12	105422	1.53	49	1	2	12	105642	1.53
10	2-7/16	3-5/8	12	105213	2.49	30	1-5/8	2-3/4	12	105433	1.50	50	1	2	12	105653	1.53
11	2-5/16	3-1/2	12	105224	2.49	31	1-5/8	2-3/4	12	105444	1.47	51	1	2	12	105664	1.53
12	2-5/16	3-1/2	12	105235	2.49	32	1-5/8	2-3/4	12	105455	1.47	52	7/8	1-7/8	12	105675	1.53
13	2-5/16	3-1/2	12	105246	2.49	33	1-1/2	2-5/8	12	105466	1.47	53	7/8	1-7/8	12	105686	1.53
14	2-3/16	3-3/8	12	105257	2.35	34	1-1/2	2-5/8	12	105477	1.47	54	7/8	1-7/8	12	105697	1.64
15	2-3/16	3-3/8	12	105268	2.35	35	1-1/2	2-5/8	12	105488	1.47	55	7/8	1-7/8	12	105708	1.64
16	2-3/16	3-3/8	12	105279	2.35	36	1-7/16	2-1/2	12	105499	1.47	56	3/4	1-3/4	12	105719	1.64
17	2-3/16	3-3/8	12	105290	2.25	37	1-7/16	2-1/2	12	105510	1.47	57	3/4	1-3/4	12	105730	1.81
18	2-1/8	3-1/4	12	105301	2.25	38	1-7/16	2-1/2	12	105521	1.47	58	11/16	1-5/8	12	105741	1.81
19	2-1/8	3-1/4	12	105312	2.25	39	1-3/8	2-3/8	12	105532	1.47	59	11/16	1-5/8	12	105752	1.81
20	2-1/8	3-1/4	12	105323	2.01	40	1-3/8	2-3/8	12	105543	1.47	60	11/16	1-5/8	12	105763	1.81

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

## JOBBER LENGTH - 118° POINT



OXIDE FINISH

METRIC SIZES					
SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1.00	17	41	12	215037	2.10
1.05	17	41	12	215048	2.31
1.10	19	44	12	215059	2.20
1.15	19	44	12	215070	2.24
1.20	22	48	12	215081	2.20
1.25	22	48	12	215092	2.24
1.30	22	48	12	215103	2.20
1.35	22	48	12	215114	2.31
1.40	22	48	12	215125	2.20
1.50	22	48	12	215147	2.20
1.60	22	48	12	215169	2.20
1.70	25	51	12	215191	2.24
1.80	25	51	12	215213	2.24
1.90	25	51	12	215235	2.24
2.00	25	51	12	215257	2.24
2.50	35	60	12	215367	2.35
3.00	41	70	12	215422	2.46
3.50	45	73	12	215477	2.57
4.00	54	83	12	215532	2.67
4.50	56	86	12	215587	3.00
5.00	62	92	12	215642	3.40
5.50	64	95	12	215697	3.83
6.00	70	102	12	215752	4.15
6.50	73	105	6	215807	5.31
7.00	73	105	6	215862	5.53
7.50	78	111	6	215917	6.58
8.00	81	114	6	215972	7.23
8.50	87	121	6	216027	8.27
9.00	89	124	6	216082	9.32
9.50	92	127	6	216137	9.75
10.00	95	130	6	216192	10.48
10.50	98	133	6	216214	11.92
11.00	103	140	6	216225	12.25
11.50	106	143	6	216247	13.77
12.00	111	149	6	216258	15.17
12.50	114	152	6	216269	15.50
13.00	114	152	6	216280	25.69

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

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



OXIDE FINISH

DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	107798	1.60
5/64	1	2	12	107809	1.60
3/32	1-1/4	2-1/4	12	107820	1.60
7/64	1-1/2	2-5/8	12	107831	1.60
1/8	1-5/8	2-3/4	12	107842	1.60
9/64	1-3/4	2-7/8	12	107853	1.74
5/32	2	3-1/8	12	107864	2.11
11/64	2-1/8	3-1/4	12	107875	2.25
3/16	2-5/16	3-1/2	12	107886	2.56
13/64	2-7/16	3-5/8	12	107897	2.76

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
7/32	2-1/2	3-3/4	12	107908	3.03
15/64	2-5/8	3-7/8	12	107919	3.31
1/4	2-3/4	4	12	107930	3.51
17/64	2-7/8	4-1/8	6	107941	4.84
9/32	2-15/16	4-1/4	6	107952	5.25
19/64	3-1/16	4-3/8	6	107963	5.79
5/16	3-3/16	4-1/2	6	107974	5.96
21/64	3-5/16	4-5/8	6	107985	6.75
11/32	3-7/16	4-3/4	6	107996	7.16
23/64	3-1/2	4-7/8	6	108007	7.53

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/8	3-5/8	5	6	108018	8.21
25/64	3-3/4	5-1/8	6	108029	8.93
13/32	3-7/8	5-1/4	6	108040	9.68
27/64	3-15/16	5-3/8	6	108051	10.43
7/16	4-1/16	5-1/2	6	108062	11.32
29/64	4-3/16	5-5/8	6	108073	12.07
15/32	4-5/16	5-3/4	6	108084	13.12
31/64	4-3/8	5-7/8	6	108095	13.87
1/2	4-1/2	6	6	108106	14.59
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	108777	3.78
B	2-3/4	4	12	108788	3.78
C	2-3/4	4	12	108799	3.78
D	2-3/4	4	12	108810	3.78
E	2-3/4	4	12	108821	3.78
F	2-7/8	4-1/8	6	108832	4.81
G	2-7/8	4-1/8	6	108843	4.81
H	2-7/8	4-1/8	6	108854	4.81
I	2-7/8	4-1/8	6	108865	4.81

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	108876	5.83
K	2-15/16	4-1/4	6	108887	5.83
L	2-15/16	4-1/4	6	108898	5.83
M	3-1/16	4-3/8	6	108909	7.16
N	3-1/16	4-3/8	6	108920	7.16
O	3-3/16	4-1/2	6	108931	7.16
P	3-5/16	4-5/8	6	108942	8.08
Q	3-7/16	4-3/4	6	108953	8.08
R	3-7/16	4-3/4	6	108964	8.08

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	108975	9.20
T	3-1/2	4-7/8	6	108986	9.20
U	3-5/8	5	6	108997	9.78
V	3-5/8	5	6	109008	9.78
W	3-3/4	5-1/8	6	109019	11.11
X	3-3/4	5-1/8	6	109030	11.11
Y	3-7/8	5-1/4	6	109041	12.10
Z	3-7/8	5-1/4	6	109052	12.10
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	108117	3.27
2	2-5/8	3-7/8	12	108128	3.27
3	2-1/2	3-3/4	12	108139	3.03
4	2-1/2	3-3/4	12	108150	3.03
5	2-1/2	3-3/4	12	108161	3.03
6	2-1/2	3-3/4	12	108172	3.03
7	2-7/16	3-5/8	12	108183	2.86
8	2-7/16	3-5/8	12	108194	2.90
9	2-7/16	3-5/8	12	108205	2.90
10	2-7/16	3-5/8	12	108216	2.62
11	2-5/16	3-1/2	12	108227	2.62
12	2-5/16	3-1/2	12	108238	2.62
13	2-5/16	3-1/2	12	108249	2.90
14	2-3/16	3-3/8	12	108260	2.90
15	2-3/16	3-3/8	12	108271	2.90
16	2-3/16	3-3/8	12	108282	2.90
17	2-3/16	3-3/8	12	108293	2.90
18	2-1/8	3-1/4	12	108304	2.90
19	2-1/8	3-1/4	12	108315	2.76
20	2-1/8	3-1/4	12	108326	2.76

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
21	2-1/8	3-1/4	12	108337	2.59
22	2	3-1/8	12	108348	2.59
23	2	3-1/8	12	108359	2.59
24	2	3-1/8	12	108370	2.59
25	1-7/8	3	12	108381	2.59
26	1-7/8	3	12	108392	2.59
27	1-7/8	3	12	108403	2.59
28	1-3/4	2-7/8	12	108414	2.59
29	1-3/4	2-7/8	12	108425	2.08
30	1-5/8	2-3/4	12	108436	2.08
31	1-5/8	2-3/4	12	108447	2.28
32	1-5/8	2-3/4	12	108458	2.28
33	1-1/2	2-5/8	12	108469	2.28
34	1-1/2	2-5/8	12	108480	2.28
35	1-1/2	2-5/8	12	108491	2.28
36	1-7/16	2-1/2	12	108502	2.28
37	1-7/16	2-1/2	12	108513	2.28
38	1-7/16	2-1/2	12	108524	2.28
39	1-3/8	2-3/8	12	108535	2.28
40	1-3/8	2-3/8	12	108546	2.28

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
41	1-3/8	2-3/8	12	108557	2.18
42	1-1/4	2-1/4	12	108568	2.18
43	1-1/4	2-1/4	12	108579	2.18
44	1-1/8	2-1/8	12	108590	2.18
45	1-1/8	2-1/8	12	108601	2.18
46	1-1/8	2-1/8	12	108612	2.18
47	1	2	12	108623	2.18
48	1	2	12	108634	2.18
49	1	2	12	108645	2.18
50	1	2	12	108656	2.18
51	1	2	12	108667	2.18
52	7/8	1-7/8	12	108678	2.18
53	7/8	1-7/8	12	108689	2.18
54	7/8	1-7/8	12	108700	2.18
55	7/8	1-7/8	12	108711	2.18
56	3/4	1-3/4	12	108722	2.18
57	3/4	1-3/4	12	108733	2.18
58	11/16	1-5/8	12	108744	2.18
59	11/16	1-5/8	12	108755	2.18
60	11/16	1-5/8	12	108766	2.18

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

# HSS Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



BLACK & GOLD

DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	109063	1.84
5/64	1	2	12	109074	2.01
3/32	1-1/4	2-1/4	12	109085	1.84
7/64	1-1/2	2-5/8	12	109096	1.91
1/8	1-5/8	2-3/4	12	109107	2.11
9/64	1-3/4	2-7/8	12	109118	2.22
5/32	2	3-1/8	12	109129	2.66
11/64	2-1/8	3-1/4	12	109140	2.79
3/16	2-5/16	3-1/2	12	109151	3.10
13/64	2-7/16	3-5/8	12	109162	3.37

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
7/32	2-1/2	3-3/4	12	109173	3.68
15/64	2-5/8	3-7/8	12	109184	4.06
1/4	2-3/4	4	12	109195	4.26
17/64	2-7/8	4-1/8	6	109206	5.73
9/32	2-15/16	4-1/4	6	109217	6.17
19/64	3-1/16	4-3/8	6	109228	6.78
5/16	3-3/16	4-1/2	6	109239	7.02
21/64	3-5/16	4-5/8	6	109250	7.74
11/32	3-7/16	4-3/4	6	109261	8.28
23/64	3-1/2	4-7/8	6	109272	8.96

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/8	3-5/8	5	6	109283	9.37
25/64	3-3/4	5-1/8	6	109294	10.19
13/32	3-7/8	5-1/4	6	109305	11.21
27/64	3-15/16	5-3/8	6	109316	11.96
7/16	4-1/16	5-1/2	6	109327	12.88
29/64	4-3/16	5-5/8	6	109338	13.70
15/32	4-5/16	5-3/4	6	109349	14.89
31/64	4-3/8	5-7/8	6	109360	15.71
1/2	4-1/2	6	6	109371	16.43
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	110042	5.97
B	2-3/4	4	12	110053	5.97
C	2-3/4	4	12	110064	5.97
D	2-3/4	4	12	110075	5.78
E	2-3/4	4	12	110086	4.82
F	2-7/8	4-1/8	6	110097	6.46
G	2-7/8	4-1/8	6	110108	6.99
H	2-7/8	4-1/8	6	110119	7.13
I	2-7/8	4-1/8	6	110130	7.13

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	110141	7.56
K	2-15/16	4-1/4	6	110152	8.43
L	2-15/16	4-1/4	6	110163	8.14
M	3-1/16	4-3/8	6	110174	8.96
N	3-1/16	4-3/8	6	110185	8.96
O	3-3/16	4-1/2	6	110196	8.96
P	3-5/16	4-5/8	6	110207	10.02
Q	3-7/16	4-3/4	6	110218	10.31
R	3-7/16	4-3/4	6	110229	10.74

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	110240	11.61
T	3-1/2	4-7/8	6	110251	13.06
U	3-5/8	5	6	110262	13.06
V	3-5/8	5	6	110273	13.30
W	3-3/4	5-1/8	6	110284	16.28
X	3-3/4	5-1/8	6	110295	19.22
Y	3-7/8	5-1/4	6	110306	19.46
Z	3-7/8	5-1/4	6	110317	19.90
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	109382	5.54
2	2-5/8	3-7/8	12	109393	5.54
3	2-1/2	3-3/4	12	109404	5.15
4	2-1/2	3-3/4	12	109415	5.15
5	2-1/2	3-3/4	12	109426	5.15
6	2-1/2	3-3/4	12	109437	5.15
7	2-7/16	3-5/8	12	109448	4.53
8	2-7/16	3-5/8	12	109459	4.53
9	2-7/16	3-5/8	12	109470	4.53
10	2-7/16	3-5/8	12	109481	4.43
11	2-5/16	3-1/2	12	109492	4.09
12	2-5/16	3-1/2	12	109503	4.09
13	2-5/16	3-1/2	12	109514	3.95
14	2-3/16	3-3/8	12	109525	3.95
15	2-3/16	3-3/8	12	109536	3.95
16	2-3/16	3-3/8	12	109547	3.95
17	2-3/16	3-3/8	12	109558	3.95
18	2-1/8	3-1/4	12	109569	3.47
19	2-1/8	3-1/4	12	109580	3.47
20	2-1/8	3-1/4	12	109591	3.47

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
21	2-1/8	3-1/4	12	109602	3.44
22	2	3-1/8	12	109613	3.44
23	2	3-1/8	12	109624	3.34
24	2	3-1/8	12	109635	3.34
25	1-7/8	3	12	109646	3.34
26	1-7/8	3	12	109657	3.34
27	1-7/8	3	12	109668	3.24
28	1-3/4	2-7/8	12	109679	3.24
29	1-3/4	2-7/8	12	109690	3.17
30	1-5/8	2-3/4	12	109701	2.76
31	1-5/8	2-3/4	12	109712	2.76
32	1-5/8	2-3/4	12	109723	2.76
33	1-1/2	2-5/8	12	109734	2.76
34	1-1/2	2-5/8	12	109745	2.76
35	1-1/2	2-5/8	12	109756	2.76
36	1-7/16	2-1/2	12	109767	2.66
37	1-7/16	2-1/2	12	109778	2.66
38	1-7/16	2-1/2	12	109789	2.66
39	1-3/8	2-3/8	12	109800	2.66
40	1-3/8	2-3/8	12	109811	2.66

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
41	1-3/8	2-3/8	12	109822	2.66
42	1-1/4	2-1/4	12	109833	2.66
43	1-1/4	2-1/4	12	109844	2.66
44	1-1/8	2-1/8	12	109855	2.66
45	1-1/8	2-1/8	12	109866	2.66
46	1-1/8	2-1/8	12	109877	2.66
47	1	2	12	109888	2.66
48	1	2	12	109899	2.66
49	1	2	12	109910	2.66
50	1	2	12	109921	2.66
51	1	2	12	109932	2.66
52	7/8	1-7/8	12	109943	2.49
53	7/8	1-7/8	12	109954	2.49
54	7/8	1-7/8	12	109965	2.49
55	7/8	1-7/8	12	109976	2.49
56	3/4	1-3/4	12	109987	2.49
57	3/4	1-3/4	12	109998	2.49
58	11/16	1-5/8	12	110009	2.49
59	11/16	1-5/8	12	110020	2.49
60	11/16	1-5/8	12	110031	2.49

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

153



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



**BLACK & GOLD**

DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	OVERALL LENGTH	PACKAGE QUANTITY	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	110328	2.18
5/64	1	2	12	110339	2.35
3/32	1-1/4	2-1/4	12	110350	2.35
7/64	1-5/16	2-3/8	12	110361	2.42
1/8	1-7/16	2-1/2	12	110372	2.52
9/64	1-9/16	2-5/8	12	110383	2.59
5/32	1-11/16	2-3/4	12	110394	3.10
11/64	1-13/16	2-7/8	12	110405	3.17
3/16	1-7/8	3	12	110416	3.61
13/64	1-15/16	3-1/8	12	110427	3.92
7/32	2	3-1/4	12	110438	4.36
15/64	2-1/16	3-3/8	12	110449	4.67
1/4	2	3-1/2	12	110460	4.94
17/64	2-1/8	3-5/8	6	110471	6.20
9/32	2-1/4	3-3/4	6	110482	6.20
19/64	2-3/8	3-7/8	6	110493	7.36
5/16	2-1/2	4	6	110504	7.87
21/64	2-9/16	4-1/16	6	110515	8.38
11/32	2-5/8	4-1/8	6	110526	9.13
23/64	2-11/16	4-3/16	6	110537	9.71
3/8	2-11/16	4-1/4	6	110548	10.29
25/64	2-3/4	4-5/16	6	110559	10.94
13/32	2-13/16	4-3/8	6	110570	11.79
27/64	2-7/8	4-7/16	6	110581	13.29
7/16	2-15/16	4-1/2	6	110592	14.04
29/64	3	4-5/8	6	110603	15.30
15/32	3-1/8	4-3/4	6	110614	16.39
31/64	3-1/4	4-7/8	6	110625	16.74
1/2	3-3/8	5	6	110636	17.18

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

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

# HSS Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



OXIDE FINISH

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	
1/16	5/8	1-5/8	12	102100	1.87	7/32	1-1/4	2-3/8	12	102210	2.83	3/8	1-13/16	3-1/8	6	102320	6.27	
5/64	11/16	1-11/16	12	102111	1.91	15/64	1-5/16	2-7/16	12	102221	3.27	25/64	1-7/8	3-1/4	6	102331	6.65	
3/32	3/4	1-3/4	12	102122	1.91	1/4	1-3/8	2-1/2	12	102232	3.61	13/32	1-15/16	3-5/16	6	102342	7.29	
7/64	13/16	1-13/16	12	102133	1.91	17/64	1-7/16	2-5/8	6	102243	3.72	27/64	2	3-3/8	6	102353	7.70	
1/8	7/8	1-7/8	12	102144	1.91	9/32	1-1/2	2-11/16	6	102254	3.92	7/16	1-1/16	3-7/16	6	102364	8.42	
9/64	15/16	1-15/16	12	102155	1.91	19/64	1-9/16	2-3/4	6	102265	4.26	29/64	2-1/8	3-9/16	6	102375	8.93	
5/32	1	2-1/16	12	102166	2.08	5/16	1-5/8	2-13/16	6	102276	4.53	15/32	2-1/8	3-5/8	6	102386	9.82	
11/64	1-1/16	2-1/8	12	102177	2.08	21/64	1-11/16	2-15/16	6	102287	5.08	31/64	2-3/16	3-11/16	6	102397	10.19	
3/16	1-1/8	2-3/16	12	102188	2.42	11/32	1-1/16	3	6	102298	5.42	1/2	2-1/4	3-3/4	6	102408	10.74	
13/64	1-3/16	2-1/4	12	102199	2.49	23/64	1-3/4	3-1/16	6	102309	5.76	-	-	-	-	-	-	-

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	3.92	J	1-1/2	2-11/16	6	103178	6.07	S	1-3/4	3-1/16	6	103277	8.86	
B	1-3/8	2-1/2	12	103090	4.12	K	1-1/2	2-11/16	6	103189	6.17	T	1-3/4	3-1/16	6	103288	9.07	
C	1-3/8	2-1/2	12	103101	4.12	L	1-9/16	2-3/4	6	103200	6.31	U	1-13/16	3-1/8	6	103299	9.78	
D	1-3/8	2-1/2	12	103112	4.16	M	1-9/16	2-3/4	6	103211	6.61	V	1-7/8	3-1/4	6	103310	10.40	
E	1-3/8	2-1/2	12	103123	4.16	N	1-5/8	2-13/16	6	103222	6.88	W	1-7/8	3-1/4	6	103321	10.77	
F	1-7/16	2-5/8	6	103134	5.35	O	1-11/16	2-15/16	6	103233	7.74	X	1-15/16	3-5/16	6	103332	11.42	
G	1-7/16	2-5/8	6	103145	5.73	P	1-11/16	2-15/16	6	103244	7.94	Y	1-15/16	3-5/16	6	103343	11.66	
H	1-1/2	2-11/16	6	103156	5.90	Q	1-11/16	3	6	103255	8.28	Z	2	3-3/8	6	103354	12.07	
I	1-1/2	2-11/16	6	103167	5.93	R	1-11/16	3	6	103266	8.52	-	-	-	-	-	-	-

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	102419	3.27	21	1-1/16	2-1/8	12	102639	2.76	41	13/16	1-13/16	12	102859	2.11
2	1-5/16	2-7/16	12	102430	3.27	22	1-1/16	2-1/8	12	102650	2.69	42	3/4	1-3/4	12	102870	2.11
3	1-1/4	2-3/8	12	102441	3.37	23	1	2-1/16	12	102661	2.69	43	3/4	1-3/4	12	102881	2.11
4	1-1/4	2-3/8	12	102452	3.37	24	1	2-1/16	12	102672	2.69	44	3/4	1-3/4	12	102892	2.11
5	1-1/4	2-3/8	12	102463	3.37	25	1	2-1/16	12	102683	2.69	45	3/4	1-3/4	12	102903	2.11
6	1-1/4	2-3/8	12	102474	3.37	26	1	2-1/16	12	102694	2.69	46	3/4	1-3/4	12	102914	2.11
7	1-3/16	2-1/4	12	102485	2.90	27	1	2-1/16	12	102705	2.69	47	11/16	1-11/16	12	102925	2.11
8	1-3/16	2-1/4	12	102496	2.90	28	15/16	1-15/16	12	102716	2.69	48	11/16	1-11/16	12	102936	2.11
9	1-3/16	2-1/4	12	102507	2.90	29	15/16	1-15/16	12	102727	2.69	49	11/16	1-11/16	12	102947	2.11
10	1-3/16	2-1/4	12	102518	2.90	30	15/16	1-15/16	12	102738	2.11	50	11/16	1-11/16	12	102958	2.11
11	1-3/16	2-1/4	12	102529	2.90	31	7/8	1-7/8	12	102749	2.11	51	11/16	1-11/16	12	102969	2.11
12	1-3/16	2-1/4	12	102540	2.90	32	7/8	1-7/8	12	102760	2.11	52	11/16	1-11/16	12	102980	2.11
13	1-1/8	2-3/16	12	102551	2.90	33	7/8	1-7/8	12	102771	2.11	53	5/8	1-5/8	12	102991	2.11
14	1-1/8	2-3/16	12	102562	2.90	34	7/8	1-7/8	12	102782	2.11	54	5/8	1-5/8	12	103002	2.11
15	1-1/8	2-3/16	12	102573	2.90	35	7/8	1-7/8	12	102793	2.11	55	5/8	1-5/8	12	103013	2.11
16	1-1/8	2-3/16	12	102584	2.90	36	13/16	1-13/16	12	102804	2.11	56	1/2	1-3/8	12	103024	2.11
17	1-1/8	2-3/16	12	102595	2.90	37	13/16	1-13/16	12	102815	2.11	57	1/2	1-3/8	12	103035	2.11
18	1-1/16	2-1/8	12	102606	2.76	38	13/16	1-13/16	12	102826	2.11	58	1/2	1-3/8	12	103046	2.11
19	1-1/16	2-1/8	12	102617	2.76	39	13/16	1-13/16	12	102837	2.11	59	1/2	1-3/8	12	103057	2.11
20	1-1/16	2-1/8	12	102628	2.76	40	13/16	1-13/16	12	102848	2.11	60	1/2	1-3/8	12	103068	2.11

NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT.  
FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

155

## TAPER LENGTH - 118° POINT



OXIDE FINISH

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	1-1/8	2-1/4	12	113683	7.68	13/32	4-3/8	7	6	113936	27.91	49/64	6	9-7/8	1	114189	98.98
1/16	1-3/4	3	12	113694	8.00	27/64	4-5/8	7-1/4	6	113947	29.61	25/32	6	9-7/8	1	114200	98.98
5/64	2	3-3/4	12	113705	8.27	7/16	4-5/8	7-1/4	6	113958	29.61	51/64	6-1/8	10	1	114211	106.86
3/32	2-1/4	4-1/4	12	113716	8.76	29/64	4-3/4	7-1/2	6	113969	33.69	13/16	6-1/8	10	1	114222	106.86
7/64	2-1/2	4-5/8	12	113727	10.24	15/32	4-3/4	7-1/2	6	113980	33.69	53/64	6-1/8	10	1	114233	112.53
1/8	2-3/4	5-1/8	12	113738	10.53	31/64	4-3/4	7-3/4	6	113991	35.65	27/32	6-1/8	10	1	114244	112.53
9/64	3	5-3/8	12	113749	14.07	1/2	4-3/4	7-3/4	6	114002	35.65	55/64	6-1/8	10	1	114255	118.09
5/32	3	5-3/8	12	113760	14.21	33/64	4-3/4	8	1	114013	47.35	7/8	6-1/8	10	1	114266	118.09
11/64	3-3/8	5-3/4	12	113771	14.91	17/32	4-3/4	8	1	114024	47.35	57/64	6-1/8	10	1	114277	123.10
3/16	3-3/8	5-3/4	12	113782	13.88	35/64	4-7/8	8-1/4	1	114035	49.75	29/32	6-1/8	10	1	114288	123.10
13/64	3-5/8	6	12	113793	16.94	9/16	4-7/8	8-1/4	1	114046	49.75	59/64	6-1/8	10-3/4	1	114299	133.82
7/32	3-5/8	6	12	113804	18.26	37/64	4-7/8	8-3/4	1	114057	58.22	15/16	6-1/8	10-3/4	1	114310	133.82
15/64	3-3/4	6-1/8	12	113815	18.26	19/32	4-7/8	8-3/4	1	114068	58.22	61/64	6-3/8	11	1	114321	147.70
1/4	3-3/4	6-1/8	12	113826	15.76	39/64	4-7/8	8-3/4	1	114079	60.32	31/32	6-3/8	11	1	114332	147.70
17/64	3-7/8	6-1/4	6	113837	19.11	5/8	4-7/8	8-3/4	1	114090	60.32	63/64	6-3/8	11	1	114343	153.96
9/32	3-7/8	6-1/4	6	113848	19.11	41/64	5-1/8	9	1	114101	68.68	1	6-3/8	11	1	114354	153.96
19/64	4	6-3/8	6	113859	20.81	21/32	5-1/8	9	1	114112	68.68	1-1/16	6-5/8	11-1/4	1	114376	190.78
5/16	4	6-3/8	6	113870	20.81	43/64	5-3/8	9-1/4	1	114123	81.23	1-1/8	7-1/8	11-3/4	1	114398	212.36
21/64	4-1/8	6-1/2	6	113881	20.81	11/16	5-3/8	9-1/4	1	114134	81.23	1-3/16	7-3/8	12	1	114420	248.89
11/32	4-1/8	6-1/2	6	113892	20.81	45/64	5-5/8	9-1/2	1	114145	84.95	1-1/4	7-7/8	12-1/2	1	114442	266.56
23/64	4-1/4	6-3/4	6	113903	24.52	23/32	5-5/8	9-1/2	1	114156	84.95	1-5/16	8-5/8	14-1/4	1	114464	318.08
3/8	4-1/4	6-3/4	6	113914	24.52	47/64	5-7/8	9-3/4	1	114167	91.36	1-3/8	8-7/8	14-1/2	1	114486	341.13
25/64	4-3/8	6-3/4	6	113925	27.91	3/4	5-7/8	9-3/4	1	114178	91.36	-	-	-	-	-	-

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	19.15	15	3-3/8	5-3/4	12	114728	16.83	29	3	5-3/8	12	114882	16.83
2	3-3/4	6-1/8	12	114585	19.15	16	3-3/8	5-3/4	12	114739	16.83	30	3	5-3/8	12	114893	16.83
3	3-5/8	6	12	114596	18.52	17	3-3/8	5-3/4	12	114750	16.83	31	2-3/4	5-1/8	12	114904	16.50
4	3-5/8	6	12	114607	18.52	18	3-3/8	5-3/4	12	114761	16.83	32	2-3/4	5-1/8	12	114915	16.50
5	3-5/8	6	12	114618	18.52	19	3-3/8	5-3/4	12	114772	16.83	33	2-3/4	5-1/8	12	114926	16.50
6	3-5/8	6	12	114629	18.52	20	3-3/8	5-3/4	12	114783	16.83	34	2-3/4	5-1/8	12	114937	16.50
7	3-5/8	6	12	114640	18.52	21	3-3/8	5-3/4	12	114794	16.83	35	2-3/4	5-1/8	12	114948	16.50
8	3-5/8	6	12	114651	18.52	22	3-3/8	5-3/4	12	114805	16.83	36	2-1/2	4-5/8	12	114959	12.34
9	3-5/8	6	12	114662	18.52	23	3	5-3/8	12	114816	16.83	37	2-1/2	4-5/8	12	114970	12.34
10	3-5/8	6	12	114673	18.52	24	3	5-3/8	12	114827	16.83	38	2-1/2	4-5/8	12	114981	12.34
11	3-5/8	6	12	114684	18.52	25	3	5-3/8	12	114838	16.83	39	2-1/2	4-5/8	12	114992	10.83
12	3-5/8	6	12	114695	18.52	26	3	5-3/8	12	114849	16.83	40	2-1/2	4-5/8	12	115003	10.83
13	3-3/8	5-3/4	12	114706	16.83	27	3	5-3/8	12	114860	16.83	-	-	-	-	-	-
14	3-3/8	5-3/4	12	114717	16.83	28	3	5-3/8	12	114871	16.83	-	-	-	-	-	-

