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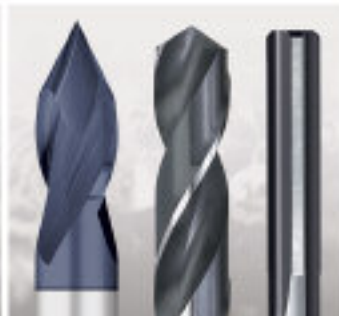
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2011 PRODUCT CATALOG

MADE IN THE USA MADE IN THE USA MADE IN THE USA MADE IN THE USA MADE IN THE USA

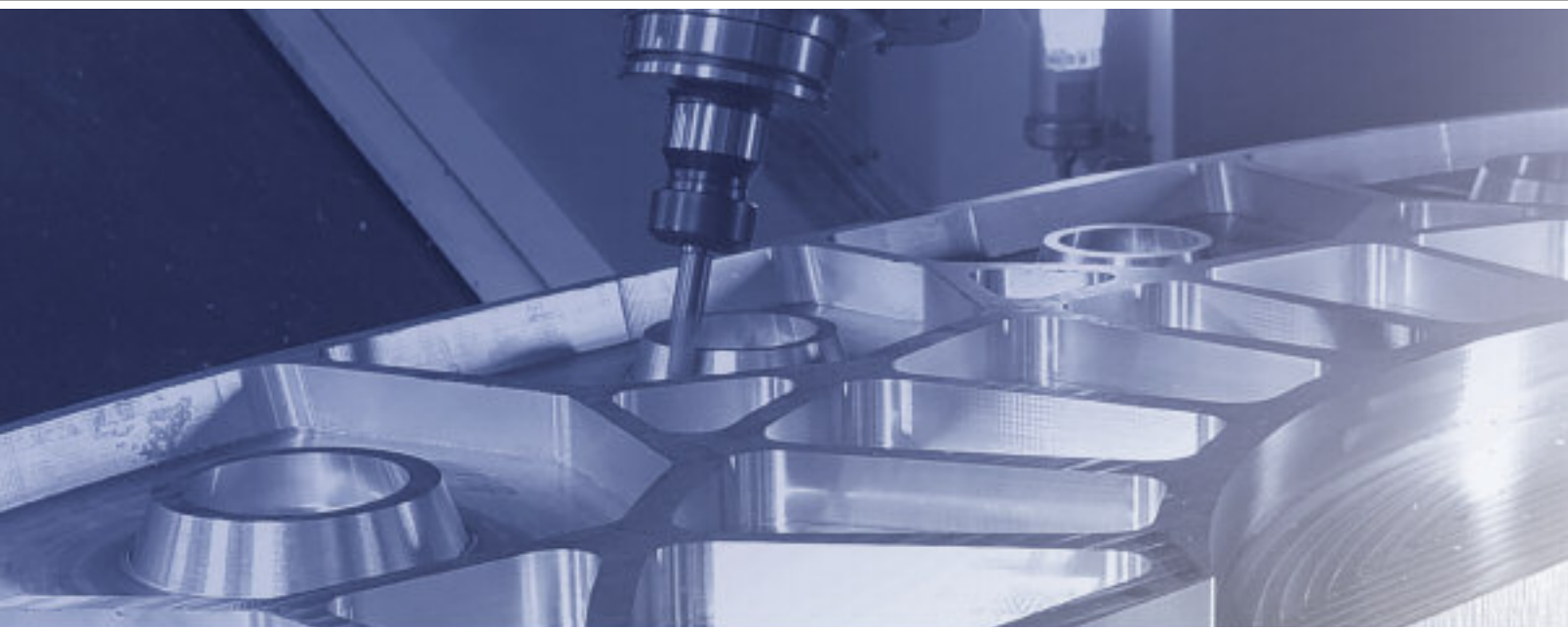
**PREMIUM QUALITY AMERICAN MADE
CUTTING TOOLS FOR PRECISION MACHINING
SOLID CARBIDE ■ HIGH SPEED STEEL ■ COBALT**