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

# HSS Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	37.23	13/16	#3	6-1/8	10-3/4	115641	124.79
13/64	#1	2-3/4	6	115212	37.23	53/64	#3	6-1/8	10-3/4	115652	138.24
7/32	#1	2-3/4	6	115223	37.23	27/32	#3	6-1/8	10-3/4	115663	134.52
15/64	#1	2-7/8	6-1/8	115234	37.23	55/64	#3	6-1/8	10-3/4	115674	151.79
1/4	#1	2-7/8	6-1/8	115245	37.23	7/8	#3	6-1/8	10-3/4	115685	138.60
17/64	#1	3	6-1/4	115256	37.23	57/64	#3	6-1/8	10-3/4	115696	146.37
9/32	#1	3	6-1/4	115267	37.23	29/32	#3	6-1/8	10-3/4	115707	146.37
19/64	#1	3-1/8	6-3/8	115278	39.44	59/64	#3	6-1/8	10-3/4	115718	148.40
5/16	#1	3-1/8	6-3/8	115289	41.46	15/16	#3	6-1/8	10-3/4	115729	139.08
21/64	#1	3-1/4	6-1/2	115300	41.46	61/64	#3	6-3/8	11	115740	152.45
11/32	#1	3-1/4	6-1/2	115311	41.46	31/32	#3	6-3/8	11	115751	151.42
23/64	#1	3-1/2	6-3/4	115322	42.31	63/64	#3	6-3/8	11	115762	161.77
3/8	#1	3-1/2	6-3/4	115333	42.31	1	#3	6-3/8	11	115773	153.96
25/64	#1	3-5/8	7	115344	50.26	1-1/64	#3	6-1/2	11-1/8	115784	179.00
13/32	#1	3-5/8	7	115355	50.26	1-1/32	#3	6-1/2	11-1/8	115795	177.67
27/64	#1	3-7/8	7-1/4	115366	54.13	1-3/64	#3	6-5/8	11-1/4	115806	186.14
7/16	#1	3-7/8	7-1/4	115377	54.13	1-1/16	#3	6-5/8	11-1/4	115817	177.67
29/64	#1	4-1/8	7-1/2	115388	54.13	1-5/64	#4	6-7/8	12-1/2	115828	211.48
15/32	#1	4-1/8	7-1/2	115399	54.13	1-3/32	#4	6-7/8	12-1/2	115839	211.48
31/64	#2	4-3/8	8-1/4	115410	59.21	1-7/64	#4	7-1/8	12-3/4	115850	219.95
1/2	#2	4-3/8	8-1/4	115421	55.42	1-1/8	#4	7-1/8	12-3/4	115861	219.95
33/64	#2	4-5/8	8-1/2	115432	63.89	1-9/64	#4	7-1/4	12-7/8	115872	236.89
17/32	#2	4-5/8	8-1/2	115443	65.99	1-5/32	#4	7-1/4	12-7/8	115883	228.42
35/64	#2	4-7/8	8-3/4	115454	69.52	1-11/64	#4	7-3/8	13	115894	236.89
9/16	#2	4-7/8	8-3/4	115465	67.68	1-3/16	#4	7-3/8	13	115905	236.89
37/64	#2	4-7/8	8-3/4	115476	74.02	1-13/64	#4	7-1/2	13-1/8	115916	253.79
19/32	#2	4-7/8	8-3/4	115487	72.76	1-7/32	#4	7-1/2	13-1/8	115927	253.79
39/64	#2	4-7/8	8-3/4	115498	77.00	1-1/4	#4	7-7/8	13-1/2	115949	265.64
5/8	#2	4-7/8	8-3/4	115509	73.61	1-5/16	#4	8-5/8	14-1/4	115982	326.55
41/64	#2	5-1/8	9	115520	84.62	1-3/8	#4	8-7/8	14-1/2	116004	348.53
21/32	#2	5-1/8	9	115531	82.93	1-7/16	#4	9-1/8	14-3/4	116026	382.37
43/64	#2	5-3/8	9-1/4	115542	91.36	1-1/2	#4	9-3/8	15	116048	401.01
11/16	#2	5-3/8	9-1/4	115553	86.28	1-9/16	#5	9-5/8	16-5/8	116070	488.98
45/64	#2	5-5/8	9-1/2	115564	94.75	1-5/8	#5	10	17	116092	527.90
23/32	#2	5-5/8	9-1/2	115575	91.54	1-11/16	#5	10-1/8	17-1/8	116114	582.07
47/64	#2	5-7/8	9-3/4	115586	101.52	1-3/4	#5	10-1/8	17-1/8	116136	619.30
3/4	#2	5-7/8	9-3/4	115597	100.68	1-13/16	#5	10-1/8	17-1/8	116158	664.96
49/64	#2	6	9-7/8	115608	121.33	1-7/8	#5	10-3/8	17-3/8	116180	693.72
25/32	#2	6	9-7/8	115619	120.63	1-15/16	#5	10-3/8	17-3/8	116202	747.88
51/64	#3	6-1/8	10-3/4	115630	132.82	2	#5	10-3/8	17-3/8	116224	774.95

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

157

DRILLS

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



**NAS 907 - M42 COBALT  
STRAW FINISH**

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
1/16	5/8	1-5/8	12	103365	2.32	7/32	1-1/4	2-3/8	12	103475	5.59	3/8	1-13/16	3-1/8	6	103585	13.26
5/64	11/16	1-11/16	12	103376	2.32	15/64	1-5/16	2-7/16	12	103486	6.00	25/64	1-7/8	3-1/4	6	103596	15.17
3/32	3/4	1-3/4	12	103387	2.32	1/4	1-3/8	2-1/2	12	103497	6.24	13/32	1-15/16	3-5/16	6	103607	15.68
7/64	13/16	1-13/16	12	103398	2.62	17/64	1-7/16	2-5/8	6	103508	7.12	27/64	2	3-3/8	6	103618	17.38
1/8	7/8	1-7/8	12	103409	3.03	9/32	1-1/2	2-11/16	6	103519	7.74	7/16	1-1/16	3-7/16	6	103629	17.86
9/64	15/16	1-15/16	12	103420	3.03	19/64	1-9/16	2-3/4	6	103530	8.96	29/64	2-1/8	3-9/16	6	103640	21.44
5/32	1	2-1/16	12	103431	3.34	5/16	1-5/8	2-13/16	6	103541	9.61	15/32	2-1/8	3-5/8	6	103651	21.44
11/64	1-1/16	2-1/8	12	103442	3.78	21/64	1-11/16	2-15/16	6	103552	10.67	31/64	2-3/16	3-11/16	6	103662	21.44
3/16	1-1/8	2-3/16	12	103453	4.43	11/32	1-11/16	3	6	103563	11.52	1/2	2-1/4	3-3/4	6	103673	21.44
13/64	1-3/16	2-1/4	12	103464	5.08	23/64	1-3/4	3-1/16	6	103574	13.26	-	-	-	-	-	-

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	7.16	J	1-1/2	2-11/16	6	104443	8.52	S	1-3/4	3-1/16	6	104542	16.19
B	1-3/8	2-1/2	12	104355	7.60	K	1-1/2	2-11/16	6	104454	8.52	T	1-3/4	3-1/16	6	104553	16.19
C	1-3/8	2-1/2	12	104366	7.60	L	1-9/16	2-3/4	6	104465	10.12	U	1-13/16	3-1/8	6	104564	16.19
D	1-3/8	2-1/2	12	104377	7.60	M	1-9/16	2-3/4	6	104476	10.12	V	1-7/8	3-1/4	6	104575	18.00
E	1-3/8	2-1/2	12	104388	6.92	N	1-5/8	2-13/16	6	104487	10.87	W	1-7/8	3-1/4	6	104586	18.00
F	1-7/16	2-5/8	6	104399	8.04	O	1-11/16	2-15/16	6	104498	12.03	X	1-15/16	3-5/16	6	104597	18.00
G	1-7/16	2-5/8	6	104410	8.04	P	1-11/16	2-15/16	6	104509	12.03	Y	1-15/16	3-5/16	6	104608	18.00
H	1-1/2	2-11/16	6	104421	8.52	Q	1-11/16	3	6	104520	13.02	Z	2	3-3/8	6	104619	20.62
I	1-1/2	2-11/16	6	104432	8.52	R	1-11/16	3	6	104531	13.02	-	-	-	-	-	-

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	6.88	21	1-1/16	2-1/8	12	103904	3.58	41	13/16	1-13/16	12	104124	2.42
2	1-5/16	2-7/16	12	103695	6.88	22	1-1/16	2-1/8	12	103915	3.58	42	3/4	1-3/4	12	104135	2.39
3	1-1/4	2-3/8	12	103706	6.88	23	1	2-1/16	12	103926	3.58	43	3/4	1-3/4	12	104146	2.39
4	1-1/4	2-3/8	12	103717	6.13	24	1	2-1/16	12	103937	3.58	44	3/4	1-3/4	12	104157	2.39
5	1-1/4	2-3/8	12	103728	6.13	25	1	2-1/16	12	103948	3.34	45	3/4	1-3/4	12	104168	2.39
6	1-1/4	2-3/8	12	103739	6.13	26	1	2-1/16	12	103959	3.34	46	3/4	1-3/4	12	104179	2.39
7	1-3/16	2-1/4	12	103750	4.84	27	1	2-1/16	12	103970	3.34	47	11/16	1-11/16	12	104190	2.39
8	1-3/16	2-1/4	12	103761	4.84	28	15/16	1-15/16	12	103981	3.03	48	11/16	1-11/16	12	104201	2.39
9	1-3/16	2-1/4	12	103772	4.84	29	15/16	1-15/16	12	103992	3.03	49	11/16	1-11/16	12	104212	2.39
10	1-3/16	2-1/4	12	103783	4.84	30	15/16	1-15/16	12	104003	2.86	50	11/16	1-11/16	12	104223	2.39
11	1-3/16	2-1/4	12	103794	4.70	31	7/8	1-7/8	12	104014	2.86	51	11/16	1-11/16	12	104234	2.39
12	1-3/16	2-1/4	12	103805	4.70	32	7/8	1-7/8	12	104025	2.86	52	11/16	1-11/16	12	104245	2.39
13	1-1/8	2-3/16	12	103816	4.60	33	7/8	1-7/8	12	104036	2.76	53	5/8	1-5/8	12	104256	2.69
14	1-1/8	2-3/16	12	103827	4.60	34	7/8	1-7/8	12	104047	2.76	54	5/8	1-5/8	12	104267	2.69
15	1-1/8	2-3/16	12	103838	4.60	35	7/8	1-7/8	12	104058	2.76	55	5/8	1-5/8	12	104278	2.69
16	1-1/8	2-3/16	12	103849	4.60	36	13/16	1-13/16	12	104069	2.76	56	1/2	1-3/8	12	104289	2.69
17	1-1/8	2-3/16	12	103860	4.43	37	13/16	1-13/16	12	104080	2.76	57	1/2	1-3/8	12	104300	2.69
18	1-1/16	2-1/8	12	103871	3.78	38	13/16	1-13/16	12	104091	2.52	58	1/2	1-3/8	12	104311	2.86
19	1-1/16	2-1/8	12	103882	3.58	39	13/16	1-13/16	12	104102	2.52	59	1/2	1-3/8	12	104322	2.86
20	1-1/16	2-1/8	12	103893	3.58	40	13/16	1-13/16	12	104113	2.52	60	1/2	1-3/8	12	104333	2.86

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

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

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.



# M42 Cobalt Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



NAS 907 - M42 COBALT  
ALTIN COATED

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
1/16	5/8	1-5/8	12	233990	4.20	7/32	1-1/4	2-3/8	12	234100	10.11	3/8	1-13/16	3-1/8	6	234210	23.97
5/64	11/16	1-11/16	12	234001	4.20	15/64	1-5/16	2-7/16	12	234111	10.87	25/64	1-7/8	3-1/4	6	234221	27.44
3/32	3/4	1-3/4	12	234012	4.20	1/4	1-3/8	2-1/2	12	234122	11.29	13/32	1-15/16	3-5/16	6	234232	28.31
7/64	13/16	1-13/16	12	234023	4.76	17/64	1-7/16	2-5/8	6	234133	12.85	27/64	2	3-3/8	6	234243	31.37
1/8	7/8	1-7/8	12	234034	5.52	9/32	1-1/2	2-11/16	6	234144	14.00	7/16	1-1/16	3-7/16	6	234254	32.27
9/64	15/16	1-15/16	12	234045	5.52	19/64	1-9/16	2-3/4	6	234155	16.19	29/64	2-1/8	3-9/16	6	234265	38.70
5/32	1	2-1/16	12	234056	6.04	5/16	1-5/8	2-13/16	6	234166	17.37	15/32	2-1/8	3-5/8	6	234276	38.70
11/64	1-1/16	2-1/8	12	234067	6.81	21/64	1-11/16	2-15/16	6	234177	19.28	31/64	2-3/16	3-11/16	6	234287	38.70
3/16	1-1/8	2-3/16	12	234078	8.02	11/32	1-11/16	3	6	234188	20.84	1/2	2-1/4	3-3/4	6	234298	38.70
13/64	1-3/16	2-1/4	12	234089	9.14	23/64	1-3/4	3-1/16	6	234199	23.97	-	-	-	-	-	-

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	1-5/16	2-7/16	12	234969	12.92	J	1-1/2	2-11/16	6	235068	15.42	S	1-3/4	3-1/16	6	235167	29.29
B	1-3/8	2-1/2	12	234980	13.72	K	1-1/2	2-11/16	6	235079	15.42	T	1-3/4	3-1/16	6	235178	29.29
C	1-3/8	2-1/2	12	234991	13.72	L	1-9/16	2-3/4	6	235090	18.27	U	1-13/16	3-1/8	6	235189	29.29
D	1-3/8	2-1/2	12	235002	13.72	M	1-9/16	2-3/4	6	235101	18.27	V	1-7/8	3-1/4	6	235200	32.48
E	1-3/8	2-1/2	12	235013	12.54	N	1-5/8	2-13/16	6	235112	19.63	W	1-7/8	3-1/4	6	235211	32.48
F	1-7/16	2-5/8	6	235024	14.52	O	1-11/16	2-15/16	6	235123	21.75	X	1-15/16	3-5/16	6	235222	32.48
G	1-7/16	2-5/8	6	235035	14.52	P	1-11/16	2-15/16	6	235134	21.75	Y	1-15/16	3-5/16	6	235233	32.48
H	1-1/2	2-11/16	6	235046	15.42	Q	1-11/16	3	6	235145	23.52	Z	2	3-3/8	6	235244	37.28
I	1-1/2	2-11/16	6	235057	15.42	R	1-11/16	3	6	235156	23.52	-	-	-	-	-	-

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	12.44	21	1-1/16	2-1/8	12	234529	6.46	41	13/16	1-13/16	12	234749	4.41
2	1-5/16	2-7/16	12	234320	12.44	22	1-1/16	2-1/8	12	234540	6.46	42	3/4	1-3/4	12	234760	4.34
3	1-1/4	2-3/8	12	234331	12.44	23	1	2-1/16	12	234551	6.46	43	3/4	1-3/4	12	234771	4.34
4	1-1/4	2-3/8	12	234342	11.12	24	1	2-1/16	12	234562	6.46	44	3/4	1-3/4	12	234782	4.34
5	1-1/4	2-3/8	12	234353	11.12	25	1	2-1/16	12	234573	6.04	45	3/4	1-3/4	12	234793	4.34
6	1-1/4	2-3/8	12	234364	11.12	26	1	2-1/16	12	234584	6.04	46	3/4	1-3/4	12	234804	4.34
7	1-3/16	2-1/4	12	234375	8.72	27	1	2-1/16	12	234595	6.04	47	11/16	1-11/16	12	234815	4.34
8	1-3/16	2-1/4	12	234386	8.72	28	15/16	1-15/16	12	234606	5.52	48	11/16	1-11/16	12	234826	4.34
9	1-3/16	2-1/4	12	234397	8.72	29	15/16	1-15/16	12	234617	5.52	49	11/16	1-11/16	12	234837	4.34
10	1-3/16	2-1/4	12	234408	8.72	30	15/16	1-15/16	12	234628	5.18	50	11/16	1-11/16	12	234848	4.34
11	1-3/16	2-1/4	12	234419	8.48	31	7/8	1-7/8	12	234639	5.18	51	11/16	1-11/16	12	234859	4.34
12	1-3/16	2-1/4	12	234430	8.48	32	7/8	1-7/8	12	234650	5.18	52	11/16	1-11/16	12	234870	4.34
13	1-1/8	2-3/16	12	234441	8.34	33	7/8	1-7/8	12	234661	5.00	53	5/8	1-5/8	12	234881	4.86
14	1-1/8	2-3/16	12	234452	8.34	34	7/8	1-7/8	12	234672	5.00	54	5/8	1-5/8	12	234892	4.86
15	1-1/8	2-3/16	12	234463	8.34	35	7/8	1-7/8	12	234683	5.00	55	5/8	1-5/8	12	234903	4.86
16	1-1/8	2-3/16	12	234474	8.30	36	13/16	1-13/16	12	234694	5.00	56	1/2	1-3/8	12	234914	4.86
17	1-1/8	2-3/16	12	234485	8.02	37	13/16	1-13/16	12	234705	5.00	57	1/2	1-3/8	12	234925	4.86
18	1-1/16	2-1/8	12	234496	6.81	38	13/16	1-13/16	12	234716	4.55	58	1/2	1-3/8	12	234936	5.18
19	1-1/16	2-1/8	12	234507	6.46	39	13/16	1-13/16	12	234727	4.55	59	1/2	1-3/8	12	234947	5.18
20	1-1/16	2-1/8	12	234518	6.46	40	13/16	1-13/16	12	234738	4.55	60	1/2	1-3/8	12	234958	5.18

- 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: SIZES BELOW 1/16" ARE NOT SPLIT POINT. ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK. FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

159

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



**NAS 907 - M42 COBALT  
STRAW FINISH**

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	111923	2.69
5/64	1	2	12	111934	2.69
3/32	1-1/4	2-1/4	12	111945	2.69
7/64	1-1/2	2-5/8	12	111956	2.83
1/8	1-5/8	2-3/4	12	111967	3.48
9/64	1-3/4	2-7/8	12	111978	3.48
5/32	2	3-1/8	12	111989	3.89
11/64	2-1/8	3-1/4	12	112000	4.09
3/16	2-5/16	3-1/2	12	112011	4.60
13/64	2-7/16	3-5/8	12	112022	5.52

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
7/32	2-1/2	3-3/4	12	112033	6.03
15/64	2-5/8	3-7/8	12	112044	6.41
1/4	2-3/4	4	12	112055	6.85
17/64	2-7/8	4-1/8	6	112066	7.77
9/32	2-15/16	4-1/4	6	112077	8.15
19/64	3-1/16	4-3/8	6	112088	9.92
5/16	3-3/16	4-1/2	6	112099	10.57
21/64	3-5/16	4-5/8	6	112110	11.69
11/32	3-7/16	4-3/4	6	112121	12.85
23/64	3-1/2	4-7/8	6	112132	14.72

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/8	3-5/8	5	6	112143	14.72
25/64	3-3/4	5-1/8	6	112154	16.74
13/32	3-7/8	5-1/4	6	112165	17.45
27/64	3-15/16	5-3/8	6	112176	19.29
7/16	4-1/16	5-1/2	6	112187	19.73
29/64	4-3/16	5-5/8	6	112198	23.69
15/32	4-5/16	5-3/4	6	112209	24.13
31/64	4-3/8	5-7/8	6	112220	24.27
1/2	4-1/2	6	6	112231	24.27
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	113122	7.26
B	2-3/4	4	12	113133	8.38
C	2-3/4	4	12	113144	8.38
D	2-3/4	4	12	113155	9.44
E	2-3/4	4	12	113166	6.85
F	2-7/8	4-1/8	6	113177	8.38
G	2-7/8	4-1/8	6	113188	8.38
H	2-7/8	4-1/8	6	113199	9.44
I	2-7/8	4-1/8	6	113210	9.44

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	113221	9.44
K	2-15/16	4-1/4	6	113232	9.44
L	2-15/16	4-1/4	6	113243	10.70
M	3-1/16	4-3/8	6	113254	11.35
N	3-1/16	4-3/8	6	113265	11.35
O	3-3/16	4-1/2	6	113276	12.54
P	3-5/16	4-5/8	6	113287	13.33
Q	3-7/16	4-3/4	6	113298	13.84
R	3-7/16	4-3/4	6	113309	13.84

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	113320	16.94
T	3-1/2	4-7/8	6	113331	16.94
U	3-5/8	5	6	113342	16.94
V	3-5/8	5	6	113353	18.68
W	3-3/4	5-1/8	6	113364	18.68
X	3-3/4	5-1/8	6	113375	18.68
Y	3-7/8	5-1/4	6	113386	19.80
Z	3-7/8	5-1/4	6	113397	21.54
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	112242	7.33
2	2-5/8	3-7/8	12	112253	7.33
3	2-1/2	3-3/4	12	112264	6.85
4	2-1/2	3-3/4	12	112275	6.85
5	2-1/2	3-3/4	12	112286	6.85
6	2-1/2	3-3/4	12	112297	6.85
7	2-7/16	3-5/8	12	112308	5.35
8	2-7/16	3-5/8	12	112319	5.35
9	2-7/16	3-5/8	12	112330	5.35
10	2-7/16	3-5/8	12	112341	5.35
11	2-5/16	3-1/2	12	112352	5.35
12	2-5/16	3-1/2	12	112363	5.35
13	2-5/16	3-1/2	12	112374	5.25
14	2-3/16	3-3/8	12	112385	5.25
15	2-3/16	3-3/8	12	112396	5.25
16	2-3/16	3-3/8	12	112407	4.77
17	2-3/16	3-3/8	12	112418	4.67
18	2-1/8	3-1/4	12	112429	4.26
19	2-1/8	3-1/4	12	112440	4.16
20	2-1/8	3-1/4	12	112451	4.16

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
21	2-1/8	3-1/4	12	112462	4.12
22	2	3-1/8	12	112473	4.12
23	2	3-1/8	12	112484	4.12
24	2	3-1/8	12	112495	4.12
25	1-7/8	3	12	112506	3.78
26	1-7/8	3	12	112517	3.72
27	1-7/8	3	12	112528	3.72
28	1-3/4	2-7/8	12	112539	3.48
29	1-3/4	2-7/8	12	112550	3.37
30	1-5/8	2-3/4	12	112561	3.20
31	1-5/8	2-3/4	12	112572	3.10
32	1-5/8	2-3/4	12	112583	3.07
33	1-1/2	2-5/8	12	112594	2.97
34	1-1/2	2-5/8	12	112605	2.97
35	1-1/2	2-5/8	12	112616	2.97
36	1-7/16	2-1/2	12	112627	2.93
37	1-7/16	2-1/2	12	112638	2.93
38	1-7/16	2-1/2	12	112649	2.73
39	1-3/8	2-3/8	12	112660	2.73
40	1-3/8	2-3/8	12	112671	2.73

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
41	1-3/8	2-3/8	12	112682	2.69
42	1-1/4	2-1/4	12	112693	2.66
43	1-1/4	2-1/4	12	112704	2.66
44	1-1/8	2-1/8	12	112715	2.66
45	1-1/8	2-1/8	12	112726	2.66
46	1-1/8	2-1/8	12	112737	2.66
47	1	2	12	112748	2.66
48	1	2	12	112759	2.66
49	1	2	12	112770	2.66
50	1	2	12	112781	2.66
51	1	2	12	112792	2.66
52	7/8	1-7/8	12	112803	2.66
53	7/8	1-7/8	12	112814	2.97
54	7/8	1-7/8	12	112825	2.97
55	7/8	1-7/8	12	112836	2.97
56	3/4	1-3/4	12	112847	3.34
57	3/4	1-3/4	12	112858	3.34
58	11/16	1-5/8	12	112869	3.34
59	11/16	1-5/8	12	112880	3.34
60	11/16	1-5/8	12	112891	3.34

**NOTE: SIZES BELOW 1/16" ARE NOT SPLIT POINT. ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK. FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.**

# M42 Cobalt Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



NAS 907 - M42 COBALT  
ALTIN COATED

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
1/16	7/8	1-7/8	12	235266	4.83	7/32	2-1/2	3-3/4	12	235376	10.91	3/8	3-5/8	5	6	235486	26.58
5/64	1	2	12	235277	4.83	15/64	2-5/8	3-7/8	12	235387	11.57	25/64	3-3/4	5-1/8	6	235497	30.22
3/32	1-1/4	2-1/4	12	235288	4.83	1/4	2-3/4	4	12	235398	12.40	13/32	3-7/8	5-1/4	6	235508	31.54
7/64	1-1/2	2-5/8	12	235299	5.11	17/64	2-7/8	4-1/8	6	235409	14.03	27/64	3-15/16	5-3/8	6	235519	34.88
1/8	1-5/8	2-3/4	12	235310	6.25	9/32	2-15/16	4-1/4	6	235420	14.73	7/16	4-1/16	5-1/2	6	235530	35.68
9/64	1-3/4	2-7/8	12	235321	6.25	19/64	3-1/16	4-3/8	6	235431	17.93	29/64	4-3/16	5-5/8	6	235541	42.80
5/32	2	3-1/8	12	235332	7.02	5/16	3-3/16	4-1/2	6	235442	19.07	15/32	4-5/16	5-3/4	6	235552	43.60
11/64	2-1/8	3-1/4	12	235343	7.40	21/64	3-5/16	4-5/8	6	235453	21.12	31/64	4-3/8	5-7/8	6	235563	43.84
3/16	2-5/16	3-1/2	12	235354	8.30	11/32	3-7/16	4-3/4	6	235464	23.21	1/2	4-1/2	6	6	235574	43.84
13/64	2-7/16	3-5/8	12	235365	9.97	23/64	3-1/2	4-7/8	6	235475	26.58	-	-	-	-	-	-

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	236245	13.10	J	2-7/8	4-1/8	6	236344	17.02	S	3-1/2	4-7/8	6	236443	30.64
B	2-3/4	4	12	236256	15.11	K	2-15/16	4-1/4	6	236355	17.02	T	3-1/2	4-7/8	6	236454	30.64
C	2-3/4	4	12	236267	15.11	L	2-15/16	4-1/4	6	236366	19.35	U	3-5/8	5	6	236465	30.64
D	2-3/4	4	12	236278	17.02	M	3-1/16	4-3/8	6	236377	20.53	V	3-5/8	5	6	236476	33.77
E	2-3/4	4	12	236289	12.40	N	3-1/16	4-3/8	6	236388	20.53	W	3-3/4	5-1/8	6	236487	33.77
F	2-7/8	4-1/8	6	236300	15.11	O	3-3/16	4-1/2	6	236399	22.68	X	3-3/4	5-1/8	6	236498	33.77
G	2-7/8	4-1/8	6	236311	15.11	P	3-5/16	4-5/8	6	236410	24.11	Y	3-7/8	5-1/4	6	236509	35.78
H	2-7/8	4-1/8	6	236322	17.02	Q	3-7/16	4-3/4	6	236421	24.98	Z	3-7/8	5-1/4	6	236520	38.91
I	2-7/8	4-1/8	6	236333	17.02	R	3-7/16	4-3/4	6	236432	24.98	-	-	-	-	-	-

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	13.27	21	2-1/8	3-1/4	12	235805	7.43	41	1-3/8	2-3/8	12	236025	4.83
2	2-5/8	3-7/8	12	235596	13.27	22	2	3-1/8	12	235816	7.43	42	1-1/4	2-1/4	12	236036	4.79
3	2-1/2	3-3/4	12	235607	12.40	23	2	3-1/8	12	235827	7.43	43	1-1/4	2-1/4	12	236047	4.79
4	2-1/2	3-3/4	12	235618	12.40	24	2	3-1/8	12	235838	7.43	44	1-1/8	2-1/8	12	236058	4.79
5	2-1/2	3-3/4	12	235629	12.40	25	1-7/8	3	12	235849	6.81	45	1-1/8	2-1/8	12	236069	4.79
6	2-1/2	3-3/4	12	235640	12.40	26	1-7/8	3	12	235860	6.74	46	1-1/8	2-1/8	12	236080	4.79
7	2-7/16	3-5/8	12	235651	9.66	27	1-7/8	3	12	235871	6.74	47	1	2	12	236091	4.79
8	2-7/16	3-5/8	12	235662	9.66	28	1-3/4	2-7/8	12	235882	6.32	48	1	2	12	236102	4.79
9	2-7/16	3-5/8	12	235673	9.66	29	1-3/4	2-7/8	12	235893	6.11	49	1	2	12	236113	4.79
10	2-7/16	3-5/8	12	235684	9.66	30	1-5/8	2-3/4	12	235904	5.73	50	1	2	12	236124	4.79
11	2-5/16	3-1/2	12	235695	9.66	31	1-5/8	2-3/4	12	235915	5.63	51	1	2	12	236135	4.79
12	2-5/16	3-1/2	12	235706	9.66	32	1-5/8	2-3/4	12	235926	5.56	52	7/8	1-7/8	12	236146	4.79
13	2-5/16	3-1/2	12	235717	9.48	33	1-1/2	2-5/8	12	235937	5.35	53	7/8	1-7/8	12	236157	5.38
14	2-3/16	3-3/8	12	235728	9.48	34	1-1/2	2-5/8	12	235948	5.35	54	7/8	1-7/8	12	236168	5.38
15	2-3/16	3-3/8	12	235739	9.48	35	1-1/2	2-5/8	12	235959	5.35	55	7/8	1-7/8	12	236179	5.38
16	2-3/16	3-3/8	12	235750	8.65	36	1-7/16	2-1/2	12	235970	5.28	56	3/4	1-3/4	12	236190	6.08
17	2-3/16	3-3/8	12	235761	8.44	37	1-7/16	2-1/2	12	235981	5.28	57	3/4	1-3/4	12	236201	6.08
18	2-1/8	3-1/4	12	235772	7.71	38	1-7/16	2-1/2	12	235992	4.90	58	11/16	1-5/8	12	236212	6.08
19	2-1/8	3-1/4	12	235783	7.50	39	1-3/8	2-3/8	12	236003	4.90	59	11/16	1-5/8	12	236223	6.08
20	2-1/8	3-1/4	12	235794	7.50	40	1-3/8	2-3/8	12	236014	4.90	60	11/16	1-5/8	12	236234	6.08

- 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: SIZES BELOW 1/16" ARE NOT SPLIT POINT. ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK. FOR COATING INFORMATION SEE PAGE 5. FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

161



**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	30.68
17/32	6	120602	30.68
35/64	6	120613	32.38
9/16	6	120624	32.38
37/64	6	120635	34.77
19/32	6	120646	34.77
39/64	6	120657	36.54
5/8	6	120668	36.54
41/64	6	120679	38.28
21/32	6	120690	38.28
43/64	6	120701	40.70
11/16	6	120712	40.70
45/64	6	120723	40.87
23/32	6	120734	40.87
47/64	6	120745	44.58
3/4	6	120756	44.72
49/64	6	120767	47.41
25/32	6	120778	47.41
51/64	6	120789	49.83
13/16	6	120800	49.83
53/64	6	120811	51.77
27/32	6	120822	51.77
55/64	6	120833	53.48
7/8	6	120844	53.48
57/64	6	120855	55.66
29/32	6	120866	55.66
59/64	6	120877	60.60
15/16	6	120888	60.60
61/64	6	120899	63.53
31/32	6	120910	63.53
63/64	6	120921	70.83
1	6	120932	70.83
1-1/32	6	120943	95.03
1-1/16	6	120954	95.03
1-3/32	6	120965	101.33
1-1/8	6	120976	108.25
1-5/32	6	120987	108.25
1-3/16	6	120998	119.84
1-7/32	6	121009	132.62
1-1/4	6	121020	132.62
1-5/16	6	121031	140.29
1-3/8	6	121042	161.59
1-7/16	6	121053	177.68
1-1/2	6	121064	195.23

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121075	33.44
17/32	6	121086	33.44
35/64	6	121097	35.55
9/16	6	121108	35.55
37/64	6	121119	38.21
19/32	6	121130	38.21
39/64	6	121141	39.98
5/8	6	121152	39.98
41/64	6	121163	42.64
21/32	6	121174	42.64
43/64	6	121185	44.34
11/16	6	121196	44.34
45/64	6	121207	44.92
23/32	6	121218	44.92
47/64	6	121229	48.94
3/4	6	121240	48.94
49/64	6	121251	52.22
25/32	6	121262	52.22
51/64	6	121273	57.23
13/16	6	121284	57.23
53/64	6	121295	59.61
27/32	6	121306	59.61
55/64	6	121317	63.60
7/8	6	121328	63.60
57/64	6	121339	65.99
29/32	6	121350	65.99
59/64	6	121361	67.55
15/16	6	121372	67.55
61/64	6	121383	70.72
31/32	6	121394	70.72
63/64	6	121405	77.51
1	6	121416	77.51

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

# Silver & Deming Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



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



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

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121779	39.16
17/32	6	121790	39.16
35/64	6	121801	41.48
9/16	6	121812	41.48
37/64	6	121823	44.04
19/32	6	121834	44.04
39/64	6	121845	45.77
5/8	6	121856	45.77
41/64	6	121867	48.57
21/32	6	121878	48.57
43/64	6	121889	50.65
11/16	6	121900	50.65
45/64	6	121911	52.76
23/32	6	121922	52.76
47/64	6	121933	55.05
3/4	6	121944	55.05
49/64	6	121955	58.11
25/32	6	121966	58.11
51/64	6	121977	61.83
13/16	6	121988	61.83
53/64	6	121999	64.52
27/32	6	122010	64.52
55/64	6	122021	66.26
7/8	6	122032	66.26
57/64	6	122043	69.16
29/32	6	122054	69.16
59/64	6	122065	74.34
15/16	6	122076	74.34
61/64	6	122087	80.06
31/32	6	122098	80.06
63/64	6	122109	84.08
1	6	122120	84.08

SIZE	OVERALL LENGTH	ITEM#	LIST PRICE
33/64	6	121427	61.01
17/32	6	121438	61.01
35/64	6	121449	73.42
9/16	6	121460	73.42
37/64	6	121471	75.90
19/32	6	121482	75.90
39/64	6	121493	77.85
5/8	6	121504	77.85
41/64	6	121515	81.66
21/32	6	121526	81.66
43/64	6	121537	83.33
11/16	6	121548	83.33
45/64	6	121559	87.90
23/32	6	121570	87.90
47/64	6	121581	91.72
3/4	6	121592	91.72
49/64	6	121603	95.91
25/32	6	121614	95.91
51/64	6	121625	98.47
13/16	6	121636	98.47
53/64	6	121647	106.41
27/32	6	121658	106.41
55/64	6	121669	106.41
7/8	6	121680	106.41
57/64	6	121691	110.47
29/32	6	121702	110.47
59/64	6	121713	115.24
15/16	6	121724	115.24
61/64	6	121735	121.61
31/32	6	121746	121.61
63/64	6	121757	138.00
1	6	121768	138.00

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA



## 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	6.26	116741	9.72
7/64	6	1-1/2	12	116444	6.78	116752	10.94
1/8	6	1-5/8	12	116455	6.67	116763	10.46
9/64	6	1-3/4	12	116466	7.95	116774	12.41
5/32	6	2	12	116477	7.95	116785	12.30
11/64	6	2-1/8	12	116488	8.69	116796	13.62
3/16	6	2-5/16	12	116499	8.69	116807	13.33
13/64	6	2-7/16	12	116510	10.57	116818	16.87
7/32	6	2-1/2	12	116521	10.57	116829	16.72
15/64	6	2-5/8	12	116532	11.78	116840	18.34
1/4	6	2-3/4	12	116543	11.56	116851	18.01
17/64	6	2-7/8	6	116554	26.44	-	-
9/32	6	2-15/16	6	116565	27.47	-	-
19/64	6	3-1/16	6	116576	32.26	-	-
5/16	6	3-3/16	6	116587	35.02	-	-
21/64	6	3-5/16	6	116598	38.04	-	-
11/32	6	3-7/16	6	116609	37.63	-	-
23/64	6	3-1/2	6	116620	42.24	-	-
3/8	6	3-5/8	6	116631	43.05	-	-

### WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	6	2-5/8	12	116642	12.45	116862	19.26
2	6	2-5/8	12	116653	12.45	116873	19.26
10	6	2-7/16	12	116664	10.09	116884	15.17
11	6	2-5/16	12	116675	9.28	116895	14.58
20	6	2-1/8	12	116686	8.36	116906	12.70
21	6	2-1/8	12	116697	8.36	116917	12.70
29	6	1-3/4	12	116708	8.47	116928	13.07
30	6	1-5/8	12	116719	6.78	116939	10.31
40	6	1-5/8	12	116730	6.15	116950	9.54

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

# Aircraft Extension Drills

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 12" OVERALL LENGTH - 135° SPLIT POINT



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



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

DRILLS

### FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1/8	12	1-5/8	12	116961	19.30	118314	30.12
9/64	12	1-3/4	12	116972	19.48	118325	33.80
5/32	12	2	12	116983	19.48	118336	30.82
11/64	12	2-1/8	12	116994	21.95	118347	33.51
3/16	12	2-5/16	12	117005	21.73	118358	32.59
13/64	12	2-7/16	12	117016	24.93	118369	42.64
7/32	12	2-1/2	12	117027	24.67	118380	38.44
15/64	12	2-5/8	12	117038	27.80	118391	41.17
1/4	12	2-3/4	12	117049	26.51	118402	39.33
17/64	12	2-7/8	6	117060	33.03	-	-
9/32	12	2-15/16	6	117071	33.73	-	-
19/64	12	3-1/16	6	117082	38.89	-	-
5/16	12	3-3/16	6	117093	42.57	-	-
21/64	12	3-5/16	6	117104	46.25	-	-
11/32	12	3-7/16	6	117115	45.73	-	-
23/64	12	3-1/2	6	117126	51.81	-	-
3/8	12	3-5/8	6	117137	52.29	-	-
25/64	12	3-3/4	6	117148	58.33	-	-
13/32	12	3-7/8	6	117159	56.23	-	-
27/64	12	3-15/16	6	117170	62.01	-	-
7/16	12	4-1/16	6	117181	62.12	-	-
29/64	12	4-3/16	6	117192	70.08	-	-
15/32	12	4-5/16	6	117203	72.62	-	-
31/64	12	4-3/8	6	117214	75.30	-	-
1/2	12	4-1/2	6	117225	74.49	-	-

### WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	12	2-5/8	12	117236	30.27	118413	42.64
10	12	2-7/16	12	117247	24.34	118424	34.10
11	12	2-5/16	12	117258	24.56	118435	34.10
20	12	2-1/8	12	117269	22.09	118446	31.26
21	12	2-1/8	12	117280	21.69	118457	31.26
29	12	1-3/4	12	117291	22.98	118468	32.81
30	12	1-5/8	12	117302	21.69	118479	31.26
40	12	1-3/8	12	117313	21.69	118490	31.26

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

MADE IN USA

165

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



**BRIGHT FINISH**

FRACTIONAL SIZES				
SIZE	FLUTE LENGTH	O.A.L.	ITEM#	LIST PRICE
1/8	9	12	117863	41.58
9/64	9	12	117874	60.26
5/32	9	12	117885	54.80
11/64	9	12	117896	46.73
3/16	9	12	117907	46.73
13/64	9	12	117918	56.63
7/32	9	12	117929	50.71
15/64	9	12	117940	50.71
1/4	9	12	117951	52.43
17/64	9	12	117962	54.26
9/32	9	12	117973	54.26
19/64	9	12	117984	56.25
5/16	9	12	117995	56.25
21/64	9	12	118006	60.26
11/32	9	12	118017	60.26
23/64	9	12	118028	60.26

FRACTIONAL SIZES				
SIZE	FLUTE LENGTH	O.A.L.	ITEM#	LIST PRICE
3/8	9	12	118039	55.52
25/64	9	12	118050	84.03
13/32	9	12	118061	84.03
27/64	9	12	118072	84.03
7/16	9	12	118083	71.76
29/64	9	12	118094	87.70
15/32	9	12	118105	78.91
31/64	9	12	118116	80.74
1/2	9	12	118127	80.74
17/32	9	12	118149	102.30
9/16	9	12	118171	102.30
19/32	9	12	118193	127.86
5/8	9	12	118215	124.23
11/16	9	12	118259	131.53
3/4	9	12	118303	148.15
-	-	-	-	-

**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	12.08
13/32	3/8	6	116246	13.64
27/64	3/8	6	116257	14.14
7/16	3/8	6	116268	15.09
29/64	3/8	6	116279	16.24
15/32	3/8	6	116290	17.39
31/64	3/8	6	116301	18.11
1/2	3/8	6	116312	18.69

FOR TECHNICAL INFORMATION PLEASE SEE PAGES 207-208.

## SCREW EXTRACTORS HIGH SPEED STEEL



SIZE	FOR SCREW & BOLT SIZES	PIPE SIZE	PKG. QTY.	ITEM#	LIST PRICE
1	3/16 - 1/4	-	1	115014	6.92
2	1/4 - 5/16	-	1	115025	7.38
3	5/16 - 7/16	-	1	115036	8.94
4	7/16 - 9/16	1/8	1	115047	9.48
5	9/16 - 3/4	1/4	1	115058	11.85
6	3/4 - 1	3/8	1	115069	26.02
7	1 - 1-3/8	1/2	1	115080	41.88
8	1-3/8 - 1-3/4	3/4	1	115091	56.98
9	1-3/4 - 2-1/8	1	1	115102	99.09
10	2-1/8 - 2-1/2	1-1/4	1	115113	257.14
11	2-1/2 - 3	1-1/2	1	115124	273.72
12	3 - 3-1/2	2	1	115135	363.10
SET	SIZES 1-5	-	1	115146	44.52

## DRILL DRIFTS



### OXIDE FINISH

SIZE	FOR USE WITH TAPER#	ITEM#	LIST PRICE
1	1	115157	24.65
2	2	115168	29.23
3	3	115179	33.47
4	4,5,6	115190	36.91



## STRAIGHT SHANK - STRAIGHT FLUTE



HSS & COBALT REAMERS

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	35.00	185920	38.74
#79	.0145	3/8	2	3/4	.0145	182719	35.00	185931	38.74
1/64	.0156	3/8	2	3/4	.0156	182730	35.00	185942	38.74
#78	.0160	3/8	2	7/8	.0160	182741	35.00	185953	38.74
#77	.0180	3/8	2	7/8	.0180	182752	35.00	185964	38.74
#76	.0200	3/8	2	7/8	.0200	182763	35.00	185975	38.74
#75	.0210	1/2	3	1	.0210	182774	35.00	185986	38.74
#74	.0225	1/2	3	1	.0225	182785	35.00	185997	38.74
#73	.0240	1/2	3	1-1/8	.0240	182796	35.00	186008	38.74
#72	.0250	1/2	3	1-1/8	.0250	182807	35.00	186019	38.74
#71	.0260	1/2	3	1-1/4	.0260	182818	35.00	186030	38.74
#70	.0280	1/2	3	1-1/4	.0280	182829	35.00	186041	38.74
#69	.0292	1/2	3	1-3/8	.0292	182840	35.00	186052	38.74
#68	.0310	1/2	3	1-3/8	.0310	182851	35.00	186063	38.74
1/32	.0312	1/2	3	1-3/8	.0312	182862	27.59	186074	31.88
#67	.0320	1/2	3	1-3/8	.0320	182873	29.31	186085	31.88
#66	.0330	1/2	3	1-3/8	.0330	182884	29.31	186096	31.88
#65	.0350	1/2	3	1-1/2	.0350	182895	29.31	186107	31.88
#64	.0360	1/2	3	1-1/2	.0360	182906	29.31	186118	31.88
#63	.0370	1/2	3	1-1/2	.0370	182917	29.31	186129	31.88
#62	.0380	1/2	3	1-1/2	.0380	182928	29.31	186140	31.88
#61	.0390	1/2	3	1-1/2	.0390	182939	29.31	186151	31.88
1.0mm	.0394	1/2	4	2-1/2	.0394	182950	29.31	186162	31.88
#60	.0400	1/2	4	2-1/2	.0390	182961	29.31	186173	31.88
#59	.0410	1/2	4	2-1/2	.0390	182972	29.31	186184	31.88
#58	.0420	1/2	4	2-1/2	.0390	182983	29.31	186195	31.88
#57	.0430	1/2	4	2-1/2	.0390	182994	29.31	186206	31.88
#56	.0465	1/2	4	2-1/2	.0455	183005	29.31	186217	31.88
3/64	.0469	1/2	4	2-1/2	.0455	183016	29.31	186228	31.88
#55	.0520	1/2	4	2-1/2	.0510	183027	29.31	186239	31.88
#54	.0550	1/2	4	2-1/2	.0510	183038	29.31	186250	31.88
1.5mm	.0591	1/2	4	2-1/2	.0510	183049	29.31	186261	31.88
#53	.0595	1/2	4	2-1/2	.0585	183060	29.31	186272	31.88
1/16	.0625	1/2	4	2-1/2	.0585	183071	26.35	186283	31.88
#52	.0635	1/2	4	2-1/2	.0585	183082	26.35	186294	31.88
#51	.0670	3/4	4	3	.0660	183093	23.58	186305	25.26
#50	.0700	3/4	4	3	.0660	183104	23.58	186316	25.26
#49	.0730	3/4	4	3	.0660	183115	23.58	186327	25.26
#48	.0760	3/4	4	3	.0720	183126	23.58	186338	25.26
5/64	.0781	3/4	4	3	.0720	183137	23.58	186349	25.26
#47	.0785	3/4	4	3	.0720	183148	23.58	186360	25.26
2.0mm	.0787	3/4	4	3	.0720	183159	23.58	186371	25.26
#46	.0810	3/4	4	3	.0771	183170	23.58	186382	25.26
#45	.0820	3/4	4	3	.0771	183181	23.58	186393	25.26
#44	.0860	3/4	4	3	.0810	183192	23.58	186404	25.26
#43	.0890	3/4	4	3	.0810	183203	23.58	186415	25.26

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



# Chucking Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT SHANK - STRAIGHT FLUTE



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#42	.0935	3/4	4	3	.0880	183214	23.58	186426	25.26
3/32	.0938	3/4	4	3	.0880	183225	21.20	186437	25.26
#41	.0960	7/8	4	3-1/2	.0928	183236	23.81	186448	25.45
#40	.0980	7/8	4	3-1/2	.0928	183247	23.81	186459	25.45
2.5mm	.0984	7/8	4	3-1/2	.0928	183258	23.81	186470	25.45
#39	.0995	7/8	4	3-1/2	.0928	183269	23.81	186481	25.45
#38	.1015	7/8	4	3-1/2	.0950	183280	23.81	186492	25.45
#37	.1040	7/8	4	3-1/2	.0950	183291	23.81	186503	25.45
#36	.1065	7/8	4	3-1/2	.1030	183302	23.81	186514	25.45
7/64	.1094	7/8	4	3-1/2	.1030	183313	24.55	186525	26.23
#35	.1100	7/8	4	3-1/2	.1030	183324	24.55	186536	26.23
#34	.1110	7/8	4	3-1/2	.1055	183335	24.55	186547	26.23
#33	.1130	7/8	4	3-1/2	.1055	183346	24.55	186558	26.23
#32	.1160	7/8	4	3-1/2	.1120	183357	24.55	186569	26.23
3.0mm	.1181	7/8	4	3-1/2	.1120	183368	24.55	186580	26.23
#31	.1200	7/8	4	3-1/2	.1120	183379	24.55	186591	26.23
o/u	.1240	7/8	4	3-1/2	.1190	183390	24.55	186602	26.23
1/8	.1250	7/8	4	3-1/2	.1190	183401	19.57	186613	20.97
o/u	.1260	7/8	4	3-1/2	.1190	183412	24.55	186624	26.23
#30	.1285	7/8	4	3-1/2	.1190	183423	24.55	186635	26.23
#29	.1360	1	4	4	.1275	183434	29.31	186646	31.38
3.5mm	.1378	1	4	4	.1350	183445	29.31	186657	31.38
#28	.1405	1	4	4	.1350	183456	29.31	186668	31.38
9/64	.1406	1	4	4	.1350	183467	29.31	186679	31.38
#27	.1440	1	4	4	.1350	183478	29.31	186690	31.38
#26	.1470	1	4	4	.1430	183489	29.31	186701	31.38
#25	.1495	1	4	4	.1430	183500	29.31	186712	31.38
#24	.1520	1	4	4	.1460	183511	29.31	186723	31.38
#23	.1540	1	4	4	.1460	183522	29.31	186734	31.38
5/32	.1562	1	4	4	.1510	183533	29.31	186745	31.38
#22	.1570	1	6	4	.1510	183544	29.31	186756	31.38
4.0mm	.1575	1	6	4	.1510	183555	29.31	186767	31.38
#21	.1590	1-1/8	6	4-1/2	.1530	183566	31.30	186778	33.48
#20	.1610	1-1/8	6	4-1/2	.1530	183577	31.30	186789	33.48
#19	.1660	1-1/8	6	4-1/2	.1595	183588	31.30	186800	33.48
#18	.1695	1-1/8	6	4-1/2	.1595	183599	31.30	186811	33.48
11/64	.1719	1-1/8	6	4-1/2	.1645	183610	31.30	186822	33.48
#17	.1730	1-1/8	6	4-1/2	.1645	183621	31.30	186833	33.48
#16	.1770	1-1/8	6	4-1/2	.1704	183632	31.30	186844	33.48
4.5mm	.1772	1-1/8	6	4-1/2	.1704	183643	31.30	186855	33.48
#15	.1800	1-1/8	6	4-1/2	.1755	183654	31.30	186866	33.48
#14	.1820	1-1/8	6	4-1/2	.1755	183665	31.30	186877	33.48
#13	.1850	1-1/8	6	4-1/2	.1805	183676	31.30	186888	33.48
o/u	.1865	1-1/8	6	4-1/2	.1805	183687	31.30	186899	33.48
3/16	.1875	1-1/8	6	4-1/2	.1805	183698	28.14	186910	32.35
o/u	.1885	1-1/8	6	4-1/2	.1805	183709	31.30	186921	33.48

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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

MADE IN USA

169

HSS & COBALT REAMERS

## STRAIGHT SHANK - STRAIGHT FLUTE



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#12	.1890	1-1/8	6	4-1/2	.1805	183720	31.30	186932	33.48
#11	.1910	1-1/4	6	5	.1860	183731	35.04	186943	40.46
#10	.1935	1-1/4	6	5	.1860	183742	35.04	186954	40.46
#9	.1960	1-1/4	6	5	.1895	183753	35.04	186965	40.46
5.0mm	.1969	1-1/4	6	5	.1895	183764	35.04	186976	40.46
#8	.1990	1-1/4	6	5	.1895	183775	35.04	186987	40.46
#7	.2010	1-1/4	6	5	.1895	183786	35.04	186998	40.46
13/64	.2031	1-1/4	6	5	.1945	183797	35.04	187009	40.46
#6	.2040	1-1/4	6	5	.1945	183808	35.04	187020	40.46
#5	.2055	1-1/4	6	5	.2016	183819	35.04	187031	40.46
#4	.2090	1-1/4	6	5	.2016	183830	35.04	187042	40.46
#3	.2130	1-1/4	6	5	.2075	183841	35.04	187053	40.46
5.5mm	.2165	1-1/4	6	5	.2075	183852	35.04	187064	40.46
7/32	.2188	1-1/4	6	5	.2075	183863	35.04	187075	40.46
#2	.2210	1-1/2	6	6	.2173	183874	36.01	187086	41.63
#1	.2280	1-1/2	6	6	.2173	183885	36.01	187097	41.63
A	.2340	1-1/2	6	6	.2265	183896	36.01	187108	41.63
15/64	.2344	1-1/2	6	6	.2265	183907	36.01	187119	41.63
6.0mm	.2362	1-1/2	6	6	.2265	183918	37.96	187130	41.82
B	.2380	1-1/2	6	6	.2329	183929	37.96	187141	41.82
C	.2420	1-1/2	6	6	.2329	183940	37.96	187152	41.82
D	.2460	1-1/2	6	6	.2329	183951	37.96	187163	38.00
o/u	.2490	1-1/2	6	6	.2405	183962	34.18	187174	37.61
1/4	.2500	1-1/2	6	6	.2405	183973	32.23	187185	35.55
o/u	.2510	1-1/2	6	6	.2405	183984	34.18	187196	37.65
6.5mm	.2559	1-1/2	6	6	.2405	183995	37.96	187207	41.82
F	.2570	1-1/2	6	6	.2485	184006	37.96	187218	41.82
G	.2610	1-1/2	6	6	.2485	184017	37.96	187229	41.82
17/64	.2656	1-1/2	6	6	.2485	184028	42.29	187240	56.71
H	.2660	1-1/2	6	6	.2485	184039	42.29	187251	56.71
I	.2720	1-1/2	6	6	.2485	184050	42.29	187262	56.71
7.0mm	.2756	1-1/2	6	6	.2485	184061	42.29	187273	56.71
J	.2770	1-1/2	6	6	.2485	184072	42.29	187284	56.71
K	.2810	1-1/2	6	6	.2485	184083	42.29	187295	56.71
9/32	.2812	1-1/2	6	6	.2485	184094	40.14	187306	53.86
L	.2900	1-1/2	6	6	.2792	184105	42.29	187317	56.71
M	.2950	1-1/2	6	6	.2792	184116	42.29	187328	56.71
7.5mm	.2953	1-1/2	6	6	.2792	184127	42.29	187339	56.71
19/64	.2969	1-1/2	6	6	.2792	184138	42.29	187350	56.71
N	.3020	1-1/2	6	6	.2792	184149	42.29	187361	56.71
o/u	.3115	1-1/2	6	6	.2792	184160	40.14	187372	53.86
5/16	.3125	1-1/2	6	6	.2792	184171	38.12	187383	51.02
o/u	.3135	1-1/2	6	6	.2792	184182	40.14	187394	53.86
8.0mm	.3150	1-1/2	6	6	.2792	184193	42.29	187405	56.71
O	.3160	1-1/2	6	6	.2792	184204	42.29	187416	56.71
P	.3230	1-1/2	6	6	.2792	184215	45.21	187427	61.11

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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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT SHANK - STRAIGHT FLUTE



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
21/64	.3281	1-1/2	6	6	.2792	184226	45.21	187438	61.11
Q	.3320	1-1/2	6	6	.2792	184237	45.21	187449	61.11
8.5mm	.3346	1-1/2	6	6	.2792	184248	45.21	187460	61.11
R	.3390	1-1/2	6	6	.2792	184259	45.21	187471	61.11
11/32	.3438	1-1/2	6	6	.2792	184270	45.21	187482	61.11
S	.3480	1-3/4	6	6	.3105	184281	45.68	187493	62.13
9.0mm	.3543	1-3/4	6	7	.3105	184292	45.68	187504	62.13
T	.3580	1-3/4	6	7	.3105	184303	45.68	187515	62.13
23/64	.3594	1-3/4	6	7	.3105	184314	45.68	187526	62.13
U	.3680	1-3/4	6	7	.3105	184325	45.68	187537	62.13
9.5mm-o/u	.3740	1-3/4	6	7	.3105	184336	43.38	187548	58.97
3/8	.3750	1-3/4	6	7	.3105	184347	41.04	187559	55.89
o/u	.3760	1-3/4	6	7	.3105	184358	43.38	187570	58.97
V	.3770	1-3/4	6	7	.3105	184369	49.65	187581	75.73
W	.3860	1-3/4	6	7	.3105	184380	49.65	187592	75.73
25/64	.3906	1-3/4	6	7	.3105	184391	49.65	187603	75.73
10.0mm	.3937	1-3/4	6	7	.3105	184402	49.65	187614	75.73
X	.3970	1-3/4	6	7	.3105	184413	49.65	187625	75.73
Y	.4040	1-3/4	6	7	.3105	184424	51.53	187636	75.73
13/32	.4062	1-3/4	6	7	.3105	184435	51.53	187647	75.73
Z	.4130	1-3/4	6	7	.3730	184446	51.53	187658	75.73
10.5mm	.4134	1-3/4	6	7	.3730	184457	52.03	187669	75.73
27/64	.4219	1-3/4	6	7	.3730	184468	51.53	187680	75.73
11.0mm	.4331	1-3/4	6	7	.3730	184479	51.53	187691	75.73
o/u	.4365	1-3/4	6	7	.3730	184490	48.95	187702	75.73
7/16	.4375	1-3/4	6	7	.3730	184501	48.95	187713	75.73
o/u	.4385	1-3/4	6	7	.3730	184512	48.95	187724	75.73
11.5mm	.4528	1-3/4	6	7	.3730	184523	56.12	187735	86.80
29/64	.4531	1-3/4	6	7	.3730	184534	56.12	187746	86.80
15/32	.4688	1-3/4	6	7	.3730	184545	56.12	187757	86.80
12.0mm	.4724	2	6	8	.4355	184556	56.12	187768	86.80
31/64	.4844	2	6	8	.4355	184567	56.12	187779	86.80
12.5mm	.4921	2	6	8	.4355	184578	56.12	187790	86.80
o/u	.4990	2	6	8	.4355	184589	53.28	187801	86.80
1/2	.5000	2	6	8	.4355	184600	53.28	187812	86.80
o/u	.5010	2	6	8	.4355	184611	53.28	187823	86.80
13.0mm	.5118	2	6	8	.4355	184622	69.53	-	-
33/64	.5156	2	6	8	.4355	184633	69.53	-	-
17/32	.5312	2	6	8	.4355	184644	66.22	187834	97.36
13.5mm	.5315	2	6	8	.4355	184655	69.53	-	-
35/64	.5469	2	8	8	.4355	184666	69.53	-	-
14.0mm	.5512	2	8	8	.4355	184677	69.53	-	-
o/u	.5615	2	8	8	.4355	184688	69.53	-	-
9/16	.5625	2	8	8	.4355	184699	66.22	187845	97.36
o/u	.5635	2	8	8	.4355	184710	69.53	-	-
14.5mm	.5709	2	8	8	.4355	184721	69.53	-	-

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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

MADE IN USA

171

HSS & COBALT REAMERS

## STRAIGHT SHANK - STRAIGHT FLUTE



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
37/64	.5781	2	8	8	.4355	184732	69.53	-	-
15.0mm	.5906	2	8	8	.4355	184743	69.53	-	-
19/32	.5938	2	8	8	.4355	184754	66.22	187856	97.36
39/64	.6094	2-1/4	8	9	.5615	184765	81.15	-	-
15.5mm	.6102	2-1/4	8	9	.5615	184776	81.15	-	-
o/u	.6240	2-1/4	8	9	.5615	184787	81.15	-	-
5/8	.6250	2-1/4	8	9	.5615	184798	77.56	187867	113.61
o/u	.6260	2-1/4	8	9	.5615	184809	81.15	-	-
16.0mm	.6299	2-1/4	8	9	.5615	184820	81.15	-	-
41/64	.6406	2-1/4	8	9	.5615	184831	81.15	-	-
16.5mm	.6496	2-1/4	8	9	.5615	184842	81.15	-	-
21/32	.6562	2-1/4	8	9	.5615	184853	87.38	187878	128.42
17.0mm	.6693	2-1/4	8	9	.5615	184864	91.71	-	-
43/64	.6719	2-1/4	8	9	.5615	184875	91.71	-	-
o/u	.6865	2-1/4	8	9	.5615	184886	91.71	-	-
11/16	.6875	2-1/4	8	9	.5615	184897	87.38	187889	128.42
o/u	.6885	2-1/4	8	9	.5615	184908	98.45	-	-
17.5mm	.6890	2-1/4	8	9	.5615	184919	98.45	-	-
45/64	.7031	2-1/4	8	9	.5615	184930	98.45	-	-
18.0mm	.7087	2-1/4	8	9	.5615	184941	98.45	-	-
23/32	.7188	2-1/4	8	9	.5615	184952	97.52	187900	143.35
18.5mm	.7283	2-1/2	8	9	.6240	184963	102.35	-	-
47/64	.7344	2-1/2	8	9	.6240	184974	113.38	-	-
19.0mm	.7480	2-1/2	8	9	.6240	184985	113.38	-	-
o/u	.7490	2-1/2	8	9	.6240	184996	113.38	-	-
3/4	.7500	2-1/2	8	9	.6240	185007	98.10	187911	144.17
o/u	.7510	2-1/2	8	9	.6240	185018	109.13	-	-
49/64	.7656	2-1/2	8	9	.6240	185029	109.13	-	-
19.5mm	.7677	2-1/2	8	9	.6240	185040	109.13	-	-
25/32	.7812	2-1/2	8	9	.6240	185051	105.78	187922	155.47
20.0mm	.7874	2-1/2	8	9	.6240	185062	116.85	-	-
51/64	.7969	2-1/2	8	9	.6240	185073	116.85	-	-
20.5mm	.8071	2-1/2	8	9	.6240	185084	116.85	-	-
o/u	.8115	2-1/2	8	9	.6240	185095	116.85	-	-
13/16	.8125	2-1/2	8	9	.6240	185106	105.78	187933	155.47
o/u	.8135	2-1/2			.6240	185117	116.85	-	-
21.0mm	.8268	2-1/2	8	9-1/2	.6240	185128	116.85	-	-
53/64	.8281	2-1/2	8	9-1/2	.6240	185139	116.85	-	-
27/32	.8438	2-1/2	8	9-1/2	.6240	185150	125.15	187944	183.96
21.5mm	.8465	2-5/8	8	10	.7490	185161	136.22	-	-
55/64	.8594	2-5/8	8	10	.7490	185172	136.22	-	-
22.0mm	.8661	2-5/8	8	10	.7490	185183	136.22	-	-
o/u	.8740	2-5/8	8	10	.7490	185194	136.22	-	-
7/8	.8750	2-5/8	8	10	.7490	185205	128.03	187955	188.25
o/u	.8760	2-5/8	8	10	.7490	185216	139.14	-	-
22.5mm	.8858	2-5/8	8	10	.7490	185227	139.14	-	-