**ENDMILLS
MICRO ENDMILLS
THREADMILLS**

**DRILL MILLS
DRILLS
REAMERS**

**BURS
COUNTERSINKS
TAPS & DIES**

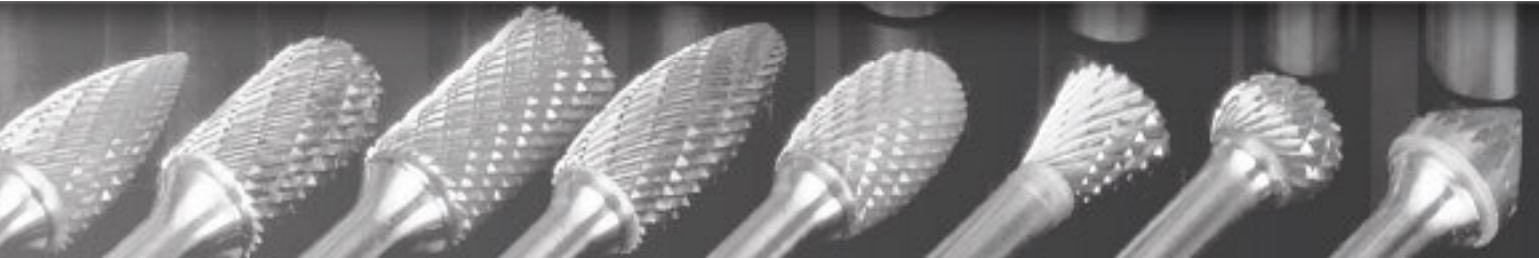


OUR COMMITMENT TO YOU...

- ★ **100% USA MADE PREMIUM INDUSTRIAL QUALITY PRODUCTS**
- ★ **95% ORDER FULFILLMENT**
- ★ **SAME DAY SHIPPING UNTIL 6PM EST**
- ★ **NO MINIMUM ORDER REQUIREMENTS**
- ★ **EXCEPTIONAL QUALITY CONTROL**



ALL TOOLS ARE 100% MADE IN THE USA



HIGH PERFORMANCE TOOLS

Endmills • Taps

SOLID CARBIDE TOOLS

**Endmills • Drill Mills • Drills
Threadmills • Burs • Micro Endmills
Reamers • Countersinks**

HIGH SPEED STEEL TOOLS

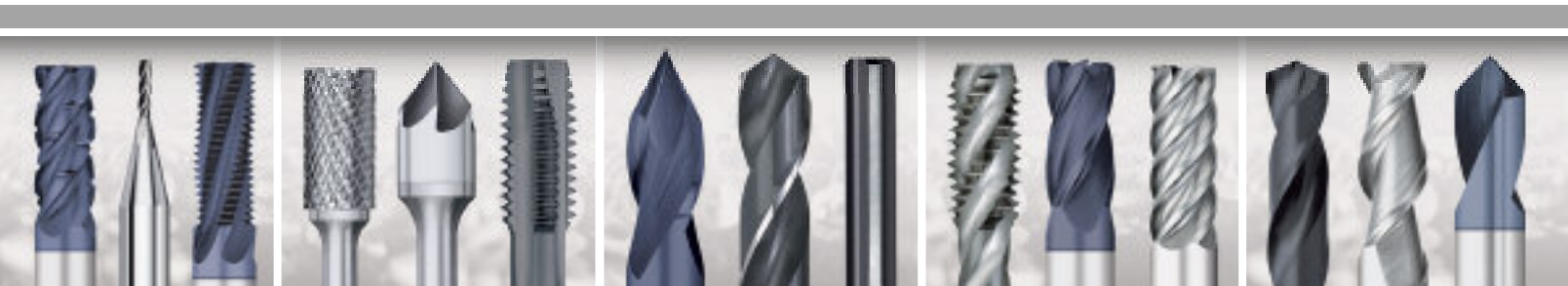
**Drills • Taps & Dies • Reamers
Endmills • Countersinks**

COBALT TOOLS

Drills • Endmills • Reamers



ALL TOOLS ARE 100% MADE IN THE USA



Coating Advantages and Usage

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

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

We currently offer 4 tool coatings:



ALTIN This is a high performance coating for milling, tapping and drilling in stainless steels, carbon steels, alloy steels, titanium and cast iron. This coating is extremely heat resistant and can be used with or without coolant. It is exceptional in abrasive and difficult to machine materials.



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



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



ZRN This 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.





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PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.


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PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.



Solid Carbide Endmills

® CORNER RADIUS - 4 FLUTE - VARIABLE HELIX



STUB LENGTH
ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	® RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/8	2	.015 - .020	148410	36.49
5/16	5/16	7/16	2	.015 - .020	148421	42.88
3/8	3/8	1/2	2	.015 - .020	148432	54.73
1/2	1/2	5/8	2-1/2	.030 - .035	148443	83.02
5/8*	5/8	3/4	3	.030 - .035	148454	144.13
3/4*	3/4	1	3	.030 - .035	148465	207.07
1*	1	1-1/4	3	.030 - .035	148476	342.08