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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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT SHANK - STRAIGHT FLUTE



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
57/64	.8906	2-5/8	8	10	.7490	185238	139.14	-	-
23.0mm	.9055	2-5/8	8	10	.7490	185249	139.14	-	-
29/32	.9062	2-5/8	8	10	.7490	185260	138.01	187966	202.83
59/64	.9219	2-5/8	8	10	.7490	185271	149.00	-	-
23.5mm	.9252	2-5/8	8	10	.7490	185282	149.00	-	-
o/u	.9365	2-5/8	8	10	.7490	185293	149.00	-	-
15/16	.9375	2-5/8	8	10	.7490	185304	138.01	187977	202.83
o/u	.9385	2-5/8	8	10	.7490	185315	149.00	-	-
24.0mm	.9449	2-5/8	8	10	.7490	185326	149.00	-	-
61/64	.9531	2-5/8	8	10	.7490	185337	149.00	-	-
24.5mm	.9646	2-5/8	8	10	.7490	185348	149.00	-	-
31/32	.9688	2-5/8	8	10	.7490	185359	154.58	187988	227.15
25.0mm	.9843	2-3/4	8	10-1/2	.8740	185370	158.20	-	-
63/64	.9844	2-3/4	8	10-1/2	.8740	185381	158.20	-	-
o/u	.9990	2-3/4	8	10-1/2	.8740	185392	158.20	-	-
1	1.0000	2-3/4	8	10-1/2	.8740	185403	156.02	187999	229.29
o/u	1.0010	2-3/4	8	10-1/2	.8740	185414	167.05	-	-
1-1/32	1.0312	2-3/4	8	10-1/2	.8740	185425	217.05	-	-
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	185436	172.93	188010	254.20
1-3/32	1.0938	2-7/8	8	11	.8740	185447	227.97	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	185458	183.81	188021	270.14
1-5/32	1.1562	2-7/8	10	11	.9990	185469	259.38	-	-
1-3/16	1.1875	2-7/8	10	11	.9990	185480	215.26	188032	316.44
1-7/32	1.2188	3	10	11-1/2	.9990	185491	272.28	-	-
1-1/4	1.2500	3	10	11-1/2	.9990	185502	228.12	188043	335.30
1-9/32	1.2812	3	10	11-1/2	.9990	185513	310.28	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	185524	266.08	188054	391.08
1-11/32	1.3438	3-1/4	10	12	.9990	185535	323.77	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	185546	279.61	188065	411.03
1-13/32	1.4062	3-1/4	10	12	1.2490	185557	344.00	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	185568	299.84	188076	440.85
1-15/32	1.4688	3-1/2	10	12-1/2	1.2490	185579	367.07	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	185590	322.87	188087	474.64
1-9/16	1.5625	3-1/2	12	13	1.2490	192124	457.10	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192135	457.10	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192146	524.96	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192157	524.96	-	-
1-13/16	1.8125	4	12	14	1.4990	192168	604.62	-	-
1-7/8	1.8750	4	12	14	1.4990	192179	604.62	-	-
1-15/16	1.9375	4	12	14	1.4990	192190	709.04	-	-
2	2.0000	4	12	14	1.4990	192201	709.04	-	-

HSS & COBALT REAMERS

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+ .0002, -.0000	+ .0003, -.0000	+ .0001, +.0004	+ .0002, +.0006

MADE IN USA

173



## INTERMEDIATE SIZES - HIGH SPEED STEEL

HSS & COBALT REAMERS

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
0.0140	172346	43.57	0.0490	172863	34.30	0.0770	173380	30.75	0.1060	173897	30.75	0.1340	174414	36.05
0.0150	172357	43.57	0.0495	172874	34.30	0.0775	173391	30.75	0.1070	173908	30.75	0.1345	174425	36.05
0.0155	172368	43.57	0.0500	172885	34.30	0.0780	173402	30.75	0.1075	173919	30.75	0.1350	174436	36.05
0.0165	172379	43.57	0.0505	172896	34.30	0.0790	173413	30.75	0.1080	173930	30.75	0.1355	174447	36.05
0.0170	172390	43.57	0.0510	172907	34.30	0.0795	173424	30.75	0.1085	173941	30.75	0.1365	174458	36.05
0.0175	172401	43.57	0.0515	172918	34.30	0.0800	173435	30.75	0.1090	173952	30.75	0.1370	174469	36.05
0.0185	172412	43.57	0.0525	172929	34.30	0.0805	173446	30.75	0.1095	173963	26.58	0.1375	174480	36.05
0.0190	172423	43.57	0.0530	172940	34.30	0.0815	173457	30.75	0.1105	173974	26.58	0.1380	174491	36.05
0.0195	172434	43.57	0.0535	172951	34.30	0.0825	173468	30.75	0.1115	173985	26.58	0.1385	174502	36.05
0.0205	172445	39.68	0.0540	172962	34.30	0.0830	173479	30.75	0.1120	173996	26.58	0.1390	174513	36.05
0.0215	172456	39.68	0.0545	172973	34.30	0.0835	173490	30.75	0.1125	174007	26.58	0.1395	174524	36.05
0.0220	172467	39.68	0.0555	172984	34.30	0.0840	173501	30.75	0.1135	174018	26.58	0.1400	174535	36.05
0.0230	172478	39.68	0.0560	172995	34.30	0.0845	173512	30.75	0.1140	174029	26.58	0.1410	174546	34.30
0.0235	172489	39.68	0.0565	173006	34.30	0.0850	173523	30.75	0.1145	174040	26.58	0.1415	174557	34.30
0.0245	172500	39.68	0.0570	173017	34.30	0.0855	173534	30.75	0.1150	174051	26.58	0.1420	174568	34.30
0.0255	172511	39.68	0.0575	173028	34.30	0.0865	173545	30.75	0.1155	174062	26.58	0.1425	174579	34.30
0.0265	172522	39.68	0.0580	173039	34.30	0.0870	173556	30.75	0.1165	174073	26.58	0.1430	174590	34.30
0.0270	172533	39.68	0.0585	173050	34.30	0.0875	173567	30.75	0.1170	174084	26.58	0.1435	174601	34.30
0.0275	172544	39.68	0.0590	173061	34.30	0.0880	173578	30.75	0.1175	174095	26.58	0.1445	174612	34.30
0.0285	172555	39.68	0.0600	173072	34.30	0.0885	173589	30.75	0.1180	174106	26.58	0.1450	174623	34.30
0.0290	172566	39.68	0.0605	173083	34.30	0.0895	173600	30.75	0.1185	174117	26.58	0.1455	174634	34.30
0.0295	172577	36.05	0.0610	173094	34.30	0.0900	173611	30.75	0.1190	174128	26.58	0.1460	174645	34.30
0.0300	172588	36.05	0.0615	173105	34.30	0.0905	173622	30.75	0.1195	174139	26.58	0.1465	174656	34.30
0.0305	172599	36.05	0.0620	173116	34.30	0.0910	173633	30.75	0.1205	174150	26.58	0.1475	174667	34.30
0.0315	172610	36.05	0.0630	173127	30.75	0.0915	173644	30.75	0.1210	174161	26.58	0.1480	174678	34.30
0.0325	172621	36.05	0.0640	173138	30.75	0.0920	173655	30.75	0.1215	174172	26.58	0.1485	174689	34.30
0.0335	172632	36.05	0.0645	173149	30.75	0.0925	173666	30.75	0.1220	174183	26.58	0.1490	174700	34.30
0.0340	172643	36.05	0.0650	173160	30.75	0.0930	173677	30.75	0.1225	174194	26.58	0.1500	174711	34.30
0.0345	172654	36.05	0.0655	173171	30.75	0.0940	173688	30.75	0.1230	174205	26.58	0.1505	174722	34.30
0.0355	172665	36.05	0.0660	173182	30.75	0.0945	173699	30.75	0.1235	174216	26.58	0.1510	174733	34.30
0.0365	172676	36.05	0.0665	173193	30.75	0.0950	173710	30.75	0.1245	174227	26.58	0.1515	174744	34.30
0.0375	172687	36.05	0.0675	173204	30.75	0.0955	173721	30.75	0.1247	174238	26.58	0.1525	174755	34.30
0.0385	172698	36.05	0.0680	173215	30.75	0.0965	173732	30.75	0.1255	174249	36.05	0.1530	174766	34.30
0.0395	172709	34.30	0.0685	173226	30.75	0.0970	173743	30.75	0.1265	174260	36.05	0.1535	174777	34.30
0.0405	172720	34.30	0.0690	173237	30.75	0.0975	173754	30.75	0.1270	174271	36.05	0.1545	174788	34.30
0.0415	172731	34.30	0.0695	173248	30.75	0.0985	173765	30.75	0.1275	174282	36.05	0.1550	174799	34.30
0.0425	172742	34.30	0.0705	173259	30.75	0.0990	173776	30.75	0.1280	174293	36.05	0.1555	174810	34.30
0.0435	172753	34.30	0.0710	173270	30.75	0.1000	173787	30.75	0.1290	174304	36.05	0.1560	174821	34.30
0.0440	172764	34.30	0.0715	173281	30.75	0.1005	173798	30.75	0.1295	174315	36.05	0.1565	174832	36.05
0.0445	172775	34.30	0.0720	173292	30.75	0.1010	173809	30.75	0.1300	174326	36.05	0.1580	174843	36.05
0.0450	172786	34.30	0.0725	173303	30.75	0.1020	173820	30.75	0.1305	174337	36.05	0.1585	174854	36.05
0.0455	172797	34.30	0.0735	173314	30.75	0.1025	173831	30.75	0.1310	174348	36.05	0.1595	174865	36.05
0.0460	172808	34.30	0.0740	173325	30.75	0.1030	173842	30.75	0.1315	174359	36.05	0.1600	174876	36.05
0.0470	172819	34.30	0.0745	173336	30.75	0.1035	173853	30.75	0.1320	174370	36.05	0.1605	174887	36.05
0.0475	172830	34.30	0.0750	173347	30.75	0.1045	173864	30.75	0.1325	174381	36.05	0.1615	174898	36.05
0.0480	172841	34.30	0.0755	173358	30.75	0.1050	173875	30.75	0.1330	174392	36.05	0.1620	174909	36.05
0.0485	172852	34.30	0.0765	173369	30.75	0.1055	173886	30.75	0.1335	174403	36.05	0.1625	174920	36.05

CONTINUED ON NEXT PAGE

# Chucking Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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
0.1630	174931	36.05	0.1925	175448	42.76	0.2205	175965	42.37	0.2470	176482	38.20	0.2740	176999	48.72
0.1635	174942	36.05	0.1930	175459	42.76	0.2215	175976	42.37	0.2475	176493	38.20	0.2745	177010	48.72
0.1640	174953	36.05	0.1940	175470	42.76	0.2220	175987	42.37	0.2480	176504	38.20	0.2750	177021	48.72
0.1645	174964	36.05	0.1945	175481	42.76	0.2225	175998	42.37	0.2485	176515	38.20	0.2755	177032	48.72
0.1650	174975	36.05	0.1950	175492	42.76	0.2230	176009	42.37	0.2495	176526	38.20	0.2760	177043	48.72
0.1655	174986	36.05	0.1955	175503	42.76	0.2235	176020	42.37	0.2505	176537	48.72	0.2765	177054	48.72
0.1665	174997	36.05	0.1965	175514	42.76	0.2240	176031	42.37	0.2515	176548	48.72	0.2775	177065	48.72
0.1670	175008	36.05	0.1970	175525	42.76	0.2245	176042	42.37	0.2520	176559	48.72	0.2780	177076	48.72
0.1675	175019	36.05	0.1975	175536	42.76	0.2250	176053	42.37	0.2525	176570	48.72	0.2785	177087	48.72
0.1680	175030	36.05	0.1980	175547	42.76	0.2255	176064	42.37	0.2530	176581	48.72	0.2790	177098	48.72
0.1685	175041	36.05	0.1985	175558	42.76	0.2260	176075	42.37	0.2535	176592	48.72	0.2795	177109	48.72
0.1690	175052	36.05	0.1995	175569	42.76	0.2265	176086	42.37	0.2540	176603	48.72	0.2800	177120	48.72
0.1700	175063	36.05	0.2000	175580	42.76	0.2270	176097	42.37	0.2545	176614	48.72	0.2805	177131	48.72
0.1705	175074	36.05	0.2005	175591	42.76	0.2275	176108	42.37	0.2550	176625	48.72	0.2815	177142	48.72
0.1710	175085	36.05	0.2015	175602	42.76	0.2285	176119	42.37	0.2555	176636	48.72	0.2820	177153	48.72
0.1715	175096	36.05	0.2020	175613	42.76	0.2290	176130	42.37	0.2560	176647	48.72	0.2825	177164	48.72
0.1720	175107	33.87	0.2025	175624	42.76	0.2295	176141	42.37	0.2565	176658	48.72	0.2830	177175	48.72
0.1725	175118	33.87	0.2030	175635	42.76	0.2300	176152	42.37	0.2575	176669	48.72	0.2835	177186	48.72
0.1735	175129	33.87	0.2035	175646	41.66	0.2305	176163	42.37	0.2580	176680	48.72	0.2840	177197	48.72
0.1740	175140	33.87	0.2045	175657	41.66	0.2310	176174	42.37	0.2585	176691	48.72	0.2845	177208	48.72
0.1745	175151	33.87	0.2050	175668	41.66	0.2315	176185	42.37	0.2590	176702	48.72	0.2850	177219	48.72
0.1750	175162	33.87	0.2060	175679	41.66	0.2320	176196	42.37	0.2595	176713	48.72	0.2855	177230	48.72
0.1755	175173	33.87	0.2065	175690	41.66	0.2325	176207	42.37	0.2600	176724	48.72	0.2860	177241	48.72
0.1760	175184	33.87	0.2070	175701	41.66	0.2330	176218	42.37	0.2605	176735	48.72	0.2865	177252	48.72
0.1765	175195	33.87	0.2075	175712	41.66	0.2335	176229	42.37	0.2615	176746	48.72	0.2870	177263	48.72
0.1775	175206	33.87	0.2080	175723	41.66	0.2345	176240	38.20	0.2620	176757	48.72	0.2875	177274	48.72
0.1780	175217	33.87	0.2085	175734	41.66	0.2350	176251	38.20	0.2625	176768	48.72	0.2880	177285	48.72
0.1785	175228	33.87	0.2095	175745	41.66	0.2355	176262	38.20	0.2630	176779	48.72	0.2885	177296	48.72
0.1790	175239	33.87	0.2100	175756	41.66	0.2360	176273	38.20	0.2635	176790	48.72	0.2890	177307	48.72
0.1795	175250	33.87	0.2105	175767	41.66	0.2365	176284	38.20	0.2640	176801	48.72	0.2895	177318	48.72
0.1805	175261	33.87	0.2110	175778	41.66	0.2370	176295	38.20	0.2645	176812	48.72	0.2905	177329	48.72
0.1810	175272	33.87	0.2115	175789	41.66	0.2375	176306	38.20	0.2650	176823	48.72	0.2910	177340	48.72
0.1815	175283	33.87	0.2120	175800	41.66	0.2385	176317	38.20	0.2655	176834	48.72	0.2915	177351	48.72
0.1825	175294	33.87	0.2125	175811	41.66	0.2390	176328	38.20	0.2665	176845	48.72	0.2920	177362	48.72
0.1830	175305	33.87	0.2135	175822	41.66	0.2395	176339	38.20	0.2670	176856	48.72	0.2925	177373	48.72
0.1835	175316	33.87	0.2140	175833	41.66	0.2400	176350	38.20	0.2675	176867	48.72	0.2930	177384	48.72
0.1840	175327	33.87	0.2145	175844	41.66	0.2405	176361	38.20	0.2680	176878	48.72	0.2935	177395	48.72
0.1845	175338	33.87	0.2150	175855	41.66	0.2410	176372	38.20	0.2685	176889	48.72	0.2940	177406	48.72
0.1855	175349	33.87	0.2155	175866	41.66	0.2415	176383	38.20	0.2690	176900	48.72	0.2945	177417	48.72
0.1860	175360	33.87	0.2160	175877	41.66	0.2425	176394	38.20	0.2695	176911	48.72	0.2955	177428	48.72
0.1870	175371	33.87	0.2170	175888	41.66	0.2430	176405	38.20	0.2700	176922	48.72	0.2960	177439	48.72
0.1880	175382	42.76	0.2175	175899	41.66	0.2435	176416	38.20	0.2705	176933	48.72	0.2965	177450	48.72
0.1895	175393	42.76	0.2180	175910	41.66	0.2440	176427	38.20	0.2710	176944	48.72	0.2970	177461	43.61
0.1900	175404	42.76	0.2185	175921	41.66	0.2445	176438	38.20	0.2715	176955	48.72	0.2975	177472	43.61
0.1905	175415	42.76	0.2190	175932	42.37	0.2450	176449	38.20	0.2725	176966	48.72	0.2980	177483	43.61
0.1915	175426	42.76	0.2195	175943	42.37	0.2455	176460	38.20	0.2730	176977	48.72	0.2985	177494	43.61
0.1920	175437	42.76	0.2200	175954	42.37	0.2465	176471	38.20	0.2735	176988	48.72	0.2990	177505	43.61

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HSS & COBALT REAMERS

## INTERMEDIATE SIZES - HIGH SPEED STEEL

HSS & COBALT REAMERS

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
0.2995	177516	43.61	0.3265	178033	51.37	0.3515	178550	52.11	0.3780	179067	56.20	0.4025	179584	57.64
0.3000	177527	43.61	0.3270	178044	51.37	0.3520	178561	52.11	0.3785	179078	56.20	0.4030	179595	57.64
0.3005	177538	43.61	0.3275	178055	51.37	0.3525	178572	52.11	0.3790	179089	56.20	0.4035	179606	57.64
0.3010	177549	43.61	0.3280	178066	51.37	0.3530	178583	52.11	0.3795	179100	56.20	0.4045	179617	57.64
0.3015	177560	43.61	0.3285	178077	51.37	0.3535	178594	52.11	0.3800	179111	56.20	0.4050	179628	57.64
0.3025	177571	43.61	0.3290	178088	51.37	0.3540	178605	52.11	0.3805	179122	56.20	0.4055	179639	57.64
0.3030	177582	43.61	0.3295	178099	51.37	0.3545	178616	52.11	0.3810	179133	56.20	0.4060	179650	57.64
0.3035	177593	43.61	0.3300	178110	51.37	0.3550	178627	52.11	0.3815	179144	56.20	0.4065	179661	57.64
0.3040	177604	43.61	0.3305	178121	51.37	0.3555	178638	52.11	0.3820	179155	56.20	0.4070	179672	57.64
0.3045	177615	43.61	0.3310	178132	51.37	0.3560	178649	52.11	0.3825	179166	56.20	0.4075	179683	57.64
0.3050	177626	43.61	0.3315	178143	51.37	0.3565	178660	52.11	0.3830	179177	56.20	0.4080	179694	57.64
0.3055	177637	43.61	0.3325	178154	51.37	0.3570	178671	52.11	0.3835	179188	56.20	0.4085	179705	57.64
0.3060	177648	43.61	0.3330	178165	51.37	0.3575	178682	52.11	0.3840	179199	56.20	0.4090	179716	57.64
0.3065	177659	43.61	0.3335	178176	51.37	0.3585	178693	52.11	0.3845	179210	56.20	0.4095	179727	57.64
0.3070	177670	43.61	0.3340	178187	51.37	0.3590	178704	52.11	0.3850	179221	56.20	0.4100	179738	57.64
0.3075	177681	43.61	0.3345	178198	51.37	0.3595	178715	46.69	0.3855	179232	56.20	0.4105	179749	57.64
0.3080	177692	43.61	0.3350	178209	51.37	0.3600	178726	46.69	0.3865	179243	56.20	0.4110	179760	57.64
0.3085	177703	43.61	0.3355	178220	51.37	0.3605	178737	46.69	0.3870	179254	56.20	0.4115	179771	57.64
0.3090	177714	43.61	0.3360	178231	51.37	0.3610	178748	46.69	0.3875	179265	56.20	0.4120	179782	57.64
0.3095	177725	43.61	0.3365	178242	51.37	0.3615	178759	46.69	0.3880	179276	56.20	0.4125	179793	57.64
0.3100	177736	43.61	0.3370	178253	51.37	0.3620	178770	46.69	0.3885	179287	56.20	0.4135	179804	57.64
0.3105	177747	43.61	0.3375	178264	51.37	0.3625	178781	46.69	0.3890	179298	56.20	0.4140	179815	57.64
0.3110	177758	43.61	0.3380	178275	51.37	0.3630	178792	46.69	0.3895	179309	56.20	0.4145	179826	57.64
0.3120	177769	43.61	0.3385	178286	51.37	0.3635	178803	46.69	0.3900	179320	56.20	0.4150	179837	57.64
0.3130	177780	51.37	0.3395	178297	51.37	0.3640	178814	46.69	0.3905	179331	56.20	0.4155	179848	57.64
0.3140	177791	51.37	0.3400	178308	51.37	0.3645	178825	46.69	0.3910	179342	57.64	0.4160	179859	57.64
0.3145	177802	51.37	0.3405	178319	51.37	0.3650	178836	46.69	0.3915	179353	57.64	0.4165	179870	57.64
0.3155	177813	51.37	0.3410	178330	51.37	0.3655	178847	46.69	0.3920	179364	57.64	0.4170	179881	57.64
0.3165	177824	51.37	0.3415	178341	51.37	0.3660	178858	46.69	0.3925	179375	57.64	0.4175	179892	57.64
0.3170	177835	51.37	0.3420	178352	51.37	0.3665	178869	46.69	0.3930	179386	57.64	0.4180	179903	57.64
0.3175	177846	51.37	0.3425	178363	51.37	0.3670	178880	46.69	0.3935	179397	57.64	0.4185	179914	57.64
0.3180	177857	51.37	0.3430	178374	51.37	0.3675	178891	46.69	0.3940	179408	57.64	0.4190	179925	57.64
0.3185	177868	51.37	0.3435	178385	51.37	0.3685	178902	46.69	0.3945	179419	57.64	0.4195	179936	57.64
0.3190	177879	51.37	0.3440	178396	52.11	0.3690	178913	46.69	0.3950	179430	57.64	0.4200	179947	57.64
0.3195	177890	51.37	0.3445	178407	52.11	0.3695	178924	46.69	0.3955	179441	57.64	0.4205	179958	57.64
0.3200	177901	51.37	0.3450	178418	52.11	0.3700	178935	46.69	0.3960	179452	57.64	0.4210	179969	57.64
0.3205	177912	51.37	0.3455	178429	52.11	0.3705	178946	46.69	0.3965	179463	57.64	0.4215	179980	57.64
0.3210	177923	51.37	0.3460	178440	52.11	0.3710	178957	46.69	0.3975	179474	57.64	0.4220	179991	54.06
0.3215	177934	51.37	0.3465	178451	52.11	0.3715	178968	46.69	0.3980	179485	57.64	0.4225	180002	54.06
0.3220	177945	51.37	0.3470	178462	52.11	0.3720	178979	46.69	0.3985	179496	57.64	0.4230	180013	54.06
0.3225	177956	51.37	0.3475	178473	52.11	0.3725	178990	46.69	0.3990	179507	57.64	0.4235	180024	54.06
0.3235	177967	51.37	0.3485	178484	52.11	0.3730	179001	46.69	0.3995	179518	57.64	0.4240	180035	54.06
0.3240	177978	51.37	0.3490	178495	52.11	0.3735	179012	46.69	0.4000	179529	57.64	0.4245	180046	54.06
0.3245	177989	51.37	0.3495	178506	52.11	0.3745	179023	46.69	0.4005	179540	57.64	0.4250	180057	54.06
0.3250	178000	51.37	0.3500	178517	52.11	0.3755	179034	56.20	0.4010	179551	57.64	0.4255	180068	54.06
0.3255	178011	51.37	0.3505	178528	52.11	0.3765	179045	56.20	0.4015	179562	57.64	0.4260	180079	54.06
0.3260	178022	51.37	0.3510	178539	52.11	0.3775	179056	56.20	0.4020	179573	57.64	0.4265	180090	54.06

CONTINUED ON NEXT PAGE



# Chucking Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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
0.4270	180101	54.06	0.4525	180629	61.31	0.4765	181157	61.31	0.5020	181685	77.56	0.7525	182202	124.41
0.4275	180112	54.06	0.4530	180640	61.31	0.4770	181168	61.31	0.5025	181696	77.56	0.7530	182213	124.41
0.4280	180123	54.06	0.4535	180651	61.31	0.4775	181179	61.31	0.5030	181707	77.56	0.7540	182224	124.41
0.4285	180134	54.06	0.4540	180662	61.31	0.4780	181190	61.31	0.5035	181718	77.56	0.7550	182235	124.41
0.4290	180145	54.06	0.4545	180673	61.31	0.4785	181201	61.31	0.5040	181729	77.56	0.8095	182246	124.41
0.4295	180156	54.06	0.4550	180684	61.31	0.4790	181212	61.31	0.5045	181740	77.56	0.8100	182257	124.41
0.4300	180167	54.06	0.4555	180695	61.31	0.4795	181223	61.31	0.5050	181751	77.56	0.8105	182268	124.41
0.4305	180178	54.06	0.4560	180706	61.31	0.4800	181234	61.31	0.5060	181762	77.56	0.8110	182279	124.41
0.4310	180189	54.06	0.4565	180717	61.31	0.4805	181245	61.31	0.5070	181773	77.56	0.8120	182290	124.41
0.4315	180200	54.06	0.4570	180728	61.31	0.4810	181256	61.31	0.5080	181784	77.56	0.8130	182301	137.00
0.4320	180211	54.06	0.4575	180739	61.31	0.4815	181267	61.31	0.5090	181795	77.56	0.8140	182312	137.00
0.4325	180222	54.06	0.4580	180750	61.31	0.4820	181278	61.31	0.5100	181806	77.56	0.8145	182323	137.00
0.4330	180233	54.06	0.4585	180761	61.31	0.4825	181289	61.31	0.5600	181817	75.96	0.8150	182334	137.00
0.4335	180244	54.06	0.4590	180772	61.31	0.4830	181300	61.31	0.5605	181828	75.96	0.8155	182345	137.00
0.4340	180255	54.06	0.4595	180783	61.31	0.4835	181311	61.31	0.5610	181839	75.96	0.8720	182356	140.54
0.4345	180266	54.06	0.4600	180794	61.31	0.4840	181322	61.31	0.5620	181850	75.96	0.8725	182367	140.54
0.4350	180277	54.06	0.4605	180805	61.31	0.4845	181333	57.64	0.5630	181861	87.23	0.8730	182378	140.54
0.4355	180288	54.06	0.4610	180816	61.31	0.4850	181344	57.64	0.5640	181872	87.23	0.8735	182389	140.54
0.4360	180299	54.06	0.4615	180827	61.31	0.4855	181355	57.64	0.5645	181883	87.23	0.8745	182400	140.54
0.4370	180310	54.06	0.4620	180838	61.31	0.4860	181366	57.64	0.5650	181894	87.23	0.8755	182411	153.13
0.4380	180321	61.31	0.4625	180849	61.31	0.4865	181377	57.64	0.5655	181905	87.23	0.8765	182422	153.13
0.4390	180332	61.31	0.4630	180860	61.31	0.4870	181388	57.64	0.6220	181916	87.62	0.8770	182433	153.13
0.4395	180343	61.31	0.4635	180871	61.31	0.4875	181399	57.64	0.6225	181927	87.62	0.8775	182444	153.13
0.4400	180354	61.31	0.4640	180882	61.31	0.4880	181410	57.64	0.6230	181938	87.62	0.8780	182455	153.13
0.4405	180365	61.31	0.4645	180893	61.31	0.4885	181421	57.64	0.6235	181949	87.62	0.9340	182466	153.13
0.4410	180376	61.31	0.4650	180904	61.31	0.4890	181432	57.64	0.6245	181960	87.62	0.9345	182477	153.13
0.4415	180387	61.31	0.4655	180915	61.31	0.4895	181443	57.64	0.6255	181971	97.87	0.9350	182488	153.13
0.4420	180398	61.31	0.4660	180926	61.31	0.4900	181454	57.64	0.6265	181982	97.87	0.9355	182499	153.13
0.4425	180409	61.31	0.4665	180937	61.31	0.4905	181465	57.64	0.6270	181993	97.87	0.9360	182510	153.13
0.4430	180420	61.31	0.4670	180948	61.31	0.4910	181476	57.64	0.6275	182004	97.87	0.9370	182521	153.13
0.4435	180431	61.31	0.4675	180959	61.31	0.4915	181487	57.64	0.6280	182015	97.87	0.9380	182532	168.10
0.4440	180442	61.31	0.4680	180970	61.31	0.4920	181498	57.64	0.6300	182697	97.87	0.9390	182543	168.10
0.4445	180453	61.31	0.4685	180981	61.31	0.4925	181509	57.64	0.6845	182026	97.87	0.9395	182554	168.10
0.4450	180464	61.31	0.4690	180992	61.31	0.4930	181520	57.64	0.6850	182037	97.87	0.9400	182565	168.10
0.4455	180475	61.31	0.4695	181003	61.31	0.4935	181531	57.64	0.6855	182048	97.87	0.9405	182576	168.10
0.4460	180486	61.31	0.4700	181014	61.31	0.4940	181542	57.64	0.6860	182059	97.87	0.9970	182587	171.34
0.4465	180497	61.31	0.4705	181025	61.31	0.4945	181553	57.64	0.6870	182070	97.87	0.9975	182598	171.34
0.4470	180508	61.31	0.4710	181036	61.31	0.4950	181564	57.64	0.6880	182081	107.88	0.9980	182609	171.34
0.4475	180519	61.31	0.4715	181047	61.31	0.4955	181575	57.64	0.6895	182092	107.88	0.9985	182620	171.34
0.4480	180530	61.31	0.4720	181058	61.31	0.4960	181586	57.64	0.6900	182103	107.88	0.9995	182631	171.34
0.4485	180541	61.31	0.4725	181069	61.31	0.4965	181597	57.64	0.6905	182114	107.88	1.0005	182642	237.98
0.4490	180552	61.31	0.4730	181080	61.31	0.4970	181608	57.64	0.7470	182125	114.63	1.0015	182653	237.98
0.4495	180563	61.31	0.4735	181091	61.31	0.4975	181619	57.64	0.7475	182136	114.63	1.0020	182664	237.98
0.4500	180574	61.31	0.4740	181102	61.31	0.4980	181630	57.64	0.7485	182147	114.63	1.0025	182675	237.98
0.4505	180585	61.31	0.4745	181113	61.31	0.4985	181641	57.64	0.7495	182158	114.63	1.0030	182686	237.98
0.4510	180596	61.31	0.4750	181124	61.31	0.4995	181652	57.64	0.7505	182169	124.41	-	-	-
0.4515	180607	61.31	0.4755	181135	61.31	0.5005	181663	77.56	0.7515	182180	124.41	-	-	-
0.4520	180618	61.31	0.4760	181146	61.31	0.5015	181674	77.56	0.7520	182191	124.41	-	-	-

HSS & COBALT 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+
.0135 - .0195	209.86	137.14	102.19	67.44	60.92	51.78	46.85	43.58	42.44	38.89	37.71	37.22	36.34
.0196 - .0290	190.80	124.68	92.97	61.30	55.36	48.53	42.58	39.68	36.79	35.31	35.16	35.10	34.98
.0291 - .0390	173.44	113.15	84.48	55.68	50.31	44.16	38.75	36.05	33.41	32.12	31.21	30.77	30.04
.0391 - .0624	156.77	104.37	84.48	53.71	48.42	41.96	36.92	34.30	31.64	29.69	29.23	29.12	28.93
.0626 - .1093	165.06	105.66	81.48	50.77	44.50	36.90	33.41	30.75	28.17	26.58	25.94	25.47	24.60
.1095 - .1249	162.88	103.38	76.59	44.37	38.96	35.65	29.23	26.58	26.20	25.77	25.34	24.87	24.68
.1251 - .1405	173.44	113.15	76.39	55.68	52.44	44.16	38.75	36.05	33.41	32.12	31.30	30.77	29.74
.1407 - .1561	170.81	111.36	84.57	53.99	48.42	42.29	36.92	34.30	32.38	31.64	30.92	30.19	29.43
.1563 - .1718	173.44	108.24	84.08	55.68	50.43	44.16	38.75	36.05	33.41	32.89	32.38	32.12	31.49
.1720 - .1874	166.34	103.83	84.03	51.87	46.61	41.66	36.65	33.87	33.51	33.00	32.53	31.70	31.30
.1876 - .2030	178.11	118.66	93.12	62.33	57.02	50.68	45.33	42.75	39.84	37.71	36.90	36.65	36.35
.2032 - .2187	178.11	118.66	92.12	61.37	56.08	49.64	44.23	41.67	38.96	36.65	36.19	35.76	35.58
.2189 - .2343	178.83	119.60	92.87	62.15	56.81	50.43	45.03	42.36	39.74	38.14	37.57	37.22	36.92
.2345 - .2499	178.83	119.60	88.40	57.67	52.29	46.13	40.86	38.19	35.36	35.16	34.69	34.32	34.18
.2501 - .2968	185.73	126.27	99.47	68.75	63.47	56.70	51.37	48.72	45.90	43.51	43.09	42.71	42.29
.2970 - .3124	180.57	121.16	94.35	63.51	58.18	51.78	46.33	43.61	43.43	43.05	42.84	42.55	42.29
.3126 - .3437	189.69	129.31	102.36	66.30	64.28	59.31	54.14	51.37	48.48	46.37	45.90	45.59	45.22
.3439 - .3593	189.42	130.01	103.13	72.36	66.99	62.88	54.14	52.11	49.46	47.09	46.61	46.24	45.90
.3595 - .3749	183.98	124.39	97.59	66.64	61.37	54.88	49.58	46.69	46.44	46.37	46.05	45.82	45.66
.3751 - .3905	192.58	133.22	106.58	75.52	70.20	64.35	58.87	56.20	53.60	50.77	50.49	50.07	49.64
.3907 - .4218	195.00	135.52	108.64	77.89	72.57	65.56	60.26	57.65	54.92	52.52	52.02	51.78	51.64
.4220 - .4374	191.32	131.97	104.96	74.32	69.03	62.15	56.70	54.05	53.60	53.42	53.19	52.09	51.52
.4376 - .4843	200.18	140.67	113.86	83.12	77.79	70.50	62.57	61.30	59.96	58.09	57.67	57.02	56.51
.4845 - .4999	195.47	136.01	109.15	78.28	73.09	65.85	57.82	57.65	57.18	56.96	56.51	56.31	56.13
.5001 - .5311	283.65	176.18	140.45	104.48	95.64	86.58	80.68	77.56	74.57	73.20	72.26	71.67	70.97
.5313 - .5624	282.06	174.53	138.73	102.82	93.98	84.90	79.08	75.98	72.91	71.43	70.54	69.88	69.56
.5626 - .5937	293.16	185.62	149.75	113.86	107.04	96.03	92.90	87.22	84.03	82.67	81.70	81.10	80.27
.5939 - .6249	293.57	185.92	150.09	114.21	105.37	96.41	90.45	87.61	84.38	83.03	82.02	81.48	81.13
.6251 - .6874	304.04	196.51	160.65	124.77	115.82	111.16	100.85	97.87	94.93	93.39	92.49	91.99	91.70
.6876 - .7187	313.88	206.44	170.54	134.23	125.48	116.71	110.80	107.89	104.93	103.38	102.40	101.68	101.10
.7189 - .7499	317.84	210.32	174.66	138.65	129.87	120.84	114.78	114.63	114.50	114.40	113.98	113.75	113.37
.7501 - .8124	330.37	222.92	187.22	151.25	142.34	133.41	127.42	124.41	121.43	119.95	119.08	118.39	117.59
.8126 - .8437	343.04	235.45	199.79	163.86	154.90	146.07	139.99	137.00	134.07	132.51	131.54	131.02	130.27
.8439 - .8749	346.22	238.71	202.80	166.91	158.00	149.09	143.02	140.54	139.23	135.52	134.56	133.99	131.45
.8751 - .9374	359.23	251.69	215.86	179.97	171.09	162.25	156.12	153.14	150.24	149.78	149.52	149.30	149.02
.9376 - .9687	374.15	265.03	230.81	195.00	186.06	177.12	171.09	168.09	165.15	163.77	162.66	162.31	161.41
.9689 - .9999	377.25	269.76	233.95	198.00	189.17	180.19	174.27	171.34	168.20	166.79	165.82	165.15	164.48
1.0001 - 1.0624	404.86	302.42	291.71	281.01	270.19	259.48	248.73	237.98	227.30	225.89	220.72	218.91	217.06
1.0626 - 1.1249	427.54	325.64	313.88	302.07	290.27	278.49	266.76	254.99	243.22	231.47	230.38	229.23	227.93
1.1251 - 1.1874	456.57	356.15	343.93	332.25	320.53	308.84	297.49	285.47	275.91	262.03	250.32	238.67	226.94
1.1876 - 1.2499	481.96	380.10	367.33	354.69	342.03	329.39	316.70	304.04	291.39	278.75	266.08	253.40	240.77
1.2501 - 1.3749	548.22	441.54	427.76	414.28	400.83	385.33	373.89	360.50	346.95	333.48	330.02	326.58	323.76
1.3751 - 1.4999	606.44	503.20	488.16	473.19	458.14	443.10	428.17	413.09	398.13	383.06	378.98	373.42	367.05

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



# Chucking Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## STRAIGHT SHANK - STRAIGHT FLUTE



M42 COBALT

### SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0135 - .0195	303.15	160.26	118.79	77.53	67.19	56.79	49.94	46.47	43.02	41.32	40.31	38.89	38.75
.0196 - .0290	275.63	145.61	107.99	70.48	61.08	51.64	45.33	42.23	39.14	38.96	38.91	38.89	38.75
.0291 - .0390	250.59	132.47	98.21	64.01	55.48	49.63	41.23	38.43	35.58	34.18	33.34	32.72	31.96
.0391 - .0624	228.14	130.46	96.25	62.00	53.45	44.91	39.26	36.40	33.54	32.13	31.94	31.68	31.40
.0626 - .1093	229.71	127.54	93.33	59.10	50.62	41.97	36.34	33.47	30.61	29.23	29.06	28.93	28.69
.1095 - .1249	224.46	122.22	88.10	53.87	45.32	36.81	31.11	29.42	27.75	27.27	26.88	26.53	26.22
.1251 - .1405	234.61	132.41	97.81	64.01	55.48	46.96	41.23	38.43	35.58	34.18	33.34	32.72	31.96
.1407 - .1561	232.67	130.46	96.25	62.00	53.45	44.91	39.26	36.40	33.54	32.13	31.70	31.59	31.36
.1563 - .1718	234.82	132.51	98.31	64.18	55.65	47.09	41.43	38.56	35.68	34.24	33.99	33.75	33.47
.1720 - .1874	233.10	130.96	96.69	62.57	55.47	45.48	39.75	36.92	34.06	33.99	33.79	33.54	33.53
.1876 - .2030	242.66	140.45	106.16	72.02	63.50	54.88	49.27	46.39	43.52	42.09	41.23	40.70	40.48
.2032 - .2343	241.63	139.47	105.28	71.05	62.57	54.05	48.29	46.80	45.29	44.81	44.53	44.16	43.47
.2345 - .2499	237.48	135.52	101.34	67.19	58.59	50.05	44.37	44.11	43.82	43.47	43.06	42.29	41.75
.2501 - .2968	258.65	156.48	122.16	88.10	79.50	70.99	65.15	62.38	59.57	58.14	57.71	56.87	56.70
.2970 - .3124	252.14	149.86	115.67	81.48	72.87	64.37	58.74	58.37	58.01	57.74	57.25	57.17	56.77
.3126 - .3437	261.86	159.57	125.35	91.20	82.67	74.07	68.42	65.55	62.65	62.41	62.06	61.47	61.14
.3439 - .3593	262.32	160.14	125.92	91.74	83.22	74.72	68.94	66.17	63.37	62.92	62.55	62.41	62.00
.3595 - .3749	256.33	154.09	119.90	85.65	77.12	68.57	62.88	62.72	62.55	62.33	31.30	62.19	61.94
.3751 - .3905	279.98	177.81	143.63	109.43	100.85	92.34	86.39	83.67	80.94	79.50	78.62	78.10	77.37
.3907 - .4218	283.56	181.45	147.17	112.99	104.49	95.91	90.21	87.38	84.55	83.22	82.17	81.66	80.94
.4220 - .4374	278.00	175.79	141.61	107.40	98.91	90.33	84.59	81.78	78.91	77.56	76.66	76.11	75.41
.4376 - .4843	291.50	189.35	155.13	120.96	112.43	103.85	98.27	95.41	92.54	91.08	90.21	89.67	88.92
.4845 - .4999	284.15	181.90	147.74	113.53	104.93	96.44	90.78	89.24	87.68	87.44	87.13	86.95	86.80
.5001 - .5311	299.83	196.15	162.31	125.34	121.86	118.60	115.38	112.15	108.90	105.67	102.40	99.17	95.98
.5313 - .5624	302.07	199.45	166.78	129.35	125.54	121.86	118.22	114.58	110.93	107.30	103.65	100.01	96.35
.5626 - .5937	307.80	204.59	170.95	133.32	129.16	125.09	121.04	127.27	112.96	108.90	104.85	100.79	96.71
.5939 - .6249	317.53	214.85	182.20	144.46	140.58	137.00	133.41	129.82	126.24	122.56	118.99	115.38	111.79
.6251 - .6874	327.63	224.55	193.58	155.64	152.13	148.83	145.53	142.22	138.89	135.63	133.60	128.94	125.71
.6876 - .7187	337.58	234.37	201.34	163.21	160.38	157.72	154.90	152.32	149.75	147.13	144.46	143.63	143.37
.7189 - .7499	349.50	247.41	216.64	178.20	174.04	169.92	165.86	161.81	157.72	153.63	149.52	145.46	141.33
.7501 - .8124	367.95	265.02	232.90	195.76	183.51	179.59	175.63	171.71	167.81	163.86	159.89	155.98	152.06
.8126 - .8437	386.47	284.66	250.96	216.31	206.05	202.52	199.15	195.76	192.32	188.86	185.44	182.06	178.65
.8439 - .8749	406.56	303.54	270.46	233.99	220.36	215.71	211.17	206.63	202.06	197.52	192.92	188.43	183.86
.8751 - .9374	422.78	319.36	286.65	248.46	234.61	229.95	225.38	220.76	216.16	211.58	206.93	204.92	202.79
.9376 - .9687	444.45	338.87	306.56	269.35	263.73	258.73	253.40	248.17	242.84	237.52	232.26	229.61	227.13
.9689 - .9999	459.91	357.01	325.34	288.95	281.73	274.62	267.56	260.55	253.54	246.55	239.52	232.45	225.42
1.0001 - 1.0624	494.88	391.84	358.40	321.21	313.32	306.06	297.45	289.58	281.69	273.76	265.85	257.88	250.06
1.0626 - 1.1249	530.16	427.53	394.75	358.42	348.01	337.97	327.85	317.79	307.66	297.65	287.56	277.48	267.42
1.1251 - 1.1874	564.35	459.91	430.10	390.18	381.13	372.25	363.44	354.55	345.71	336.80	327.90	319.10	310.17
1.1876 - 1.2499	600.12	499.04	466.82	427.91	416.41	405.62	394.76	384.02	373.28	362.48	351.71	340.89	330.18
1.2501 - 1.3749	636.16	531.33	496.71	461.41	454.41	440.51	440.40	433.43	426.43	419.43	412.44	411.99	411.04
1.3751 - 1.4999	671.46	568.21	536.01	498.65	493.72	489.11	484.46	481.51	478.56	477.55	476.72	475.57	474.62

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

MADE IN USA

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



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
1.0mm	.0394	1/2	4	2-1/2	.0394	188252	33.71	190188	36.87
#60	.0400	1/2	4	2-1/2	.0390	188263	33.71	190199	36.87
#59	.0410	1/2	4	2-1/2	.0390	188274	33.71	190210	36.87
#58	.0420	1/2	4	2-1/2	.0390	188285	33.71	190221	36.87
#57	.0430	1/2	4	2-1/2	.0390	188296	33.71	190232	36.87
#56	.0465	1/2	4	2-1/2	.0455	188307	33.71	190243	36.87
3/64	.0469	1/2	4	2-1/2	.0455	188318	33.71	190254	36.87
#55	.0520	1/2	4	2-1/2	.0510	188329	33.71	190265	36.87
#54	.0550	1/2	4	2-1/2	.0510	188340	33.71	190276	36.87
1.5mm	.0591	1/2	4	2-1/2	.0510	188351	33.71	190287	36.87
#53	.0595	1/2	4	2-1/2	.0585	188362	33.71	190298	36.87
1/16	.0625	1/2	4	2-1/2	.0585	188373	33.71	190309	36.87
#52	.0635	1/2	4	2-1/2	.0585	188384	33.71	190320	36.87
#51	.0670	3/4	4	3	.0660	188395	27.13	190331	29.70
#50	.0700	3/4	4	3	.0660	188406	27.13	190342	29.70
#49	.0730	3/4	4	3	.0660	188417	27.13	190353	29.70
#48	.0760	3/4	4	3	.0720	188428	27.13	190364	29.70
5/64	.0781	3/4	4	3	.0720	188439	27.13	190375	29.70
#47	.0785	3/4	4	3	.0720	188450	27.13	190386	29.70
2.0mm	.0787	3/4	4	3	.0720	188461	27.13	190397	29.70
#46	.0810	3/4	4	3	.0771	188472	27.13	190408	29.70
#45	.0820	3/4	4	3	.0771	188483	27.13	190419	29.70
#44	.0860	3/4	4	3	.0810	188494	27.13	190430	29.70
#43	.0890	3/4	4	3	.0810	188505	27.13	190441	29.70
#42	.0935	3/4	4	3	.0880	188516	27.13	190452	29.70
3/32	.0938	3/4	4	3	.0880	188527	26.89	190463	29.70
#41	.0960	7/8	4	3-1/2	.0928	188538	27.32	190474	29.97
#40	.0980	7/8	4	3-1/2	.0928	188549	27.32	190485	29.97
2.5mm	.0984	7/8	4	3-1/2	.0928	188560	27.32	190496	29.97
#39	.0995	7/8	4	3-1/2	.0928	188571	27.32	190507	29.97
#38	.1015	7/8	4	3-1/2	.0950	188582	27.32	190518	29.97
#37	.1040	7/8	4	3-1/2	.0950	188593	27.32	190529	29.97
#36	.1065	7/8	4	3-1/2	.1030	188604	27.32	190540	29.97
7/64	.1094	7/8	4	3-1/2	.1030	188615	28.14	190551	30.91
#35	.1100	7/8	4	3-1/2	.1030	188626	28.14	190562	30.91
#34	.1110	7/8	4	3-1/2	.1055	188637	28.14	190573	30.91
#33	.1130	7/8	4	3-1/2	.1055	188648	28.14	190584	30.91
#32	.1160	7/8	4	3-1/2	.1120	188659	28.14	190595	30.91
3.0mm	.1181	7/8	4	3-1/2	.1120	188670	28.14	190606	30.91
#31	.1200	7/8	4	3-1/2	.1120	188681	28.14	190617	30.91
o/u	.1240	7/8	4	3-1/2	.1190	188692	28.14	190628	30.91
1/8	.1250	7/8	4	3-1/2	.1190	188703	25.37	190639	27.79
o/u	.1260	7/8	4	3-1/2	.1190	188714	28.14	190650	30.91
#30	.1285	7/8	4	3-1/2	.1190	188725	28.14	190661	30.91
#29	.1360	1	4	4	.1275	188736	33.71	190672	36.91
3.5mm	.1378	1	4	4	.1350	188747	33.71	190683	36.91

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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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#28	.1405	1	4	4	.1350	188758	33.71	190694	36.91
9/64	.1406	1	4	4	.1350	188769	33.71	190705	36.91
#27	.1440	1	4	4	.1350	188780	33.71	190716	36.91
#26	.1470	1	4	4	.1430	188791	33.71	190727	36.91
#25	.1495	1	4	4	.1430	188802	33.71	190738	36.91
#24	.1520	1	4	4	.1460	188813	35.08	190749	36.91
#23	.1540	1	4	4	.1460	188824	35.08	190760	36.91
5/32	.1562	1	4	4	.1510	188835	35.08	190771	36.91
#22	.1570	1	6	4	.1510	188846	35.08	190782	36.91
4.0mm	.1575	1	6	4	.1510	188857	35.08	190793	36.91
#21	.1590	1-1/8	6	4-1/2	.1530	188868	35.97	190804	39.40
#20	.1610	1-1/8	6	4-1/2	.1530	188879	35.97	190815	39.40
#19	.1660	1-1/8	6	4-1/2	.1595	188890	35.97	190826	39.40
#18	.1695	1-1/8	6	4-1/2	.1595	188901	35.97	190837	39.40
11/64	.1719	1-1/8	6	4-1/2	.1645	188912	35.97	190848	39.40
#17	.1730	1-1/8	6	4-1/2	.1645	188923	35.97	190859	39.40
#16	.1770	1-1/8	6	4-1/2	.1704	188934	35.97	190870	39.40
4.5mm	.1772	1-1/8	6	4-1/2	.1704	188945	35.97	190881	39.40
#15	.1800	1-1/8	6	4-1/2	.1755	188956	35.97	190892	39.40
#14	.1820	1-1/8	6	4-1/2	.1755	188967	35.97	190903	39.40
#13	.1850	1-1/8	6	4-1/2	.1805	188978	35.97	190914	39.40
o/u	.1865	1-1/8	6	4-1/2	.1805	188989	35.97	190925	39.40
3/16	.1875	1-1/8	6	4-1/2	.1805	189000	34.18	190936	37.42
o/u	.1885	1-1/8	6	4-1/2	.1805	189011	35.97	190947	39.40
#12	.1890	1-1/8	6	4-1/2	.1805	189022	35.97	190958	39.40
#11	.1910	1-1/4	6	5	.1860	189033	40.30	190969	44.16
#10	.1935	1-1/4	6	5	.1860	189044	40.30	190980	44.16
#9	.1960	1-1/4	6	5	.1895	189055	40.30	190991	44.16
5.0mm	.1969	1-1/4	6	5	.1895	189066	40.30	191002	44.16
#8	.1990	1-1/4	6	5	.1895	189077	40.30	191013	44.16
#7	.2010	1-1/4	6	5	.1895	189088	40.30	191024	44.16
13/64	.2031	1-1/4	6	5	.1945	189099	40.30	191035	44.16
#6	.2040	1-1/4	6	5	.1945	189110	40.30	191046	44.16
#5	.2055	1-1/4	6	5	.2016	189121	40.30	191057	44.16
#4	.2090	1-1/4	6	5	.2016	189132	40.30	191068	44.16
#3	.2130	1-1/4	6	5	.2075	189143	40.30	191079	44.16
5.5mm	.2165	1-1/4	6	5	.2075	189154	40.30	191090	44.16
7/32	.2188	1-1/4	6	5	.2075	189165	40.30	191101	44.16
#2	.2210	1-1/2	6	6	.2173	189176	41.43	191112	45.41
#1	.2280	1-1/2	6	6	.2173	189187	41.43	191123	45.41
A	.2340	1-1/2	6	6	.2265	189198	41.43	191134	45.41
15/64	.2344	1-1/2	6	6	.2265	189209	41.43	191145	45.41
6.0mm	.2362	1-1/2	6	6	.2265	189220	41.70	191156	47.78
B	.2380	1-1/2	6	6	.2329	189231	41.70	191167	47.78
C	.2420	1-1/2	6	6	.2329	189242	41.70	191178	47.78
D	.2460	1-1/2	6	6	.2329	189253	41.70	191189	43.46

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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

MADE IN USA

181

HSS & COBALT REAMERS

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



HSS & COBALT REAMERS

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
<b>o/u</b>	.2490	1-1/2	6	6	.2405	<b>189264</b>	44.51	<b>191200</b>	51.17
<b>1/4</b>	.2500	1-1/2	6	6	.2405	<b>189275</b>	35.51	<b>191211</b>	40.61
<b>o/u</b>	.2510	1-1/2	6	6	.2405	<b>189286</b>	44.51	<b>191222</b>	51.17
<b>6.5mm</b>	.2559	1-1/2	6	6	.2405	<b>189297</b>	41.70	<b>191233</b>	47.78
<b>F</b>	.2570	1-1/2	6	6	.2485	<b>189308</b>	41.70	<b>191244</b>	47.78
<b>G</b>	.2610	1-1/2	6	6	.2485	<b>189319</b>	41.70	<b>191255</b>	47.78
<b>17/64</b>	.2656	1-1/2	6	6	.2485	<b>189330</b>	46.54	<b>191266</b>	59.01
<b>H</b>	.2660	1-1/2	6	6	.2485	<b>189341</b>	46.54	<b>191277</b>	59.01
<b>I</b>	.2720	1-1/2	6	6	.2485	<b>189352</b>	46.54	<b>191288</b>	59.01
<b>7.0mm</b>	.2756	1-1/2	6	6	.2485	<b>189363</b>	46.54	<b>191299</b>	59.01
<b>J</b>	.2770	1-1/2	6	6	.2485	<b>189374</b>	46.54	<b>191310</b>	59.01
<b>K</b>	.2810	1-1/2	6	6	.2485	<b>189385</b>	46.54	<b>191321</b>	59.01
<b>9/32</b>	.2812	1-1/2	6	6	.2485	<b>189396</b>	44.16	<b>191332</b>	56.09
<b>L</b>	.2900	1-1/2	6	6	.2792	<b>189407</b>	46.54	<b>191343</b>	59.01
<b>M</b>	.2950	1-1/2	6	6	.2792	<b>189418</b>	46.54	<b>191354</b>	59.01
<b>7.5mm</b>	.2953	1-1/2	6	6	.2792	<b>189429</b>	46.54	<b>191365</b>	59.01
<b>19/64</b>	.2969	1-1/2	6	6	.2792	<b>189440</b>	46.54	<b>191376</b>	59.01
<b>N</b>	.3020	1-1/2	6	6	.2792	<b>189451</b>	46.54	<b>191387</b>	59.01
<b>o/u</b>	.3115	1-1/2	6	6	.2792	<b>189462</b>	44.16	<b>191398</b>	56.09
<b>5/16</b>	.3125	1-1/2	6	6	.2792	<b>189473</b>	41.86	<b>191409</b>	53.12
<b>o/u</b>	.3135	1-1/2	6	6	.2792	<b>189484</b>	44.16	<b>191420</b>	56.09
<b>8.0mm</b>	.3150	1-1/2	6	6	.2792	<b>189495</b>	46.54	<b>191431</b>	59.01
<b>O</b>	.3160	1-1/2	6	6	.2792	<b>189506</b>	46.54	<b>191442</b>	59.01
<b>P</b>	.3230	1-1/2	6	6	.2792	<b>189517</b>	49.77	<b>191453</b>	63.57
<b>21/64</b>	.3281	1-1/2	6	6	.2792	<b>189528</b>	49.77	<b>191464</b>	63.57
<b>Q</b>	.3320	1-1/2	6	6	.2792	<b>189539</b>	49.77	<b>191475</b>	63.57
<b>8.5mm</b>	.3346	1-1/2	6	6	.2792	<b>189550</b>	49.77	<b>191486</b>	63.57
<b>R</b>	.3390	1-1/2	6	6	.2792	<b>189561</b>	49.77	<b>191497</b>	63.57
<b>11/32</b>	.3438	1-1/2	6	6	.2792	<b>189572</b>	49.77	<b>191508</b>	63.57
<b>S</b>	.3480	1-3/4	6	6	.3105	<b>189583</b>	50.20	<b>191519</b>	64.43
<b>9.0mm</b>	.3543	1-3/4	6	7	.3105	<b>189594</b>	50.20	<b>191530</b>	64.43
<b>T</b>	.3580	1-3/4	6	7	.3105	<b>189605</b>	50.20	<b>191541</b>	64.43
<b>23/64</b>	.3594	1-3/4	6	7	.3105	<b>189616</b>	50.20	<b>191552</b>	64.43
<b>U</b>	.3680	1-3/4	6	7	.3105	<b>189627</b>	50.20	<b>191563</b>	64.43
<b>9.5mm-o/u</b>	.3740	1-3/4	6	7	.3105	<b>189638</b>	47.71	<b>191574</b>	61.15
<b>3/8</b>	.3750	1-3/4	6	7	.3105	<b>189649</b>	45.21	<b>191585</b>	58.00
<b>o/u</b>	.3760	1-3/4	6	7	.3105	<b>189660</b>	47.71	<b>191596</b>	61.15
<b>V</b>	.3770	1-3/4	6	7	.3105	<b>189671</b>	54.64	<b>191607</b>	81.15
<b>W</b>	.3860	1-3/4	6	7	.3105	<b>189682</b>	54.64	<b>191618</b>	81.15
<b>25/64</b>	.3906	1-3/4	6	7	.3105	<b>189693</b>	54.64	<b>191629</b>	81.15
<b>10.0mm</b>	.3937	1-3/4	6	7	.3105	<b>189704</b>	54.64	<b>191640</b>	81.15
<b>X</b>	.3970	1-3/4	6	7	.3105	<b>189715</b>	54.64	<b>191651</b>	81.15
<b>Y</b>	.4040	1-3/4	6	7	.3105	<b>189726</b>	56.67	<b>191662</b>	81.15
<b>13/32</b>	.4062	1-3/4	6	7	.3105	<b>189737</b>	56.67	<b>191673</b>	81.15
<b>Z</b>	.4130	1-3/4	6	7	.3730	<b>189748</b>	56.67	<b>191684</b>	81.15
<b>10.5mm</b>	.4134	1-3/4	6	7	.3730	<b>189759</b>	56.67	<b>191695</b>	81.15

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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

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

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



SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
27/64	.4219	1-3/4	6	7	.3730	189770	56.67	191706	81.15
11.0mm	.4331	1-3/4	6	7	.3730	189781	56.67	191717	81.15
o/u	.4365	1-3/4	6	7	.3730	189792	56.67	191728	81.15
7/16	.4375	1-3/4	6	7	.3730	189803	53.82	191739	77.05
o/u	.4385	1-3/4	6	7	.3730	189814	56.67	191750	81.15
11.5mm	.4528	1-3/4	6	7	.3730	189825	61.78	191761	92.99
29/64	.4531	1-3/4	6	7	.3730	189836	61.78	191772	92.99
15/32	.4688	1-3/4	6	7	.3730	189847	61.78	191783	92.99
12.0mm	.4724	2	6	8	.4355	189858	61.78	191794	92.99
31/64	.4844	2	6	8	.4355	189869	61.78	191805	92.99
12.5mm	.4921	2	6	8	.4355	189880	61.78	191816	92.99
o/u	.4990	2	6	8	.4355	189891	61.78	191827	92.99
1/2	.5000	2	6	8	.4355	189902	58.58	191838	88.32
o/u	.5010	2	6	8	.4355	189913	61.78	191849	92.99
17/32	.5312	2	6	8	.4355	189924	72.84	191860	104.34
9/16	.5625	2	8	8	.4355	189935	72.84	191871	104.34
19/32	.5938	2	8	8	.4355	189946	72.84	191882	104.34
5/8	.6250	2-1/4	8	9	.5615	189957	85.01	191893	121.72
21/32	.6562	2-1/4	8	9	.5615	189968	89.41	191904	137.62
11/16	.6875	2-1/4	8	9	.5615	189979	96.11	191915	137.62
23/32	.7188	2-1/4	8	9	.5615	189990	107.30	191926	153.56
3/4	.7500	2-1/2	8	9-1/2	.6240	190001	107.30	191937	154.42
25/32	.7812	2-1/2	8	9-1/2	.6240	190012	116.30	191948	166.62
13/16	.8125	2-1/2	8	9-1/2	.6240	190023	116.30	191959	166.62
27/32	.8438	2-1/2	8	9-1/2	.6240	190034	137.66	191970	197.14
7/8	.8750	2-5/8	8	10	.7490	190045	140.82	191981	201.70
29/32	.9062	2-5/8	8	10	.7490	190056	151.81	191992	217.33
15/16	.9375	2-5/8	8	10	.7490	190067	151.81	192003	217.33
31/32	.9688	2-5/8	8	10	.7490	190078	169.97	192014	243.40
1	1.0000	2-3/4	8	10-1/2	.8740	190089	171.61	192025	245.35
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	190100	190.24	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	190111	202.16	-	-
1-3/16	1.1875	2-7/8	8	11	.9990	190122	236.74	-	-
1-1/4	1.2500	3	8	11-1/2	.9990	190133	250.92	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	190144	292.70	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	190155	307.63	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	190166	329.85	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	190177	355.10	-	-
1-9/16	1.5625	3-1/2	12	13	1.2490	192036	502.94	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192047	502.94	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192058	577.50	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192069	577.50	-	-
1-13/16	1.8125	4	12	14	1.4990	192080	665.11	-	-
1-7/8	1.8750	4	12	14	1.4990	192091	665.11	-	-
1-15/16	1.9375	4	12	14	1.4990	192102	778.65	-	-
2	2.0000	4	12	14	1.4990	192113	778.65	-	-