* WITH WELDON FLATS



REGULAR LENGTH
ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	® RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	.015 - .020	148487	41.50
5/16	5/16	13/16	2-1/2	.015 - .020	148498	46.53
3/8	3/8	1	2-1/2	.015 - .020	148509	59.98
1/2	1/2	1-1/4	3	.030 - .035	148520	92.64
5/8*	5/8	1-5/8	3-1/2	.030 - .035	148531	147.55
3/4*	3/4	1-5/8	4	.030 - .035	148542	211.50
1*	1	2	4	.030 - .035	148553	361.16

* WITH WELDON FLATS

This High Performance tool incorporates the ultimate in variable helix geometry for carbide endmills. Our flute configuration results in a harmonics shift, resulting in minimal chatter and an exceptional finish. Great for slotting, roughing, ramping and finishing while reducing cycle time and extending tool life.

Performs very well in a wide range of materials including:
alloy steels, cast iron, stainless steels and titanium alloys.

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



R CORNER RADIUS - LONG LENGTH - 4 FLUTE - VARIABLE HELIX



ALTIM COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/4	1/4	1-1/8	3	.015 - .020	148564	44.66
5/16	5/16	1-1/8	3	.015 - .020	148575	53.75
3/8	3/8	1-1/4	3	.015 - .020	148586	60.75
1/2	1/2	2	4	.030 - .035	148597	112.69
5/8*	5/8	2-1/4	5	.030 - .035	148608	189.87
3/4*	3/4	2-1/4	5	.030 - .035	148619	240.68
1*	1	3	6	.030 - .035	148630	459.05

* WITH WELDON FLATS

This High Performance tool incorporates the ultimate in variable helix geometry for carbide endmills. Our flute configuration results in a harmonics shift, resulting in minimal chatter and an exceptional finish. Great for slotting, roughing, ramping and finishing while reducing cycle time and extending tool life.

Performs very well in a wide range of materials including: alloy steels, cast iron, stainless steels and titanium alloys.

SPEEDS & FEEDS

MATERIALS	LOW ALLOY STEELS DUCTILE STEELS CAST IRONS		STAINLESS STEELS HIGH STRENGTH STEELS MEDIUM ALLOYS COPPER		TITANIUM ALLOYS STAINLESS STEELS HIGH ALLOYS STEELS		HIGH TEMP ALLOYS		
	SIZE	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT
1/4	500 - 600	0.0016	270 - 300	0.0013	270 - 300	0.0013	80 - 110	0.0010	
5/16	500 - 600	0.0021	270 - 300	0.0016	270 - 300	0.0016	80 - 110	0.0011	
3/8	500 - 600	0.0026	270 - 300	0.0020	270 - 300	0.0019	80 - 110	0.0013	
7/16	500 - 600	0.0029	270 - 300	0.0025	270 - 300	0.0020	80 - 110	0.0015	
1/2	500 - 600	0.0030	270 - 300	0.0026	270 - 300	0.0027	80 - 110	0.0017	
5/8	500 - 600	0.0035	270 - 300	0.0030	270 - 300	0.0030	80 - 110	0.0020	
3/4	500 - 600	0.0036	270 - 300	0.0032	270 - 300	0.0032	80 - 110	0.0023	
1	500 - 600	0.0050	270 - 300	0.0034	270 - 300	0.0040	80 - 110	0.0025	

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



Solid Carbide Endmills

6 FLUTE - SQUARE END - 40° HELIX



**REGULAR LENGTH
ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	6	148641	69.67
5/16	5/16	13/16	2-1/2	6	148652	82.76
3/8	3/8	1	2-1/2	6	148663	89.19
7/16	7/16	1	2-3/4	6	148674	109.05
1/2	1/2	1-1/4	3	6	148685	119.23
5/8	5/8	1-5/8	3-1/2	6	148696	198.70
3/4	3/4	1-5/8	4	6	148707	249.41
1	1	2	4	6	148718	382.01



**LONG LENGTH
ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/8	3	6	148817	76.82
5/16	5/16	1-1/8	3	6	148828	89.62
3/8	3/8	1-1/4	3	6	148839	101.87
7/16	7/16	2	4	6	148850	151.92
1/2	1/2	2	4	6	148861	158.43
5/8	5/8	2-1/4	5	6	148872	246.12
3/4	3/4	2-1/4	5	6	148883	307.36
1	1	3	6	6	148894	622.95