HSS & COBALT REAMERS

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, +.0004	+0.0002, +.0006

MADE IN USA

183



## 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	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	7/8	4	3-1/2	.1190	185601	24.55	188098	25.41	192212	28.14	192366	29.35
.1247	7/8	4	3-1/2	.1190	185612	24.55	188109	25.41	192223	28.14	192377	29.35
.1855	1-1/8	6	4-1/2	.1805	185623	31.34	188120	31.92	192234	35.97	192388	37.73
.1870	1-1/8	6	4-1/2	.1805	185634	31.34	188131	31.92	192245	35.97	192399	37.73
.2480	1-1/2	6	6	.2405	185645	34.18	188142	35.82	192256	37.57	192410	40.96
.2495	1-1/2	6	6	.2405	185656	34.18	188153	35.82	192267	37.57	192421	40.96
.3105	1-1/2	6	6	.2792	185667	40.14	188164	51.29	192278	44.20	192432	53.20
.3120	1-1/2	6	6	.2792	185678	40.14	188175	51.29	192289	44.20	192443	53.20
.3730	1-3/4	6	7	.3105	185689	43.34	188186	56.20	192300	47.71	192454	58.27
.3745	1-3/4	6	7	.3105	185700	43.34	188197	56.20	192311	47.71	192465	58.27
.4355	1-3/4	6	7	.3730	185711	48.91	188208	72.10	192322	56.67	192476	77.29
.4370	1-3/4	6	7	.3730	185722	48.91	188219	72.10	192333	56.67	192487	77.29
.4980	2	6	8	.4355	185733	53.28	188230	82.71	192344	61.74	192498	88.59
.4995	2	6	8	.4355	185744	53.28	188241	82.71	192355	61.74	192509	88.59

DIAMETER TOLERANCES FOR DOWEL PIN SIZES

+0.0000, -0.0002

## TAPER SHANK - 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	57.53
9/32	.2812	1-1/2	6	6	1	197602	60.22
5/16	.3125	1-1/2	6	6	1	197613	59.20
11/32	.3438	1-1/2	6	6	1	197624	64.15
3/8	.3750	1-3/4	6	7	1	197635	66.18
13/32	.4062	1-3/4	6	7	1	197646	67.35
7/16	.4375	1-3/4	6	7	1	197657	67.66
15/32	.4688	1-3/4	6	7	1	197668	73.08
1/2	.5000	2	6	8	1	197679	74.09
17/32	.5312	2	6	8	1	197690	82.47
9/16	.5625	2	8	8	1	197701	87.97
19/32	.5938	2	8	8	1	197712	89.53
5/8	.6250	2-1/4	8	9	2	197723	95.37
21/32	.6562	2-1/4	8	9	2	197734	96.27
11/16	.6875	2-1/4	8	9	2	197745	96.27
23/32	.7188	2-1/4	8	9	2	197756	108.55
3/4	.7500	2-1/2	8	9-1/2	2	197767	108.55
25/32	.7182	2-1/2	8	9-1/2	2	197778	124.06
13/16	.8125	2-1/2	8	9-1/2	2	197789	124.06
27/32	.8438	2-1/2	8	9-1/2	2	197800	138.52
7/8	.8750	2-5/8	8	10	2	197811	140.00

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
29/32	.9062	2-5/8	8	10	2	197822	154.11
15/16	.9375	2-5/8	8	10	3	197833	154.11
31/32	.9688	2-5/8	8	10	3	197844	169.11
1	1.0000	2-3/4	8	10-1/2	3	197855	170.59
1-1/16	1.0625	2-3/4	8	10-1/2	3	197866	186.50
1-1/8	1.1250	2-7/8	8	11	3	197877	206.96
1-3/16	1.1875	2-7/8	10	11	3	197888	231.94
1-1/4	1.2500	3	10	11-1/2	4	197899	251.12
1-5/16	1.3125	3	10	11-1/2	4	197910	274.62
1-3/8	1.3750	3-1/4	10	12	4	197921	296.80
1-7/16	1.4375	3-1/4	10	12	4	197932	321.70
1-1/2	1.5000	3-1/2	10	12-1/2	4	197943	341.93
1-9/16	1.5625	3-1/2	12	13	4	197954	480.10
1-5/8	1.6250	3-1/2	12	13	4	197965	480.10
1-11/16	1.6875	4	12	13-1/2	5	197976	551.27
1-3/4	1.7500	4	12	13-1/2	5	197987	551.27
1-13/16	1.8125	4	12	14	5	197998	634.91
1-7/8	1.8750	4	12	14	5	198009	634.91
1-15/16	1.9375	4	12	14	5	198020	743.30
2	2.0000	4	12	14	5	198031	743.30
-	-	-	-	-	-	-	-

THRU 1/2" DIAMETER	1/2" TO 5/8"	5/8" TO 1-1/2"	1-1/2" TO 2"
+0.0002, -0.0000	+0.0003, -0.0000	+0.0001, +0.0004	+0.0002, +0.0006

# Expansion Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	148.92
13/32	3/4	6	7	5/16	194467	158.63
7/16	7/8	6	7	3/8	194478	158.63
15/32	7/8	6	8	27/64	194489	164.75
1/2	1	6	8	7/16	194500	167.67
17/32	1	6	8	7/16	194511	174.76
9/16	1-1/8	6	8	7/16	194522	179.21
19/32	1-1/8	6	8	7/16	194533	181.94
5/8	1-1/4	6	9	9/16	194544	187.47
21/32	1-1/4	6	9	9/16	194555	194.95
11/16	1-1/4	6	9	9/16	194566	196.32
23/32	1-1/4	6	9	9/16	194577	209.06
3/4	1-3/8	6	9-1/2	5/8	194588	216.27
25/32	1-3/8	8	9-1/2	5/8	194599	228.98
13/16	1-3/8	8	9-1/2	5/8	194610	237.75
27/32	1-3/8	8	9-1/2	5/8	194621	250.49
7/8	1-1/2	8	10	3/4	194632	255.05

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
29/32	1-1/2	8	10	3/4	194643	268.58
15/16	1-1/2	8	10	3/4	194654	281.17
31/32	1-1/2	8	10	3/4	194665	293.87
1	1-5/8	8	10-1/2	7/8	194676	309.97
1-1/32	1-5/8	8	10-1/2	7/8	194687	431.26
1-1/16	1-5/8	8	10-1/2	7/8	194698	342.59
1-3/32	1-5/8	8	10-1/2	7/8	194709	358.88
1-1/8	1-3/4	8	11	7/8	194720	374.90
1-5/32	1-3/4	8	11	7/8	194731	380.01
1-3/16	1-3/4	8	11	1	194742	394.86
1-7/32	1-3/4	8	11	1	194753	409.24
1-1/4	1-7/8	8	11-1/2	1	194764	425.57
1-5/16	1-7/8	8	11-1/2	1	194775	439.80
1-3/8	2	8	12	1	194786	455.97
1-7/16	2	8	12	1-1/4	194797	474.02
1-1/2	2-1/8	8	12-1/2	1-1/4	194808	494.01
-	-	-	-	-	-	-

## 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	168.96
13/32	3/4	6	7	5/16	1	194830	195.93
7/16	7/8	6	7	3/8	1	194841	178.90
15/32	7/8	6	8	27/64	1	194852	183.14
1/2	1	6	8	7/16	1	194863	186.81
17/32	1	6	8	7/16	1	194874	194.21
9/16	1-1/8	6	8	7/16	1	194885	194.21
19/32	1-1/8	6	8	7/16	1	194896	201.31
5/8	1-1/4	6	9	9/16	2	194907	208.52
21/32	1-1/4	6	9	9/16	2	194918	214.25
11/16	1-1/4	6	9	9/16	2	194929	215.53
23/32	1-1/4	6	9	9/16	2	194940	229.91
3/4	1-3/8	6	9-1/2	5/8	2	194951	237.01
25/32	1-3/8	8	9-1/2	5/8	2	194962	247.92
13/16	1-3/8	8	9-1/2	5/8	2	194973	251.62
27/32	1-3/8	8	9-1/2	5/8	2	194984	266.28
7/8	1-1/2	8	10	3/4	2	194995	276.76

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	291.14
15/16	1-1/2	8	10	3/4	3	195017	298.39
31/32	1-1/2	8	10	3/4	3	195028	310.98
1	1-5/8	8	10-1/2	7/8	3	195039	328.91
1-1/32	1-5/8	8	10-1/2	7/8	3	195050	341.50
1-1/16	1-5/8	8	10-1/2	7/8	3	195061	357.83
1-3/32	1-5/8	8	10-1/2	7/8	3	195072	373.81
1-1/8	1-3/4	8	11	7/8	3	195083	386.71
1-5/32	1-3/4	8	11	7/8	3	195094	402.65
1-3/16	1-3/4	8	11	1	3	195105	418.75
1-7/32	1-3/4	8	11	1	3	195116	434.89
1-1/4	1-7/8	8	11-1/2	1	4	195127	455.00
1-5/16	1-7/8	8	11-1/2	1	4	195138	472.81
1-3/8	2	8	12	1	4	195149	492.41
1-7/16	2	8	12	1-1/4	4	195160	521.29
1-1/2	2-1/8	8	12-1/2	1-1/4	4	195171	539.11
-	-	-	-	-	-	-	-

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

MADE IN USA

185

HSS & COBALT REAMERS

## STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

HSS & COBALT REAMERS

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/16	.0625	1	4	2	.0625	196997	69.49
5/64	.0781	1	4	2	.0781	197008	69.49
3/32	.0938	1-1/4	4	2-1/2	.0938	197019	69.49
7/64	.1094	1-1/4	4	2-1/2	.1094	197030	69.49
1/8	.1250	1-1/2	4	3	.1250	197041	65.52
9/64	.1406	1-5/8	4	3-1/4	.1406	197052	65.52
5/32	.1562	1-5/8	4	3-1/4	.1562	197063	70.82
11/64	.1719	1-3/4	6	3-1/2	.1719	197074	70.82
3/16	.1875	1-3/4	6	3-1/2	.1875	197085	69.49
13/64	.2031	1-7/8	6	3-3/4	.2031	197096	69.49
7/32	.2188	1-7/8	6	3-3/4	.2188	197107	76.59
15/64	.2344	2	6	4	.2344	197118	76.59
1/4	.2500	2	6	4	.2500	197129	76.12
17/64	.2656	2-1/8	6	4-1/4	.2656	197140	76.59
9/32	.2812	2-1/8	6	4-1/4	.2812	197151	82.39
19/64	.2969	2-1/4	6	4-1/2	.2969	197162	82.39
5/16	.3125	2-1/4	6	4-1/2	.3125	197173	80.56
11/32	.3438	2-3/8	6	4-3/4	.3438	197184	93.50
3/8	.3750	2-1/2	6	5	.3750	197195	91.28
13/32	.4062	2-5/8	6	5-1/4	.4062	197206	105.93
7/16	.4375	2-3/4	6	5-1/2	.4375	197217	103.79
15/32	.4688	2-7/8	6	5-3/4	.4688	197228	114.82

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/2	.5000	3	6	6	.5000	197239	110.38
17/32	.5312	3-1/8	8	6-1/4	.5312	197250	119.26
9/16	.5625	3-1/4	8	6-1/2	.5625	197261	127.57
19/32	.5938	3-3/8	8	6-3/4	.5938	197272	141.79
5/8	.6250	3-1/2	8	7	.6250	197283	137.47
21/32	.6562	3-11/16	8	7-3/8	.6562	197294	154.07
11/16	.6875	3-7/8	8	7-3/4	.6875	197305	151.03
23/32	.7188	4-1/16	8	8-1/8	.7188	197316	165.45
3/4	.7500	4-3/16	8	8-3/8	.7500	197327	161.05
25/32	.7812	4-3/8	8	8-3/4	.7812	197338	176.71
13/16	.8125	4-9/16	8	9-1/8	.8125	197349	161.05
27/32	.8438	4-11/16	8	9-3/8	.8438	197360	193.47
7/8	.8750	4-7/8	8	9-3/4	.8750	197371	195.15
29/32	.9062	5	8	10	.9062	197382	215.65
15/16	.9375	5-1/8	8	10-1/4	.9375	197393	195.30
31/32	.9688	5-5/16	8	10-5/8	.9688	197404	237.44
1	1.0000	5-7/16	8	10-7/8	1.0000	197415	236.38
1-1/8	1.1250	5-13/16	8	11-5/8	1.1250	197426	308.92
1-1/4	1.2500	6-1/8	8	12-1/4	1.2500	197437	379.35
1-3/8	1.3750	6-5/16	10	12-5/8	1.3750	197448	448.37
1-1/2	1.5000	6-1/2	10	13	1.5000	197459	529.21
-	-	-	-	-	-	-	-

## 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	81.54
5/64	.0781	1	4	2	.0781	195193	81.54
3/32	.0938	1-1/4	4	2-1/2	.0938	195204	81.54
7/64	.1094	1-1/4	4	2-1/2	.1094	195215	81.54
1/8	.1250	1-1/2	4	3	.1250	195226	80.56
9/64	.1406	1-5/8	4	3-1/4	.1406	195237	80.56
5/32	.1562	1-5/8	4	3-1/4	.1562	195248	86.88
11/64	.1719	1-3/4	6	3-1/2	.1719	195259	86.88
3/16	.1875	1-3/4	6	3-1/2	.1875	195270	86.88
13/64	.2031	1-7/8	6	3-3/4	.2031	195281	86.88
7/32	.2188	1-7/8	6	3-3/4	.2188	195292	84.58
15/64	.2344	2	6	4	.2344	195303	84.58
1/4	.2500	2	6	4	.2500	195314	84.19
17/64	.2656	2-1/8	6	4-1/4	.2656	195325	84.58
9/32	.2812	2-1/8	6	4-1/4	.2812	195336	93.50
19/64	.2969	2-1/4	6	4-1/2	.2969	195347	93.50
5/16	.3125	2-1/4	6	4-1/2	.3125	195358	92.61
11/32	.3438	2-3/8	6	4-3/4	.3438	195369	104.14
3/8	.3750	2-1/2	6	5	.3750	195380	103.83
13/32	.4062	2-5/8	6	5-1/4	.4062	195391	115.37
7/16	.4375	2-3/4	6	5-1/2	.4375	195402	115.76
15/32	.4688	2-7/8	6	5-3/4	.4688	195413	127.80

SIZE	DECIMAL EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
1/2	.5000	3	6	6	.5000	195424	124.68
17/32	.5312	3-1/8	8	6-1/4	.5312	195435	145.57
9/16	.5625	3-1/4	8	6-1/2	.5625	195446	146.39
19/32	.5938	3-3/8	8	6-3/4	.5938	195457	159.21
5/8	.6250	3-1/2	8	7	.6250	195468	156.29
21/32	.6562	3-11/16	8	7-3/8	.6562	195479	171.37
11/16	.6875	3-7/8	8	7-3/4	.6875	195490	170.87
23/32	.7188	4-1/16	8	8-1/8	.7188	195501	184.24
3/4	.7500	4-3/16	8	8-3/8	.7500	195512	180.69
25/32	.7812	4-3/8	8	8-3/4	.7812	195523	196.36
13/16	.8125	4-9/16	8	9-1/8	.8125	195534	196.36
27/32	.8438	4-11/16	8	9-3/8	.8438	195545	214.91
7/8	.8750	4-7/8	8	9-3/4	.8750	195556	214.91
29/32	.9062	5	8	10	.9062	195567	239.58
15/16	.9375	5-1/8	8-10	10-1/4	.9375	195578	239.58
31/32	.9688	5-5/16	8-10	10-5/8	.9688	195589	263.82
1	1.0000	5-7/16	8-10	10-7/8	1.0000	195600	263.82
1-1/8	1.1250	5-13/16	8-10	11-5/8	1.1250	195611	339.59
1-1/4	1.2500	6-1/8	8-10	12-1/4	1.2500	195622	417.85
1-3/8	1.3750	6-5/16	8-10	12-5/8	1.3750	195633	493.00
1-1/2	1.5000	6-1/2	8-10	13	1.5000	195644	583.93
-	-	-	-	-	-	-	-

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

# Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	90.89
1/8	.3160	.3620	6	3/4	2-1/8	.4375	.328	197481	84.73
1/4	.4060	.4720	6	1-1/16	2-7/16	.5625	.421	197492	97.01
3/8	.5400	.6060	6	1-1/16	2-9/16	.7000	.531	197503	109.83
1/2	.6650	.7510	6	1-3/8	3-1/8	.6875	.515	197514	138.75
3/4	.8760	.9620	8	1-3/8	3-1/4	.9063	.679	197525	192.38
1	1.1030	1.2120	8	1-3/4	3-3/4	1.1250	.843	197536	283.08
1-1/4	1.4440	1.5530	10	1-3/4	4	1.3125	.984	197547	476.78
1-1/2	1.6840	1.7930	12	1-3/4	4-1/4	1.5000	1.125	197558	602.87
2	2.1590	2.2680	12	1-3/4	4-1/2	1.8750	1.406	197569	805.27

## 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	72.69	196579	75.42	196348	67.43
6/0	.0611	.0806	4	196128	72.69	196590	75.42	196359	63.49
5/0	.0719	.0966	4	196139	66.26	196601	72.69	196370	65.87
4/0	.0869	.1142	4	196150	66.26	196612	72.69	196381	65.87
3/0	.1029	.1302	4	196161	66.26	196623	72.69	196392	59.48
2/0	.1137	.1462	4	196172	59.24	196634	63.49	196403	60.18
0	.1287	.1638	4	196183	56.98	196645	60.68	196414	61.62
1	.1447	.1798	6	196194	55.19	196656	61.62	196425	62.56
2	.1605	.2008	6	196205	55.19	196667	61.62	196436	70.82
3	.1813	.2294	6	196216	55.19	196678	61.62	196447	73.20
4	.2071	.2604	6	196227	61.62	196689	67.19	196458	82.39
5	.2409	.2994	6	196238	66.26	196700	71.68	196469	90.15
6	.2773	.3540	6	196249	79.98	196711	88.32	196480	105.82
7	.3297	.4220	6	196260	103.01	196722	111.66	196491	130.61
8	.3971	.5050	6	196271	107.77	196733	144.40	196502	153.25
9	.4805	.6066	6	196282	160.07	196744	174.26	196513	168.37
10	.5799	.7216	6	196293	175.74	196755	193.16	196524	213.78
11	.7060	.8780	8	196304	187.28	196766	206.06	196535	226.60
12	.8420	1.0500	8	196315	289.78	196777	318.74	196546	350.78
13	1.0090	1.2590	10	196326	562.06	196788	618.26	196557	679.49
14	1.2500	1.5420	10	196337	900.60	196799	999.48	196568	1,097.46

HSS & COBALT REAMERS

**CAPSCREW COUNTERBORES  
HIGH SPEED STEEL**



**STANDARD • 1/64 o/s • 1/32 o/s**

HSS & COBALT REAMERS

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	41.70
4	1/64 o/s	.1270	1/8	.1990	9/16	3-7/8	195809	41.70
4	1/32 o/s	.1430	1/8	.2150	9/16	3-7/8	195963	41.70
5	std.	.1250	5/32	.2050	5/8	4-1/8	195666	41.70
5	1/64 o/s	.1400	5/32	.2210	5/8	4-1/8	195820	41.70
5	1/32 o/s	.1560	5/32	.2370	5/8	4-1/8	195974	41.70
6	std.	.1380	3/16	.2270	3/4	4-5/8	195677	44.16
6	1/64 o/s	.1530	3/16	.2430	3/4	4-5/8	195831	44.16
6	1/32 o/s	.1690	3/16	.2590	3/4	4-5/8	195985	44.16
8	std.	.1640	7/32	.2700	3/4	5	195688	47.32
8	1/64 o/s	.1790	7/32	.2860	3/4	5	195842	47.32
8	1/32 o/s	.1950	7/32	.3020	3/4	5	195996	47.32
10	std.	.1900	1/4	.3120	7/8	5-1/4	195699	48.33
10	1/64 o/s	.2050	1/4	.3280	7/8	5-1/4	195853	48.33
10	1/32 o/s	.2210	1/4	.3440	7/8	5-1/4	196007	48.33
1/4	std.	.2500	9/32	.3800	1	5-5/8	195710	50.82
1/4	1/64 o/s	.2650	9/32	.3960	1	5-5/8	195864	50.82
1/4	1/32 o/s	.2810	9/32	.4120	1	5-5/8	196018	50.82
5/16	std.	.3125	5/16	.4740	1	6-1/8	195721	63.49
5/16	1/64 o/s	.3280	5/16	.4890	1	6-1/8	195875	63.49
5/16	1/32 o/s	.3430	5/16	.5040	1	6-1/8	196029	63.49
3/8	std.	.3750	3/8	.5690	1-1/4	6-1/2	195732	69.34
3/8	1/64 o/s	.3900	3/8	.5850	1-1/4	6-1/2	195886	69.34
3/8	1/32 o/s	.4060	3/8	.6010	1-1/4	6-1/2	196040	69.34
7/16	std.	.4370	7/16	.6610	1-1/4	7	195743	83.41
7/16	1/64 o/s	.4520	7/16	.6760	1-1/4	7	195897	83.41
7/16	1/32 o/s	.4680	7/16	.6910	1-1/4	7	196051	83.41
1/2	std.	.5000	1/2	.7550	1-1/2	7-1/2	195754	95.45
1/2	1/64 o/s	.5150	1/2	.7710	1-1/2	7-1/2	195908	95.45
1/2	1/32 o/s	.5310	1/2	.7870	1-1/2	7-1/2	196062	95.45
5/8	std.	.6250	5/8	.9430	1-1/2	7-5/8	195765	155.75
5/8	1/64 o/s	.6400	5/8	.9590	1-1/2	7-5/8	195919	155.75
5/8	1/32 o/s	.6560	5/8	1.0000	1-1/2	7-5/8	196073	155.75
3/4	std.	.7500	3/4	1.1310	1-5/8	7-3/4	195776	181.20
3/4	1/64 o/s	.7650	3/4	1.1720	1-5/8	7-3/4	195930	181.20
3/4	1/32 o/s	.7810	3/4	1.1630	1-5/8	7-3/4	196084	181.20
7/8	std.	.8750	7/8	1.3200	1-7/8	8	195787	220.72
7/8	1/64 o/s	.8910	7/8	1.3360	1-7/8	8	195941	220.72
7/8	1/32 o/s	.9060	7/8	1.3520	1-7/8	8	196095	220.72
1	std.	1.0000	1	1.5080	2	8-1/2	195798	280.00
1	1/64 o/s	1.0150	1	1.5240	2	8-1/2	195952	280.00
1	1/32 o/s	1.0310	1	1.5400	2	8-1/2	196106	280.00



# Reamers

MADE IN THE  
USA

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS



SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	2-1/2	5	4-5/8	3/8	196876	80.01
7/16	3-1/4	5	5-3/8	7/16	196887	86.34
1/2	3-3/4	5	5-7/8	1/2	196898	95.56
9/16	3-3/4	5	5-7/8	1/2	196909	99.46
5/8	4-1/4	5	6-3/8	1/2	196920	110.62
11/16	4-1/4	5	6-3/8	1/2	196931	120.59
3/4	4-1/2	5	6-7/8	1/2	196942	139.65
13/16	4-1/2	5	6-7/8	1/2	196953	139.65
7/8	4-1/2	5	6-7/8	1/2	196964	158.40
15/16	4-1/2	5	6-7/8	1/2	196975	158.40
1	4-1/2	5	6-7/8	1/2	196986	180.87
1-1/16	4-1/2	5	6-7/8	1/2	197580	212.78

## CONSTRUCTION REAMERS

HIGH SPEED STEEL  
LEFT HAND SPIRAL  
RIGHT HAND CUT  
BLACK & GOLD  
3 FLATS



SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	HEX SHANK DIAMETER	ITEM#	LIST PRICE
9/16	4	5	5-1/2	1-1/16	198196	168.65
11/16	4-1/2	5	6-3/8	1-1/16	198207	203.94
13/16	5	5	7	1-1/4	198218	243.88
15/16	5	5	7	1-7/16	198229	275.56
1-1/16	5	5	7	1-5/8	198240	364.98
1-3/16	5	5	7	1-13/16	232956	470.16
1-5/16	5	5	7-7/8	2	232967	561.63

## 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	MORSE TAPER #	SMALL DIAMETER	ITEM#	LIST PRICE
7/16	5-1/8	5	9	2	.3050	198042	87.81
1/2	5-1/8	5	9	2	.3125	198053	97.75
9/16	5-1/8	5	9	2	.3430	196810	97.75
5/8	6-1/8	5	10	2	.3750	198064	105.54
11/16	7-1/8	5	11-3/4	3	.3906	196821	112.91
3/4	7-3/8	5	12	3	.5000	196832	147.01
13/16	7-3/8	5	12	3	.5000	196843	147.01
7/8	7-3/8	5	12	3	.5625	198075	161.16
15/16	7-3/8	5	12	3	.6250	196854	172.04
1	7-3/8	5	12	3	.6875	198086	186.96
1-1/16	7-3/8	5	12	3	.7500	196865	194.10
1-1/8	7-3/8	5	12	3	.8125	198097	236.85
1-3/16	7-3/8	5	12	3	.8750	198108	302.76
1-1/4	7-3/8	5	13	4	.9375	198119	344.50
1-5/16	7-3/8	5	13	4	1.0000	198130	407.06
1-3/8	7-3/8	5	13	4	1.0625	198141	422.65
1-7/16	7-3/8	6	13	4	1.1250	198152	439.41
1-1/2	7-3/8	6	13	4	1.1875	198163	498.88
1-9/16	7-3/8	6	13	4	1.2500	198174	599.56
1-5/8	7-3/8	6	13	4	1.3125	198185	691.26

## BRIDGE REAMERS

HIGH SPEED STEEL  
LEFT HAND SPIRAL  
RIGHT HAND CUT

HSS & COBALT REAMERS

MADE IN USA

189



**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	1,212.40
29Pc • 1/16" - 1/2" by 64ths • M42 Cobalt	Straight	185788	1,588.24
60Pc • #1 - #60 • HSS	Straight	185799	1,798.67
60Pc • #1 - #60 • M42 Cobalt	Straight	185810	1,952.85
26Pc • A-Z • HSS	Straight	185821	1,121.90
26Pc • A-Z • M42 Cobalt	Straight	185832	1,561.70
14Pc • Dowel Pin • .1230 - .4995 • HSS	Straight	185755	628.83
14Pc • Dowel Pin • .1230 - .4995 • M42 Cobalt	Straight	185766	824.83
14Pc • O/U • .1240 - .5010 • HSS	Straight	185843	628.83
14Pc • O/U • .1240 - .5010 • M42 Cobalt	Straight	185854	788.20
20Pc • #61 - #80 • HSS	Straight	185865	737.10
10Pc • #4 - 1/2" • Std • Ctr Bore Set • HSS	RH Spiral	185887	618.11
10Pc • #4 - 1/2" • 1/64" OS • Ctr Bore Set • HSS	RH Spiral	185898	618.11
10Pc • #4 - 1/2" • 1/32" OS • Ctr Bore Set • HSS	RH Spiral	185909	618.11

## VI-PRO ENDMILLS - CARBIDE

### VI-PRO

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

#### Speed and Feed Calculation:

$$\text{RPM} = (3.82 \times \text{SFM}) \div \text{Dia.}$$

$$\text{IPR} = \text{IPM} \div \text{RPM}$$

$$\text{SFM} = (\text{RPM} \times \text{Dia.}) \div 3.82$$

$$\text{IPM} = \text{IPT}(\text{chip load}) \times \text{No. of Teeth} \times \text{RPM}$$

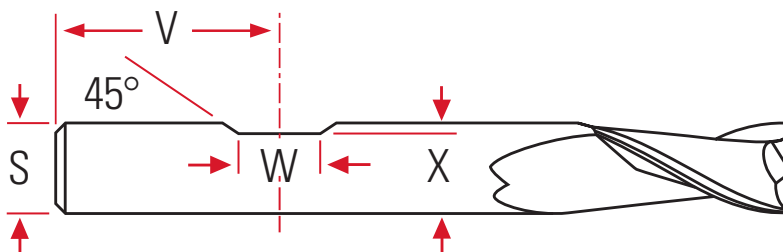
$$\text{IPT}(\text{chip load}) = \text{IPM} \div (\text{No. of teeth} \times \text{RPM})$$

### ALTIN & 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, 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 higher speeds and feeds due to excellent thermal properties under high mechanical loads, and can be used for roughing and finishing operations. Because of its chromium 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. This coating is highly recommended for titanium, high temperature alloys, and hardened and tempered tool steels with 35 HRC or greater.

### Weldon Flat specifications for the VI-PRO



STUB LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2"	.750"	.330"	.332"	.440"
5/8"	.750"	.400"	.402"	.560"
3/4"	.750"	.455"	.457"	.675"

REGULAR LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2" (1-1/4" LOC)	.750"	.330"	.332"	.440"
1/2"	.875"	.330"	.332"	.440"
5/8"	.875"	.400"	.402"	.560"
3/4"	.875"	.455"	.457"	.675"
1"	.875"	.515"	.517"	.925"

LONG LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2" (2" LOC)	.875"	.330"	.332"	.440"
1/2"	1.250"	.330"	.332"	.440"
5/8"	1.250"	.400"	.402"	.560"
3/4"	1.250"	.455"	.457"	.675"
1"	1.250"	.515"	.517"	.925"

EXTRA LONG LENGTH				
S SHANK DIAMETER	V	W		X
		MIN	MAX	
1/2"	1.5"	.330"	.332"	.440"
5/8"	1.5"	.400"	.402"	.560"
3/4"	1.5"	.455"	.457"	.675"
1"	1.5"	.515"	.517"	.925"
-	-	-	-	-

## VI-PRO ENDMILLS - CARBIDE

# VI-PRO 4 FLUTE

### SFM FOR ALTiN, FOR ALcRO-MAX INCREASE UP TO 20%

MATERIAL / TYPE	Rc HARDNESS	4 FLUTE STUB LENGTH	4 FLUTE REG LENGTH	4 FLUTE LONG LENGTH	4 FLUTE EXTRA LONG
<b>COBALT BASE ALLOYS</b>					
STELLITE, HS-21,	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125
HAYNES 25/188, X-40, L-605	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70
<b>NICKEL BASE ALLOYS</b>					
INCONEL-625/718, Waspalloy,	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125
RENE, HASTELLOY	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70
<b>IRON BASE ALLOYS</b>					
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	125 - 175	125 - 175	80 - 125	80 - 125
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	80 - 100	80 - 100	55 - 70	55 - 70
<b>MONEL</b>					
MONEL-65% NICKEL	-	150 - 200	150 - 200	105 - 140	105 - 140
<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
<b>STAINLESS STEEL (PRECIPITATION)</b>					
12/8, 15/5, 17/4, AM-350/355	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210
	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175
<b>STAINLESS STEEL (AUSTENITIC)</b>					
200 SERIES, 302, 303, 304, 316	-	290 - 375	290 - 375	200 - 260	200 - 260
<b>STAINLESS STEEL (AUSTENITIC)</b>					
304L, 316L	UNDER 32	250 - 300	250 - 300	175 - 210	175 - 210
	OVER 32	200 - 250	200 - 250	140 - 175	140 - 175
<b>STAINLESS STEEL (MARTENSITIC)</b>					
403, 410, 416, 440	-	250 - 300	250 - 300	175 - 210	175 - 210
<b>HIGH STRENGTH TOOL STEELS</b>					
4140, 4340, 6150, 5210, A2,	UNDER 32	250 - 350	250 - 350	175 - 210	175 - 210
D2, P20, H11, H13, S2, 01	OVER 32	150 - 200	150 - 200	100 - 140	100 - 140
<b>CARBON STEELS</b>					
1000's, 1100's, 1300's	-	560 - 595	560 - 595	300 - 500	300 - 500
<b>DUCTILE</b>					
DUCTILE CAST IRONS	-	560 - 595	560 - 595	400 - 500	400 - 500
<b>CAST IRONS</b>					
GRAY CAST IRONS	-	560 - 595	560 - 595	400 - 500	400 - 500

**Speed and feed chart parameters are for 4 flute full diameter slotting**

Recommended slotting depth = 1 x diameter

Tool holding important for maximizing tool life. Minimize TIR

Max ramp angle recommended 3° or less

## VI-PRO ENDMILLS - CARBIDE

# VI-PRO 4 FLUTE

### I.P.T. (Inch Per Tooth)

MATERIAL / TYPE	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
<b>COBALT BASE ALLOYS</b>										
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>NICKEL BASE ALLOYS</b>										
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>IRON BASE ALLOYS</b>										
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>MONEL</b>										
MONEL-65% NICKEL	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>TITANIUM ALLOYS</b>										
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>STAINLESS STEEL (PRECIPITATION)</b>										
12/8, 15/5, 17/4, AM-350/355	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>										
200 SERIES, 302, 303, 304, 316	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>										
304L, 316L	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (MARTENSITIC)</b>										
403, 410, 416, 440	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>HIGH STRENGTH TOOL STEELS</b>										
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>CARBON STEELS</b>										
1000's, 1100's, 1300'S	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>DUCTILE</b>										
DUCTILE CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>CAST IRONS</b>										
GRAY CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

Chip Thinning recommended for 4 Flute to optimize tool life:

5% of Diameter Radial engaged: Multiply Feed 3X  
 10% of Diameter Radial engaged: Multiply Feed 2X  
 20% of Diameter Radial engaged: Multiply Feed 1.5X



## VI-PRO ENDMILLS - CARBIDE

# VI-PRO 5 FLUTE

**SFM FOR ALTIM, FOR ALCRO-MAX INCREASE UP TO +20%  
FINISHING PASSES ONLY, 10% OF DIAMETER MAX**

MATERIAL / TYPE	Rc HARDNESS	5 FLUTE STUB LENGTH	5 FLUTE REG LENGTH	5 FLUTE LONG LENGTH	5 FLUTE EXTRA LONG
<b>COBALT BASE ALLOYS</b>					
STELLITE, HS-21,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
HAYNES 25/188, X-40, L-605	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
<b>NICKEL BASE ALLOYS</b>					
INCONEL-625/718, WASPALLOY,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
RENE, HASTELLOY	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
<b>IRON BASE ALLOYS</b>					
INCOLOY 800-802, MULTIMET N-155,	UNDER 32	550 - 570	550 - 570	385 - 400	385 - 400
TIMKIN 16-25-6, CARPENTER 22-b3	OVER 32	200 - 225	200 - 225	140 - 160	140 - 160
<b>MONEL</b>					
MONEL-65% NICKEL	-	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	-	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (PRECIPITATION)</b>					
12/8, 15/5, 17/4, AM-350/355	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (AUSTENITIC)</b>					
200 SERIES, 302, 303, 304, 316	-	600 - 625	600 - 625	420 - 440	420 - 440
<b>STAINLESS STEEL (AUSTENITIC)</b>					
304L, 316L	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
<b>STAINLESS STEEL (MARTENSITIC)</b>					
403, 410, 416, 440	-	600 - 625	600 - 625	420 - 440	420 - 440
<b>HIGH STRENGTH TOOL STEELS</b>					
4140, 4340, 6150, 5210, A2,	UNDER 32	600 - 625	600 - 625	420 - 440	420 - 440
D2, P20, H11, H13, S2, 01	OVER 32	550 - 570	550 - 570	385 - 400	385 - 400
<b>CARBON STEELS</b>					
1000's, 1100's, 1300'S	-	800 - 850	800 - 850	560 - 595	560 - 595
<b>DUCTILE</b>					
DUCTILE CAST IRONS	-	800 - 850	800 - 850	560 - 595	560 - 595
<b>CAST IRONS</b>					
GRAY CAST IRONS	-	800 - 850	800 - 850	560 - 595	560 - 595

## VI-PRO ENDMILLS - CARBIDE

# VI-PRO 5 FLUTE

I.P.T. (Inch Per Tooth)										
MATERIAL / TYPE	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
<b>COBALT BASE ALLOYS</b>										
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>NICKEL BASE ALLOYS</b>										
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>IRON BASE ALLOYS</b>										
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	.0004 - .0008	.0005 - .0011	.0009 - .0016	.0010 - .0018	.0012 - .0019	.0014 - .0021	.0016 - .0028	.0019 - .0031	.0024 - .0037	.0029 - .0041
<b>MONEL</b>										
MONEL-65% NICKEL	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>TITANIUM ALLOYS</b>										
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0018 - .0020	.0017 - .0019	.0019 - .0021	.0026 - .0028	.0029 - .0031	.0035 - .0037	.0039 - .0041
<b>STAINLESS STEEL (PRECIPITATION)</b>										
12/8, 15/5, 17/4, AM-350/355	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>										
200 SERIES, 302, 303, 304, 316	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (AUSTENITIC)</b>										
304L, 316L	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>STAINLESS STEEL (MARTENSITIC)</b>										
403, 410, 416, 440	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>HIGH STRENGTH TOOL STEELS</b>										
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	.0004 - .0008	.0009 - .0011	.0014 - .0016	.0016 - .0020	.0017 - .0025	.0019 - .0031	.0026 - .0032	.0029 - .0037	.0035 - .0039	.0039 - .0041
<b>CARBON STEELS</b>										
1000's, 1100's, 1300'S	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>DUCTILE</b>										
DUCTILE CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056
<b>CAST IRONS</b>										
GRAY CAST IRONS	.0004 - .0008	.0011 - .0013	.0018 - .0020	.0024 - .0026	.0030 - .0032	.0033 - .0035	.0035 - .0037	.0039 - .0041	.0041 - .0043	.0054 - .0056

## HIGH PERFORMANCE ENDMILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS (EXCEPT FOR TERMINATOR).  
FOR COATED TOOLS INCREASE SFM: ZRN = +30% ALTN = +40%

### SFM FOR HIGH PERFORMANCE CARBIDE ENDMILLS TERMINATOR FINISHING PASSES ONLY, 10% OF DIAMETER MAX

MATERIAL / TYPE	Rc HARDNESS	2 Fl, 3 Fl 45° Helix Aluminum	3 Flute 45° & 60° Helix	5 Flute 45° Helix	TERMINATOR ALTN COATING	TERMINATOR ALCRO-MAX COATING
<b>COBALT BASE ALLOYS</b>						
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	- -	200-275 125-175	250-300 150-200	220-270 150-200	265-325 180-240
<b>NICKEL BASE ALLOYS</b>						
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	- -	150-200 90-125	250-300 150-200	220-270 150-200	265-325 180-240
<b>IRON BASE ALLOYS</b>						
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	- -	250-300 150-200	250-300 150-200	220-270 150-200	265-325 180-240
<b>MONEL</b>						
MONEL-65% NICKEL	-	-	200-300	225-350	200-245	240-295
<b>TITANIUM ALLOYS</b>						
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	500 min. -	250-400 -	250-400 -	245-400 -	295-480 -
<b>STAINLESS STEEL (PRECIPITATION)</b>						
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	- -	200-350 150-250	200-350 150-250	200-350 150-245	240-420 180-295
<b>STAINLESS STEEL (AUSTENITIC)</b>						
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	- -	250-350 175-275	250-350 175-275	245-345 170-270	295-415 200-325
<b>STAINLESS STEEL (AUSTENITIC)</b>						
304L, 316L	UNDER 32 OVER 32	- -	125-200 90-125	125-200 90-125	120-200 90-120	145-240 110-145
<b>STAINLESS STEEL (MARTENSITIC)</b>						
403, 410, 416, 440	UNDER 32 OVER 32	- -	200-350 150-250	200-350 150-250	200-350 150-250	240-420 180-300
<b>HIGH STRENGTH TOOL STEELS</b>						
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	- -	225-300 125-200	225-300 125-200	220-300 120-200	265-360 145-240
<b>MEDIUM ALLOY STEELS</b>						
200, 250, 300	UNDER 32 OVER 32	- -	250-350 150-200	250-350 150-200	245-345 150-200	295-415 180-240
<b>CARBON STEELS</b>						
1000's, 1100's, 1300's	UNDER 32 OVER 32	- -	250-350 150-200	250-350 150-200	245-345 150-200	295-415 180-240
<b>DUCTILE</b>						
DUCTILE CAST IRONS	-	-	350-450	300-400	200-300	240-360
<b>CAST IRONS</b>						
GRAY CAST IRONS	-	-	300-400	250-350	170-245	200-295
<b>ALUMINUM</b>						
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	500 min. -	500 min. -	500 min. -	- -	- -
<b>MAGNESIUM</b>						
	-	500 min.	500 min.	500 min.	-	-
<b>COPPER, COPPER ALLOYS</b>						
	-	400-500	400-500	250-350	-	-
<b>BRASS BRONZE</b>						
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	- -	300-400 -	300-400 -	- -	- -	- -
<b>COMPOSITES</b>						
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	250-1000 -	- -	- -	- -	- -

## HIGH PERFORMANCE ENDMILLS - CARBIDE

I.P.T. (Inch Per Tooth)					
MATERIAL / TYPE	Rc HARDNESS	1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"
<b>COBALT BASE ALLOYS</b>					
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>NICKEL BASE ALLOYS</b>					
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>IRON BASE ALLOYS</b>					
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>MONEL</b>					
MONEL-65% NICKEL	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"
<b>TITANIUM ALLOYS</b>					
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"
	-	-	-	-	-
<b>STAINLESS STEEL (PRECIPITATION)</b>					
12/8, 15/5, 17/4, AM-350/355	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>STAINLESS STEEL (AUSTENITIC)</b>					
200 SERIES, 302, 303, 304, 316	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>STAINLESS STEEL (AUSTENITIC)</b>					
304L, 316L	UNDER 32	.0005"-.0008"	.0005"-.0008"	.0008"-.0015"	.0015"-.0030"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0010"	.0010"-.0020"
<b>STAINLESS STEEL (MARTENSITIC)</b>					
403, 410, 416, 440	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>HIGH STRENGTH TOOL STEELS</b>					
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"
<b>MEDIUM ALLOY STEELS</b>					
200, 250, 300	UNDER 32	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"
	OVER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
<b>CARBON STEELS</b>					
1000's, 1100's, 1300's	UNDER 32	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"
	OVER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"
<b>DUCTILE</b>					
DUCTILE CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
<b>CAST IRONS</b>					
GRAY CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
<b>ALUMINUM</b>					
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0150"
	-	-	-	-	-
<b>MAGNESIUM</b>					
	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
<b>COPPER, COPPER ALLOYS</b>					
	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0020"-.0080"
<b>BRASS BRONZE</b>					
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0020"-.0080"
	-	-	-	-	-
<b>COMPOSITES</b>					
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"
	-	-	-	-	-

## HIGH PERFORMANCE ROUGHING ENDMILLS - CARBIDE

### CARBIDE ROUGHERS - SFM & CHIP LOAD

MATERIAL	HARDNESS HRc	SFM UNCOATED	SFM ALTIN	SFM ALCRO-MAX	CHIP LOAD PER TOOTH	
					1/4" - 1/2"	1/2" - 1"
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	<19	258 - 345	430 - 575	430 - 690	.0015 - .0030	.0030 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	20 - 30	210 - 258	350 - 430	350 - 516	.0015 - .0030	.0030 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	31 - 40	126 - 192	210 - 320	210 - 384	.0011 - .0021	.0021 - .0032
AUSTENITIC STAINLESS STEELS, 200 AND 300 SERIES 135-275	<28	150 - 300	250 - 500	250 - 600	.0010 - .0025	.0025 - .0040
FERRITIC, MARTENSITIC 400, 500, & PH STAINLESS STEELS	<35	135 - 258	225 - 430	225 - 516	.0015 - .0030	.0030 - .0045
TITANIUM ALLOYS	32 - 43	75 - 129	125 - 215	125 - 258	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	<32	39 - 87	65 - 145	65 - 174	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	32 - 50	33 - 66	55 - 110	55 - 132	.0009 - .0018	.0018 - .0027
COBALT-BASED HIGH TEMPERATURE ALLOYS	<45	27 - 45	45 - 75	45 - 90	.0009 - .0018	.0018 - .0027

For the long length carbide rougher the SFM should be reduced by 30%.

## ENDMILLS - CARBIDE

### GENERAL RECOMMENDATIONS

All speed and feed recommendations should be considered only as a starting point. The suggested speed & feed values are recommended for uncoated tools only (except for those of the TERMINATOR whose values are for its Altin coating). 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%   ALCRO-MAX = +40 UP TO +60%**

### 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.

#### Speed and Feed Calculations:

$$\text{RPM} = (3.82 \times \text{SFM}) \div \text{Dia.}$$

$$\text{IPR} = \text{IPM} \div \text{RPM}$$

$$\text{SFM} = (\text{RPM} \times \text{Dia.}) \div 3.82$$

$$\text{IPM} = \text{IPT}(\text{chip load}) \times \text{No. of Teeth} \times \text{RPM}$$

$$\text{IPT}(\text{chip load}) = \text{IPM} \div (\text{No. of teeth} \times \text{RPM})$$



## THREADMILLS - CARBIDE

THREADMILLS - SFM & CHIP LOAD								
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	$(\text{INCHES PER TOOTH}) \times (\text{NUMBER OF FLUTES}) \times \text{RPM}$

## BURS - CARBIDE

### SELECTION BY CUT

#### SINGLE CUT:

- Provides the best surface finish and largest contact patch on the work piece.
- Demands greater operator skill since the single flute direction pulls the bur into the work piece.

#### DOUBLE CUT:

- Most popular geometry as the dual flute direction reduces the contact patch on the work piece and therefore provides easier operator control while still maintaining a good surface finish.

#### ALUMINUM CUT:

- These burs employ a coarser flute which results in improved cutting performance for aluminum and aluminum alloys.

CARBIDE BURS - SPEEDS		
CUTTING DIA.	SUGGESTED RPM	MAXIMUM RPM
1/16	55,000 – 85,000	90,000
1/8	35,000 – 65,000	80,000
3/16	30,000 – 55,000	70,000
1/4	25,000 – 50,000	70,000
5/16	20,000 – 40,000	67,000
3/8	18,000 – 40,000	63,000
7/16	16,000 – 38,000	58,000
1/2	14,000 – 36,000	50,000
5/8	12,000 – 25,000	40,000
3/4	10,000 – 20,000	33,000
1	7,500 – 20,000	25,000

When using double cut: Reduce speeds by 25% approximately.  
For stainless steel material: Increase speeds by 50% approximately.

## GENERAL PURPOSE ENDMILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS.  
FOR COATED TOOLS INCREASE SFM: TICN = +25% ALTIN = +40%

### SFM FOR GENERAL PURPOSE CARBIDE ENDMILLS

MATERIAL / TYPE	Rc HARDNESS	2 Flute 30° Helix Stub, Reg	2 Flute 30° Helix Long, X-Long	4 Flute 30° Helix Stub, Reg	4 Flute 30° Helix Long, X-Long
<b>COBALT BASE ALLOYS</b>					
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	- -	- -	175 - 225 125 - 175	150 - 200 100 - 150
<b>NICKEL BASE ALLOYS</b>					
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	- -	- -	125 - 175 70 - 115	150 - 200 100 - 150
<b>IRON BASE ALLOYS</b>					
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	- -	- -	175 - 225 125 - 175	150 - 200 100 - 150
<b>MONEL</b>					
MONEL-65% NICKEL	-	175 - 300	125 - 175	175 - 300	125 - 175
<b>TITANIUM ALLOYS</b>					
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	200 - 300 -	125 - 250 -	200 - 300 -	125 - 250 -
<b>STAINLESS STEEL (PRECIPITATION)</b>					
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	- -	- -	150 - 250 125 - 175	100 - 150 80 - 150
<b>STAINLESS STEEL (AUSTENITIC)</b>					
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	- -	- -	200 - 250 150 - 200	125 - 175 100 - 150
<b>STAINLESS STEEL (AUSTENITIC)</b>					
304L, 316L	UNDER 32 OVER 32	- -	- -	90 - 125 75 - 110	80 - 120 60 - 90
<b>STAINLESS STEEL (MARTENSITIC)</b>					
403, 410, 416, 440	UNDER 32 OVER 32	- -	- -	150 - 250 125 - 175	100 - 150 80 - 150
<b>HIGH STRENGTH TOOL STEELS</b>					
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	- -	- -	150 - 225 60 - 125	125 - 175 80 - 120
<b>MEDIUM ALLOY STEELS</b>					
200, 250, 300	UNDER 32 OVER 32	- -	- -	200 - 250 125 - 175	150 - 200 100 - 150
<b>CARBON STEELS</b>					
1000's, 1100's, 1300's	UNDER 32 OVER 32	- -	- -	200 - 250 125 - 175	150 - 200 100 - 150
<b>DUCTILE</b>					
DUCTILE CAST IRONS	-	250 - 350	200 - 300	300 - 400	200 - 300
<b>CAST IRONS</b>					
GRAY CAST IRONS	-	225 - 325	175 - 250	250 - 350	175 - 250
<b>ALUMINUM</b>					
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	500 min. -	500 min. -	500 min. -	500 min. -
<b>MAGNESIUM</b>					
	-	500 min.	500 min.	500 min.	500 min.
<b>COPPER, COPPER ALLOYS</b>					
	-	400 - 500	400 - 500	300 - 400	250 - 350
<b>BRASS BRONZE</b>					
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	- -	300 - 400 -	300 - 400 -	250 - 350 -	200 - 300 -
<b>COMPOSITES</b>					
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	250 - 1000 -	250 - 1000 -	250 - 1000 -	250 - 1000 -

## GENERAL PURPOSE ENDMILLS - CARBIDE

TECHNICAL INFORMATION

CHIP LOAD FOR GENERAL PURPOSE CARBIDE ENDMILLS						
MATERIAL / TYPE	Rc HARDNESS	UP TO 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1-1/4"
<b>COBALT BASE ALLOYS</b>						
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>NICKEL BASE ALLOYS</b>						
INCONEL-625/718, WASPALLOY, RENE, HASTELLOY	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>IRON BASE ALLOYS</b>						
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>MONEL</b>						
MONEL-65% NICKEL	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"	.0040"-.0060"
<b>TITANIUM ALLOYS</b>						
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"	.0040"-.0060"
<b>STAINLESS STEEL (PRECIPITATION)</b>						
12/8, 15/5, 17/4, AM-350/355	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC)</b>						
200 SERIES, 302, 303, 304, 316	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC)</b>						
304L, 316L	UNDER 32	.0005"-.0008"	.0005"-.0008"	.0008"-.0015"	.0015"-.0030"	.0020"-.0040"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0010"	.0010"-.0020"	.0015"-.0030"
<b>STAINLESS STEEL (MARTENSITIC)</b>						
403, 410, 416, 440	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>HIGH STRENGTH TOOL STEELS</b>						
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
	OVER 32	.0003"-.0005"	.0003"-.0005"	.0005"-.0015"	.0010"-.0030"	.0020"-.0040"
<b>MEDIUM ALLOY STEELS</b>						
200, 250, 300	UNDER 32	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"	.0040"-.0060"
	OVER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
<b>CARBON STEELS</b>						
1000's, 1100's, 1300's	UNDER 32	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0030"-.0050"	.0040"-.0060"
	OVER 32	.0005"-.0010"	.0005"-.0010"	.0008"-.0020"	.0020"-.0040"	.0030"-.0050"
<b>DUCTILE</b>						
DUCTILE CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"	.0050"-.0100"
<b>CAST IRONS</b>						
GRAY CAST IRONS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"	.0050"-.0100"
<b>ALUMINUM</b>						
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0150"	.0050"-.0150"
	-	-	-	-	-	-
<b>MAGNESIUM</b>						
	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"	.0050"-.0100"
<b>COPPER, COPPER ALLOYS</b>						
	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0020"-.0080"	.0040"-.0100"
<b>BRASS BRONZE</b>						
BRASS, ALUM/BRONZE, LOW SILICON BRONZE	-	.0007"-.0015"	.0007"-.0015"	.0010"-.0025"	.0020"-.0080"	.0040"-.0100"
	-	-	-	-	-	-
<b>COMPOSITES</b>						
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	-	.0010"-.0020"	.0010"-.0020"	.0015"-.0040"	.0030"-.0100"	.0050"-.0100"
	-	-	-	-	-	-

## DRILLS - CARBIDE

THESE VALUES ARE FOR UNCOATED TOOLS. FOR ALTiN COATED TOOLS INCREASE SFM +40%

### CARBIDE DRILLING – SFM & CHIP LOAD

MATERIAL / TYPE	Rc HARDNESS	25° HELIX	15° HELIX STR FLT	SUGGESTED CHIP LOAD PER TOOTH				
				1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
<b>COBALT BASE ALLOYS</b>								
STELLITE, HS-21, HAYNES 25/188, X-40, L-605	UNDER 32 OVER 32	100 - 150 80 - 110	100 - 150 80 - 110	.0004"-.0010" .0004"-.0010"	.0008"-.0020" .0005"-.0010"	.0015"-.0025" .0010"-.0015"	.0020"-.0040" .0010"-.0020"	.0025"-.0050" .0015"-.0030"
<b>NICKEL BASE ALLOYS</b>								
INCONEL-625/718, WASSPALLOY, RENE, HASTELLOY	UNDER 32 OVER 32	125 - 150 100 - 125	125 - 175 100 - 125	.0005"-.0015" .0004"-.0010"	.0010"-.0015" .0008"-.0015"	.0015"-.0025" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
<b>IRON BASE ALLOYS</b>								
INCOLOY 800-802, MULTIMET N-155, TIMKIN 16-25-6, CARPENTER 22-b3	UNDER 32 OVER 32	150 - 200 150 - 175	175 - 200 150 - 200	.0010"-.0015" .0008"-.0015"	.0010"-.0020" .0010"-.0020"	.0015"-.0035" .0015"-.0025"	.0020"-.0020" .0020"-.0040"	.0030"-.0060" .0025"-.0050"
<b>MONEL</b>								
MONEL-65% NICKEL	-	100 - 150	100 - 150	.0004"-.0010"	.0008"-.0015"	.0010"-.0015"	.0015"-.0030"	.0020"-.0040"
<b>TITANIUM ALLOYS</b>								
COMMERCIALLY PURE, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si	- -	150 - 200 -	150 - 200 -	.0008"-.0015" -	.0010"-.0020" -	.0015"-.0030" -	.0020"-.0040" -	.0025"-.0050" -
<b>STAINLESS STEEL (PRECIPITATION)</b>								
12/8, 15/5, 17/4, AM-350/355	UNDER 32 OVER 32	125 - 175 80 - 125	150 - 200 100 - 150	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC)</b>								
200 SERIES, 302, 303, 304, 316	UNDER 32 OVER 32	100 - 175 100 - 125	150 - 200 125 - 150	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
<b>STAINLESS STEEL (AUSTENITIC)</b>								
304L, 316L	UNDER 32 OVER 32	80 - 100 60 - 90	90 - 125 80 - 100	.0004"-.0010" .0003"-.0008"	.0008"-.0015" .0005"-.0010"	.0010"-.0015" .0010"-.0015"	.0015"-.0030" .0010"-.0020"	.0020"-.0040" .0015"-.0030"
<b>STAINLESS STEEL (MARTENSITIC)</b>								
403, 410, 416, 440	UNDER 32 OVER 32	100 - 150 80 - 125	125 - 175 100 - 140	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0008"-.0015"	.0015"-.0035" .0010"-.0015"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
<b>HIGH STRENGTH TOOL STEELS</b>								
4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, 01	UNDER 32 OVER 32	100 - 175 80 - 130	125 - 175 80 - 130	.0005"-.0015" .0004"-.0010"	.0010"-.0020" .0010"-.0020"	.0015"-.0025" .0010"-.0020"	.0015"-.0030" .0015"-.0030"	.0020"-.0040" .0020"-.0040"
<b>MEDIUM ALLOY STEELS</b>								
200, 250, 300	UNDER 32 OVER 32	125 - 175 100 - 150	125 - 175 100 - 150	.0010"-.0015" .0005"-.0010"	.0015"-.0025" .0010"-.0020"	.0020"-.0030" .0010"-.0025"	.0020"-.0040" .0015"-.0030"	.0025"-.0050" .0020"-.0040"
<b>CARBON STEELS</b>								
1000's, 1100's, 1300's	UNDER 32 OVER 32	125 - 175 100 - 125	150 - 200 100 - 175	.0010"-.0015" .0005"-.0010"	.0015"-.0025" .0010"-.0020"	.0020"-.0030" .0010"-.0025"	.0020"-.0040" .0015"-.0035"	.0025"-.0050" .0020"-.0040"
<b>DUCTILE</b>								
DUCTILE CAST IRONS	-	125 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>CAST IRONS</b>								
GRAY CAST IRONS	-	100 - 200	150 - 250	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>ALUMINUM</b>								
2014, 2024, 6061-(T1-T6) 7075, DIE CAST, EXTRUDED	- -	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</b>								
BRASS, ALUM/BRONZE	-	150 - 300	-	.0010"-.0020"	.0010"-.0030"	.0015"-.0035"	.0025"-.0040"	.0030"-.0050"
<b>BRASS BRONZE</b>								
LOW SILICON BRONZE	-	125 - 200	-	.0008"-.0015"	.0010"-.0020"	.0015"-.0030"	.0020"-.0040"	.0025"-.0050"
<b>COMPOSITES</b>								
G-10 FIBERGLASS, GRAPHITE, GRAPHITE/EPOXY, PLASTICS	- -	150 - 300 -	150 - 300 -	.0010"-.0020" -	.0010"-.0030" -	.0015"-.0035" -	.0025"-.0040" -	.0030"-.0050" -

## GENERAL PURPOSE TAPS

### MACHINE SCREW TAPS (NC & NF)

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
#0 (.060)	1-5/8	5/16	3/16	.141	.110
#1 (.073)	1-11/16	3/8	3/16	.141	.110
#2 (.066)	1-3/4	7/16	3/16	.141	.110
#3 (.099)	1-13/16	1/2	3/16	.141	.110
#4 (.112)	1-7/8	9/16	3/16	.141	.110
#5 (.125)	1-15/16	5/8	3/16	.141	.110
#6 (.138)	2	11/16	3/16	.141	.110
#8 (.164)	2-1/8	3/4	1/4	.168	.131
#10 (.190)	2-3/8	7/8	1/4	.194	.152
#12 (.216)	2-3/8	15/16	9/32	.220	.165

### FRACTIONAL SIZE TAPS (NC & NF)

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
1/4	2-1/2	1	5/16	.255	.191
5/16	2-23/32	1-1/8	3/8	.318	.238
3/8	2-15/16	1-1/4	7/16	.381	.286
7/16	3-5/32	1-7/16	13/32	.323	.242
1/2	3-3/8	1-21/32	7/16	.367	.275
9/16	3-19/32	1-21/32	1/2	.429	.322
5/8	3-13/16	1-13/16	9/16	.480	.360
11/16	4-1/32	1-13/16	5/8	.542	.406
3/4	4-1/4	2	11/16	.590	.442
7/8	4-11/16	2-7/32	3/4	.697	.523
1	5-1/8	2-1/2	13/16	.800	.600
1-1/8	5-7/16	2-9/16	7/8	.896	.672
1-1/4	5-3/4	2-9/16	1	1.021	.766
1-3/8	6-1/16	3	1-1/16	1.108	.831
1-1/2	6-3/8	3	1-1/8	1.233	.925

### PIPE TAPS - STRAIGHT & TAPER

SIZE	OVERALL LENGTH	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE
1/16 - 27	2-1/8	11/16	3/8	.3125	.234
1/8 - 27	2-1/8	3/4	3/8	.3125(SS)	.234
1/8 - 27	2-1/8	3/4	3/8	.4375(LS)	.328
1/4 - 18	2-7/16	1-1/16	7/16	.5625	.421
3/8 - 18	2-9/16	1-1/16	1/2	.7000	.531
1/2 - 14	3-1/8	1-3/8	5/8	.6875	.515
3/4 - 14	3-1/4	1-3/8	11/16	.9063	.679
1 - 11-1/2	3-3/4	1-3/4	13/16	1.1250	.843
1-1/4 - 11-1/2	4	1-3/4	15/16	1.3125	.984
1-1/2 - 11-1/2	4-1/4	1-3/4	1	1.5000	1.125
2 - 11-1/2	4-1/2	1-3/4	1-1/8	1.8750	1.406

(SS) = SMALL SHANK (LS) = LARGE SHANK

### PULLEY TAPS

SIZE	THREAD LENGTH	SQUARE LENGTH	SHANK DIAMETER	SQUARE	NECK LENGTH	GROUND LENGTH
1/4	1	5/16	.255	.191	3/8	1-1/2
5/16	1-1/8	3/8	.318	.238	3/8	1-9/16
3/8	1-1/4	7/16	.381	.286	3/8	1-5/8
7/16	1-7/16	1/2	.444	.333	7/16	1-11/16
1/2	1-21/32	9/16	.507	.380	1/2	1-11/16
5/8	1-13/16	11/16	.633	.475	5/8	2
3/4	2	3/4	.759	.569	3/4	2-1/4

SEE PAGE 141 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



## PREDATOR TAPS - HIGH PERFORMANCE

### SPEED CHART FOR PREDATOR TAPS

MATERIAL / TYPE	HARDNESS		CUTTING SPEED (fpm)		CUTTING FLUID*
	Bhn	Rc	SPIRAL POINT	SPIRAL FLUTE	
<b>ALUMINUM ALLOYS</b>					
UNALLOYED - 1000 SERIES	-	-	80	60	WS, CO
CAST - 360, A380	-	-	60	45	WS, CO
WROUGHT - 2000-7000 SERIES	-	-	80	60	WS, CO
<b>BRASS</b>					
HIGH-LEADED, FREE CUTTING - C34000, C36000	-	-	60	45	WS
NAVAL, RED - C46400-C46700, C23000	-	-	60	45	WS
<b>CAST IRON</b>					
PEARLITIC, GRAY CAST IRON, FERRITIC - A48 CLASS 20, CLASS 25, CLASS 40	< 253	< 25	20	15	WS
MALLEABLE - ASTM A47 GRADE 32510, SAE J158 GRADE M3210	< 253	< 25	15	12	CO
<b>NICKEL ALLOYS</b>					
NICKEL BASE ALLOY, WROUGHT & CAST - NICKEL 200, MONEL ALLOY 400	< 253	< 25	15	12	CO
HIGH TEMPERATURE ALLOY, WROUGHT & CAST - INCONEL 600, 718, HASTALLOY B & C	253 - 390	25 - 42	10	10	CO
<b>STEEL</b>					
LOW CARBON - 1010, 1018, 1029, 1513, 1522	< 190	< 10	55	40	WS, CO
MEDIUM CARBON - 1030, 1040, 1045, 1050	< 208	< 15	35	25	WS, CO
HIGH CARBON - 1050, 1070, 1080, 1090, 1561, 1572	< 253	< 25	15	12	CO
HIGH STRENGTH STEEL - 4140, 4340	327 - 390	35 - 42	10	10	CO
<b>STAINLESS STEEL</b>					
AUSTENITIC - SAE (300 SERIES)	< 253	< 25	20	15	CO
MARTENSITIC & FERRITIC - 400 SERIES, 416, 420F, 446	253 - 301	25 - 32	15	12	CO
HARDENED - 15-5PH, 17-4PH, A286	< 327 - 390	< 35 - 42	10	10	CO
<b>TITANIUM ALLOYS</b>					
ALPHA & ALPHA-BETA ALLOYS ANNEALED - Ti-6Al-4V	253 - 301	25 - 32	10	10	CO
ALPHA & ALPHA-BETA ALLOYS SOLUTION TREATED & AGED - Ti-6Al-6V	327 - 390	35 - 42	8	8	CO
<b>TOOL STEEL</b>					
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	190 - 253	10 - 25	20	15	CO
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	327 - 390	35 - 42	15	12	CO

Your individual manufacturing conditions will greatly influence speeds.

\* WS - Water Soluble  
CO - Cutting Oil

In most instances cutting fluid manufacturers recommend specific fluid for different materials.

## THREAD FORMING TAPS

SPEED CHART FOR THREAD FORMING TAPS			
MATERIAL / TYPE	HARDNESS		FORMING SPEED (fpm)
	Bhn	Rc	
<b>ALUMINUM ALLOYS</b>			
UNALLOYED - 1000 SERIES	-	-	80
CAST - 360, A380	-	-	60
WROUGHT - 2000-7000 SERIES	-	-	80
<b>BRASS</b>			
HIGH-LEADED, FREE CUTTING - C34000, C36000	-	-	60
NAVAL, RED - C46400-C46700, C23000	-	-	60
<b>NICKEL ALLOYS</b>			
NICKEL BASE ALLOY, WROUGHT & CAST - NICKEL 200, MONEL ALLOY 400	< 253	< 25	15
<b>STEEL</b>			
LOW CARBON - 1010, 1018, 1029, 1513, 1522	< 190	< 10	55
MEDIUM CARBON - 1030, 1040, 1045, 1050	< 208	< 15	35
HIGH CARBON - 1050, 1070, 1080, 1090, 1561, 1572	< 253	< 25	15
<b>STAINLESS STEEL</b>			
AUSTENITIC - SAE (300 SERIES)	< 253	< 25	20
MARTENSITIC & FERRITIC - 400 SERIES, 416, 420F, 446	253 - 301	25 - 32	15
<b>TITANIUM ALLOYS</b>			
ALPHA & ALPHA-BETA ALLOYS ANNEALED - Ti-6Al-4V	253 - 301	25 - 32	10
<b>TOOL STEEL</b>			
HOT WORK, COLD WORK & MOLD - A2, D2, H10, H14, P2, P13	190 - 253	10 - 25	20

### CALCULATING TAP DRILL SIZES - THREAD FORMING TAPS

$$\text{DRILL SIZE} = \text{MAJOR DIAMETER} - [(0.0068 \times \text{desired \% of thread}) \div \text{Threads Per Inch}]$$

$$\text{DRILL SIZE (mm)} = \text{MAJOR DIAMETER} - [(0.0068 \times \text{desired \% of thread} \times \text{Pitch (mm)})]$$

### GUIDELINES FOR USING THREAD FORMING TAPS

**PRE-TAP HOLE SIZE** - Thread Forming taps require a larger pre-tap hole size than a cutting tap. Tapping with too small of a pre-tap hole size results in excessive tap wear, torque and possible tap breakage.

**LUBRICATION** - Forming Taps require good lubrication. Cutting oils are generally preferred because of their lubricity compared to water soluble coolants.

## THREAD FORMING TAPS

PRE TAP HOLE SIZE				
TAP SIZE	TPI	75% THREAD	65% THREAD	NEAREST DRILL SIZE
0	80	0.054	0.055	#54 or 1.4 mm
1	64	0.066	0.067	#51 or 1.7 mm
1	72	0.067	0.068	#51 or 1.75 mm
2	56	0.078	0.079	#47 or 2.0 mm
2	64	0.079	0.080	2.0 mm
3	48	0.090	0.091	2.3 mm
3	56	0.091	0.092	2.3 mm
4	40	0.100	0.101	#39
4	48	0.103	0.104	#37
5	40	0.113	0.114	#33 or 2.9 mm
5	44	0.114	0.115	#33 or 2.9 mm
6	32	0.124	0.125	3.1 mm
6	40	0.126	0.127	1/8" or 3.2 mm
8	32	0.149	0.150	#25 or 3.8 mm
8	36	0.151	0.152	#24
10	24	0.170	0.172	11/64"
10	32	0.175	0.176	#16 or .176"
12	24	0.196	0.198	#9 or 5.0 mm
12	28	0.199	0.201	#7 or 5.1 mm
1/4	20	0.225	0.227	5.75 mm
1/4	28	0.233	0.235	"A"
5/16	18	0.285	0.287	7.25 mm
5/16	24	0.292	0.294	.293"
3/8	16	0.344	0.347	"S" or 11/32"
3/8	24	0.355	0.357	9.0 mm
7/16	14	0.402	0.405	"Y"
7/16	20	0.414	0.416	"Z" or 10.5 mm
1/2	13	0.462	0.466	.463"

PRE TAP HOLE SIZE - METRIC				
TAP SIZE	PITCH	75% THREAD	65% THREAD	NEAREST DRILL SIZE
M1.6	0.35	0.057	0.058	1.45 mm
M1.7	0.35	0.061	0.062	1.55 mm
M2	0.4	0.072	0.073	1.85 mm
M2.5	0.45	0.091	0.092	2.30 mm
M3	0.5	0.110	0.111	#35
M3.5	0.6	0.128	0.129	#30
M4	0.7	0.145	0.146	3.70 mm
M5	0.8	0.183	0.184	#14
M6	1	0.218	0.220	5.50 mm
M8	1.25	0.291	0.294	7.40 mm
M10	1.5	0.365	0.368	9.30 mm
M12	1.75	0.439	0.442	7/16"

### WHERE TO USE THREAD FORMING TAPS

Materials particularly well suited for thread forming include aluminum, brass, copper, lead, stainless steel, carbon steel, cast steel, leaded steel and zinc. In general, any material which produces a stringy chip is a good candidate for cold forming threads. If the chips are powdery, the material may be too brittle. Forming taps generate threads without producing chips. The threads produced are much stronger than those created by cut taps because of the displacements of the grain of the metal in the workpiece. Cutting taps produce chips which may interfere with the tapping process.

### MAJOR ADVANTAGES TO THREAD FORMING

- Chipless Tapping – no chip removal problems in blind holes.
- Stronger Threads – the grain flow of formed threads follows the contour of the thread in steel and stainless steel, resulting in greater thread strength.
- Better Thread Gaging – forming taps create their own lead therefore the possibility of producing oversized threads is greatly reduced.
- Stronger Taps – the absence for the need for flutes results in a stronger more solid tap.
- Longer Tap Life – forming taps last 3 to 20 times longer because they have no cutting edge to dull.
- More Efficient Production – longer tap life, less tap breakage and faster tapping speeds (up to 2X faster than cutting taps).
- Ideal for Non-Lead Screw Tappers – the ability to form their own lead makes forming taps well suited for NC machines or other machines without lead screws.

## DRILLS - HIGH SPEED STEEL

### ELEMENT & DIMENSIONAL TOLERANCES FOR 2, 3 & 4 FLUTE DRILLS

#### DIAMETER AT POINT

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+0.000 TO -0.005
OVER 1/8 TO 1/4	+0.000 TO -0.007
OVER 1/4 TO 1/2	+0.000 TO -0.010
OVER 1/2 TO 1	+0.000 TO -0.012
OVER 1 TO 2	+0.000 TO -0.015
OVER 2 TO 3-1/2	+0.000 TO -0.020

#### SHANK DIAMETER

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	-0.000 TO -0.025
OVER 1/8 TO 1/4	-0.005 TO -0.030
OVER 1/4 TO 1/2	-0.005 TO -0.045
OVER 1/2 TO 2	-0.005 TO -0.030

#### BACK TAPER

SIZE (INCLUSIVE)	TOLERANCE PER INCH
OVER #81 TO 1/8	.0000 TO .0008
OVER 1/8 TO 1/4	.0002 TO .0008
OVER 1/4 TO 1/2	.0002 TO .0009
OVER 1/2 TO 1	.0003 TO .0011
OVER 1 TO 3-1/2	.0004 TO .0015

#### FLUTE LENGTH

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

#### OVERALL LENGTH

SIZE (INCLUSIVE)	TOLERANCE
OVER #81 TO 1/8	+1/8 TO -1/16
OVER 1/8 TO 1/2	+1/8 TO -1/8
OVER 1/2 TO 1	+1/4 TO -1/8
OVER 1 TO 2	+1/4 TO -1/4
OVER 2 TO 3-1/2	+3/8 TO -3/8

#### INCLUDED POINT ANGLE

SIZE (INCLUSIVE)	INCLUDED ANGLE	TOLERANCE
1/16 TO 1/2	118°	±5°
OVER 1/2 TO 1-1/2	118°	±3°
OVER 1-1/2 TO 3-1/2	118°	±2°

#### LIP HEIGHT

SIZE (INCLUSIVE)	TIV (TOTAL INDICATOR VARIATION)
1/16 TO 1/8	.0020
OVER 1/8 TO 1/4	.0030
OVER 1/4 TO 1/2	.0040
OVER 1/2 TO 1	.0050
OVER 1 TO 3-1/2	.0060

NOTE: 95% of drills in any one lot to fall within tolerances above.

#### SUGGESTED METHOD OF MEASUREMENT:

1. Rotate the drill in a vee block against a back end stop.
2. Measure the cutting lip height variation on a comparator, or with an indicator set at allocation approximately 75% of the distance from the center to the periphery of the drill.

#### CENTRALITY OF WEB

SIZE (INCLUSIVE)	TIV (TOTAL INDICATOR VARIATION)
1/16 TO 1/8	.0030
OVER 1/8 TO 1/4	.0040
OVER 1/4 TO 1/2	.0050
OVER 1/2 TO 1	.0070
OVER 1 TO 3-1/2	.0100

NOTE: 95% of drills in any one lot to fall within tolerances above.

#### SUGGESTED METHOD OF MEASUREMENT:

1. Rotate the drill in a close fitting bushing.
2. Record the difference in indicator readings of the web at the point as the drill is indexed 180°.

#### FLUTE SPACING

SIZE (INCLUSIVE)	TOLERANCE (TIV)	ACTUAL DEVIATION
1/16 TO 1/8	.0030	.0015
OVER 1/8 TO 1/4	.0060	.0030
OVER 1/4 TO 1/2	.0100	.0050
OVER 1/2 TO 1	.0140	.0070
OVER 1 TO 3-1/2	.0260	.0130

NOTE: 95% of drills in any one lot to fall within tolerances above.

#### SUGGESTED METHOD OF MEASUREMENT:

1. Place the drill in a vee block against a back end stop, and rotate it against a radial finger stop.
2. Take an indicator reading at the leading edge of the margin on the opposite flute.
3. Repeat for the other flute and note the difference between the two readings.
4. The deviation in flute spacing is equal to one-half the difference between the two readings.

## DRILLS - HIGH SPEED STEEL

TECHNICAL INFORMATION

SFM & CHIP LOAD													
MATERIAL / TYPE	SFM			FEED in INCHES PER REVOLUTION (IPR) +/-25%									
	GENERAL PURPOSE	HSS HEAVY DUTY	COBALT	1/32"	3/32"	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	9/16"
<b>STEEL</b>													
12L14, 12L15	115	115	115	.0008-.0009	.0026-.0033	.0040-.0053	.0046-.0060	.0051-.0067	.0059-.0078	.0075-.0098	.009-.0117	.0096-.0124	.0107-.0137
1005-1025, 1214, 1215, A36	98	98	98	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
1000'S, 1100'S	82	89	89	0.0007	.0020-.0022	.0029-.0033	.0033-.0038	.0037-.0043	.0043-.0050	.0054-.0063	.0065-.0075	.0070-.0081	.0080-.0091
4140, 4340, 52100, 8620, H11-H41, A2, D2, 01, P20, 420	30-66	33-79	33-79	.0006-.0007	.0015-.0020	.0021-.0029	.0024-.0033	.0027-.0037	.0031-.0043	.0039-.0054	.0047-.0065	.0051-.0070	.0059-.0080
<b>STAINLESS STEEL</b>													
200, 303, 416, 440	49	72	72	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
300 SERIES	26	36	36	0.0007	0.0022	0.0033	0.0038	0.0043	0.005	0.0063	0.0075	0.0081	0.0091
318-329, 400-446, DUPLEX	30	49	49	0.0006	0.0013	0.0017	0.002	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049
<b>CAST IRON</b>													
GREY, G10, Gg40, J431C, A48 CLASS 20	79-98	92-115	92-115	.0006-.0008	.0013-.0026	.0021-.0040	.0024-.0046	.0027-.0051	.0031-.0059	.0039-.0075	.0047-.009	.0051-.0096	.0059-.0107
A220, A436, A439, A602, BLACK	66	72	72	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
BLACK Gts/Gtw, J434C	46	56	56	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
<b>TITANIUM</b>													
COMMERCIALLY PURE	75	92	92	0.0007	.0017-.0020	.0024-.0029	.0028-.0033	.0031-.0037	.0037-.0043	.0045-.0054	.0055-.0065	.0059-.0070	.0068-.0080
6Al4V, 6A14V-2SnMonel, Monel K	20-39	36-66	36-66	0.0006	.0011-.0015	.0015-.0021	.0016-.0024	.0018-.0027	.0021-.0031	.0026-.0039	.0031-.0047	.0035-.0051	.0041-.0059
<b>NICKEL</b>													
COMMERCIALLY PURE, 17644, 200, 5553	33	49	49	0.0007	0.0022	0.0033	0.0038	0.0043	0.005	0.0063	0.0075	0.0081	0.0091
Monel 400, Hastelloy C, Inconel 625, Waspalloy	20	23	23	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068
Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286	10	20	20	.0004-.0006	.0009-.0011	.0011-.0015	.0013-.0016	.0014-.0018	.0017-.0021	.0021-.0026	.0024-.0031	.0027-.0035	.0032-.0041
<b>COPPER</b>													
COMMERCIALLY PURE	108	125	125	.0007-.0008	.0022-.0026	.0033-.0040	.0038-.0046	.0043-.0051	.0050-.0059	.0063-.0075	.0075-.0090	.0081-.0096	.0091-.0107
BRASS, BRONZE 314-340, 350-370	115	131	131	.0007-.0008	.0020-.0030	.0029-.0047	.0033-.0053	.0037-.0059	.0043-.0068	.0054-.0087	.0065-.0104	.0070-.0110	.008-.0122
BRASS ALLOYED Cu+Al+Fe, LONG CHIPPING	89	89	89	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
High Strength Bronze	52	69	69	0.0007	.0020-.0022	.0029-.0033	.0033-.0038	.0037-.0043	.0043-.0050	.0054-.0063	.0065-.0075	.0070-.0081	.0080-.0091
<b>ALUMINUM, MAGNESIUM</b>													
Commercially Pure	108	108	108	0.0009	0.0033	0.0053	0.006	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137
6061, T6	89-98	98	98	.0007-.0009	.0022-.0033	.0033-.0053	.0038-.0060	.0043-.0067	.0050-.0078	.0063-.0098	.0075-.0117	.0081-.0124	.0091-.0137
<b>SYNTHETIC MATERIALS</b>													
Thermoplastics	98	-	-	0.0009	0.0033	0.0053	0.006	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137
Thermosetting Plastics	92	-	-	0.0008	0.0026	0.004	0.0046	0.0051	0.0059	0.0075	0.009	0.0096	0.0107
Reinforced Plastic Material	46	-	-	0.0007	0.002	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.007	0.008





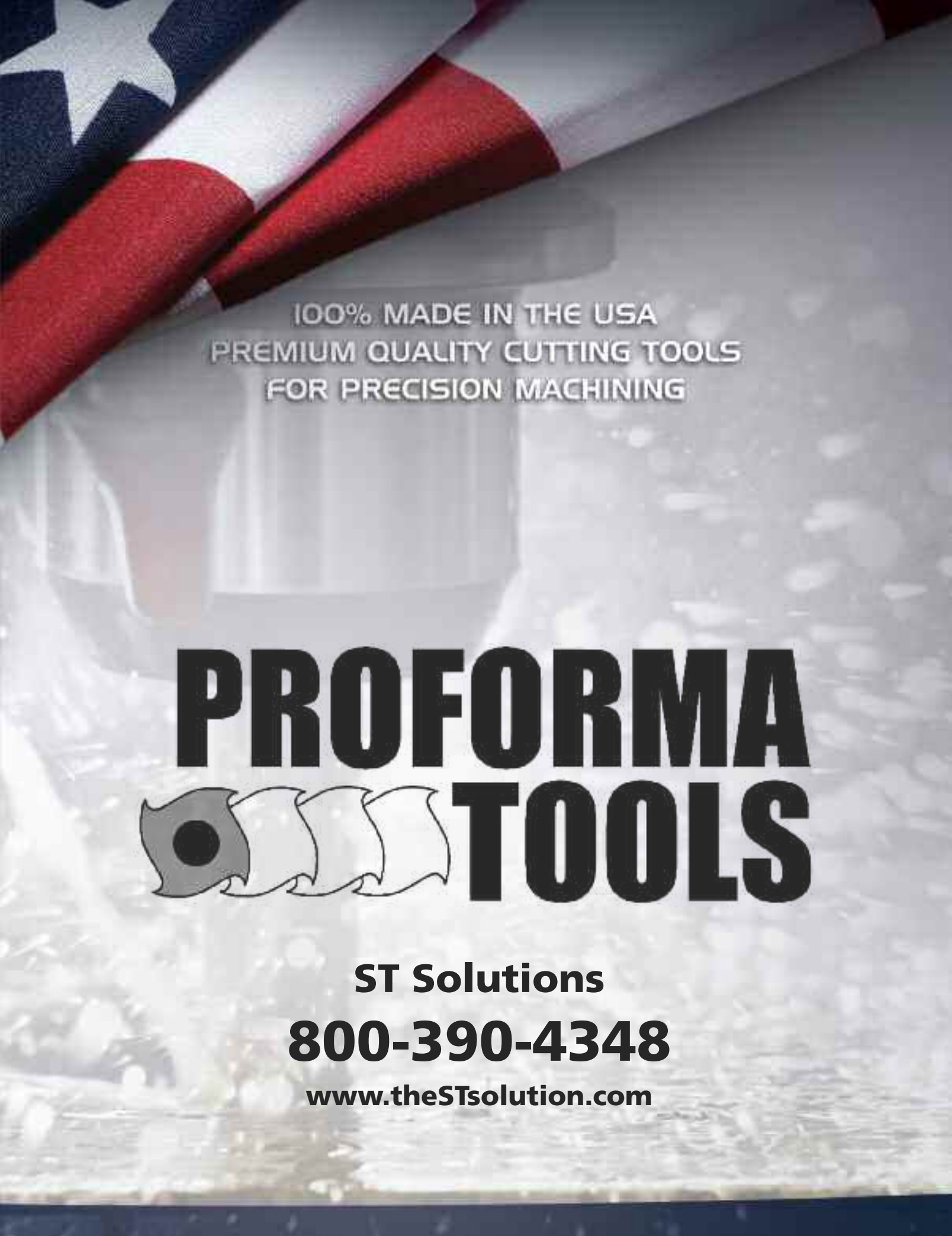
# Decimal Equivalent Chart

**MADE IN THE USA**

PREMIUM QUALITY AMERICAN-MADE CUTTING TOOLS

## 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	3/8-18NPT
.17mm	.0067	3/64	.0469	#0-80	3.8mm	.1496		J	.2770		14.5mm	.5709	m16x1.5
94	.0071	1.2mm	.0472		24	.1520		7.1mm	.2795		37/64	.5781	5/8-18NF
.18mm	.0071	1.25mm	.0492	m1.6x0.35	3.9mm	.1535		K	.2810		15mm	.5906	
93	.0075	1.3mm	.0512		23	.1540		9/32	.2812	5/16-32NS	19/32	.5938	3/8-18 NPS PIPE
.19mm	.0075	55	.0520		5/32	.1562		7.2mm	.2835		39/64	.6094	
92	.0079	1.35mm	.0531		22	.1570	3/16-32NS	7.25mm	.2854		15.5mm	.6102	m18x2.5
.2mm	.0079	54	.0550		4mm	.1575		7.3mm	.2874		5/8	.6250	11/16-16NS
91	.0083	1.4mm	.0551		21	.1590	#10-32	L	.2900		16mm	.6299	m18x2.0
.21mm	.0083	1.45mm	.0571	m1.8x0.35	20	.1610		7.4mm	.2913		41/64	.6406	
90	.0087	1.5mm	.0591		4.1mm	.1614		M	.2950		16.5mm	.6496	
.22mm	.0087	53	.0595	#1-64,72	4.2mm	.1654	m5x0.8	7.5mm	.2953		21/32	.6562	3/4-10NC
89	.0091	1.55mm	.0610		19	.1660		19/64	.2969		17mm	.6693	
.23mm	.0091	1/16	.0625		4.25mm	.1673		7.6mm	.2992		43/64	.6719	
.24mm	.0094	1.6mm	.0630	m2x0.4	4.3mm	.1693		N	.3020		11/16	.6875	3/4-16NF
88	.0095	52	.0635		18	.1695		7.7mm	.3031		17.5mm	.6890	m20x2.5
.25mm	.0098	1.65mm	.0650		11/64	.1719		7.75mm	.3051	m9x1.25	45/64	.7031	1/2-14NPT PIPE
87	.0100	1.7mm	.0669		17	.1730		7.8mm	.3071		18mm	.7087	m20x2.0
.26mm	.0102	51	.0670	#2-56	4.4mm	.1732		7.9mm	.3110		23/32	.7188	
86	.0105	1.75mm	.0689	m2.2x0.45	16	.1770	#12-24	5/16	.3125	3/8-16NC	18.5mm	.7283	m20x1.5
.27mm	.0106	50	.0700	#2-64	4.5mm	.1772		8mm	.3150		47/64	.7344	1/2-14NPS PIPE
85	.0110	1.8mm	.0709		15	.1800		O	.3160		19mm	.7480	
.28mm	.0110	1.85mm	.0728		4.6mm	.1811		8.1mm	.3189		3/4	.7500	
.29mm	.0114	49	.0730		14	.1820	#12-28	8.2mm	.3228		49/64	.7656	7/8-9NC
84	.0115	1.9mm	.0748	m2.3x.04	13	.1850		P	.3230		19.5mm	.7677	m22x2.5
.3mm	.0118	48	.0760		4.7mm	.1850		8.25mm	.3248		25/32	.7812	
83	.0120	1.95mm	.0768		4.75mm	.1870		8.3mm	.3268		20mm	.7874	m22x2.0
82	.0125	5/64	.0781		3/16	.1875		21/64	.3281		51/64	.7969	
.32mm	.0126	47	.0785	#3-48	4.8mm	.1890		8.4mm	.3307		20.5mm	.8071	m22x1.5
81	.0130	2mm	.0787		12	.1890	7/32-32NS	Q	.3320	1/8-27NPT PIPE 3/8-24NF	13/16	.8125	7/8-14NF
.34mm	.0134	2.05mm	.0807	m2.5x0.45	11	.1910		8.5mm	.3346	m10x1.5	21mm	.8268	m24x3
80	.0135	46	.0810		4.9mm	.1929		8.6mm	.3386		53/64	.8281	
.35mm	.0138	45	.0820	#3-56	10	.1935		R	.3390		27/32	.8438	
.36mm	.0142	2.1mm	.0827		9	.1960		8.7mm	.3425		21.5mm	.8465	
79	.0145	2.15mm	.0846	m2.6x0.45	5mm	.1969	m6x1	11/32	.3438		55/64	.8594	
.38mm	.0150	44	.0860	#4-36	8	.1990		8.75mm	.3445	m10x1.25	22mm	.8661	m24x2
1/64	.0156	2.2mm	.0866		5.1mm	.2008		8.8mm	.3465		7/8	.8750	1-8NC
.4mm	.0157	2.25mm	.0886		7	.2010	1/4-20	S	.3480	1/8-27NPS PIPE	22.25mm	.8760	
78	.0160	43	.0890	#4-40	13/64	.2031		8.9mm	.3504		22.5mm	.8858	m24x1.50
.42mm	.0165	2.3mm	.0906		6	.2040		9mm	.3543	m10x1.00	57/64	.8906	
.44mm	.0173	2.35mm	.0925		5.2mm	.2047		T	.3580		23mm	.9055	
.45mm	.0177	42	.0935	#4-48	5	.2055		9.1mm	.3583		29/32	.9062	3/4-14NPT PIPE
77	.0180	3/32	.0938		5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	
.46mm	.0181	2.4mm	.0945		5.3mm	.2087		9.2mm	.3622		23.5mm	.9252	
.48mm	.0189	41	.0960		4	.2090	1/4-24	9.25mm	.3642		15/16	.9375	3/4-14 NPS 1-14 NF
.5mm	.0197	2.45mm	.0965		5.4mm	.2126		9.3mm	.3661		24mm	.9449	m27x3
76	.0200	40	.0980		3	.2130	1/4-28	U	.3680	7/16-14NC	61/64	.9531	
75	.0210	2.5mm	.0984	m3x0.5	5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
.55mm	.0217	39	.0995	#5-40	7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
74	.0225	38	.1015		5.6mm	.2205		3/8	.3750		25mm	.9843	m27x2
.6mm	.0236	2.6mm	.1024		2	.2210		V	.3770		63/64	.9844	1-1/8-7NC
73	.0240	37	.1040	#5-44	5.7mm	.2244		9.6mm	.3780		1	1.0000	
72	.0250	2.7mm	.1063		5.75mm	.2264		9.7mm	.3819		25.5mm	1.0039	
.65mm	.0256	36	.1065	#6-32	1	.2280		9.75mm	.3839		1-1/64	1.0156	
71	.0260	2.75mm	.1083		5.8mm	.2283		9.8mm	.3858		26mm	1.0236	
.7mm	.0276	7/64	.1094		5.9mm	.2323		W	.3860		1-1/32	1.0312	
70	.0280	35	.1100		A	.2340		9.9mm	.3898		26.5mm	1.0433	m30x3.5
.69	.0292	2.8mm	.1102		15/64	.2344		25/64	.3906	7/16-20	1-3/64	1.0469	1-1/8-12NF
.75mm	.0295	34	.1110		6mm	.2362	m7x1	10mm	.3937	m12x1.75	1-1/16	1.0625	
68	.0310	33	.1130	#6-40	B	.2380		X	.3970		27mm	1.0630	
1/32	.0312	2.9mm	.1142	m3.5x0.6	6.1mm	.2402		Y	.4040		1-5/64	1.0781	
.8mm	.0315	32	.1160		C	.2420	1/16-27 NPT PIPE	13/32	.4062		27.5mm	1.0827	
67	.0320	3mm	.1181		6.2mm	.2441		Z	.4130		1-3/32	1.0938	
66	.0330	31	.1200		D	.2460		10.5mm	.4134	m12x1.25	28mm	1.1024	m30x2.0
.85mm	.0335	3.1mm	.1220		6.25mm	.2461		27/64	.4219	1/2-13	1-7/64	1.1094	1-1/4-7NC
65	.0350	1/8	.1250	5/32-32NS	6.3mm	.2480		11mm	.4331		28.5mm	1.1220	
.9mm	.0354	3.2mm	.1260		E	.2500	1/16-27 NPS PIPE	7/16	.4375	1/4-18 NPT PIPE	1-1/8	1.1250	
64	.0360	3.25mm	.1280		1/4	.2500		11.5mm	.4528		1-9/64	1.1406	
63	.0370	30	.1285	5/32-36NS	6.4mm	.2520		29/64	.4531	1/4-18 <sup>NPS</sup> PIPE 1/2-20	29mm	1.1417	
.95mm	.0374	3.3mm	.1299	m4x0.70	6.5mm	.2559		15/32	.4688		1-5/32	1.1562	1-11/2NPT PIPE
62	.0380	3.4mm	.1339		F	.2570	5/16-18NC	12mm	.4724	m14x2	29.5mm	1.1614	
61	.0390	29	.1360	#8-32	6.6mm	.2598		31/64	.4844	9/16-12	1-11/64	1.1719	1-1/4-12NF
1mm	.0394	3.5mm	.1378		G	.2610		12.5mm	.4921	m14x1.5			
60	.0400	28	.1405		6.7mm	.2638		1/2	.5000				
59	.0410	9/64	.1406		17/64	.2656		13mm	.5118	m14x1.25			
1.05mm	.0413	3.6mm	.1417		6.75mm	.2657	m8x1.25	33/64	.5156	9/16-18			



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