SPEEDS & FEEDS

MATERIAL	CARBON STEELS		STAINLESS STEELS		ALLOY STEELS		NICKEL/HIGH TEMP		TITANIUM AND TITANIUM ALLOYS	
	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT
1/4	275 - 750	0.003	90 - 450	0.002	200 - 600	0.0008-0.001	45 - 115	0.0015-0.002	250 - 400	0.001-0.002
3/8	275 - 750	0.003	90 - 450	0.002	200 - 600	0.0008-0.001	45 - 115	0.0015-0.002	250 - 400	0.001-0.002
1/2	275 - 750	0.004	90 - 450	0.0025-0.003	200 - 600	0.001-0.002	45 - 115	0.002-0.0025	250 - 400	0.001-0.0025
5/8	275 - 750	0.005	90 - 450	0.003-0.004	200 - 600	0.0015-0.003	45 - 115	0.002-0.0035	250 - 400	0.002-0.003
3/4	275 - 750	0.006	90 - 450	0.004-0.005	200 - 600	0.002-0.004	45 - 115	0.002-0.004	250 - 400	0.0025-0.004
1	275 - 750	0.007	90 - 450	0.005-0.006	200 - 600	0.003-0.005	45 - 115	0.003-0.005	250 - 400	0.004-0.006

This tool is the latest innovation in carbide endmills. It has radial relief for strength and is offered standard with ALTiN coating for extended tool life. It also has a stronger core for added strength.

Excellent for: high temp alloys, stainless steels, steel alloys
This tool should be run 20 - 50 percent faster than conventional carbide endmills.

TOLERANCES	DIAMETER	SHANK
ALL SIZES	+0.000, -0.002	-.0001, -.0004

HIGH PERFORMANCE - CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

Solid Carbide Endmills



® CORNER RADIUS - 6 FLUTE - 40° HELIX



**REGULAR LENGTH
ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	6	.020	148729	77.78
5/16	5/16	13/16	2-1/2	6	.020	148740	92.40
3/8	3/8	1	2-1/2	6	.040	148751	99.58
7/16	7/16	1	2-3/4	6	.040	148762	121.77
1/2	1/2	1-1/4	3	6	.040	148773	133.12
5/8	5/8	1-5/8	3-1/2	6	.040	148784	212.20
3/4	3/4	1-5/8	4	6	.040	148795	266.37
1	1	2	4	6	.040	148806	407.97



**LONG LENGTH
ALTiN COATED**

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	® RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	6	.020	148905	85.77
5/16	5/16	13/16	2-1/2	6	.020	148916	100.07
3/8	3/8	1	2-1/2	6	.040	148927	113.74
7/16	7/16	1	2-3/4	6	.040	148938	169.62
1/2	1/2	1-1/4	3	6	.040	148949	176.87
5/8	5/8	1-5/8	3-1/2	6	.040	148960	262.85
3/4	3/4	1-5/8	4	6	.040	148971	328.26
1	1	2	4	6	.040	148982	665.28

SPEEDS & FEEDS

MATERIAL	CARBON STEELS		STAINLESS STEELS		ALLOY STEELS		NICKEL/HIGH TEMP		TITANIUM AND TITANIUM ALLOYS	
	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT	SPEED SFM	FEED IPT
1/4	275-750	0.003	90-450	0.002	200-600	0.0008-0.001	45-115	0.0015-0.002	250-400	0.001-0.002
3/8	275-750	0.003	90-450	0.002	200-600	0.0008-0.001	45-115	0.0015-0.002	250-400	0.001-0.002
1/2	275-750	0.004	90-450	0.0025-0.003	200-600	0.001-0.002	45-115	0.002-0.0025	250-400	0.001-0.0025
5/8	275-750	0.005	90-450	0.003-0.004	200-600	0.0015-0.003	45-115	0.002-0.0035	250-400	0.002-0.003
3/4	275-750	0.006	90-450	0.004-0.005	200-600	0.002-0.004	45-115	0.002-0.004	250-400	0.0025-0.004
1	275-750	0.007	90-450	0.005-0.006	200-600	0.003-0.005	45-115	0.003-0.005	250-400	0.004-0.006

This tool is the latest innovation in carbide endmills. It has radial relief for strength and is offered standard with ALTiN coating for extended tool life. It also has a stronger core for added strength.

Excellent for: high temp alloys, stainless steels, steel alloys
This tool should be run 20 - 50 percent faster than conventional carbide endmills.

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



Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143064	18.08
3/16	3/16	5/8	2	3	143075	21.64
1/4	1/4	3/4	2-1/2	3	143086	23.21
5/16	5/16	13/16	2-1/2	3	143097	28.07
3/8	3/8	7/8	2-1/2	3	143108	37.58
1/2	1/2	1-1/4	3	3	143119	64.11
5/8	5/8	1-5/8	3-1/2	3	143130	127.60
3/4	3/4	1-5/8	4	3	143141	179.09

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143240	22.59
3/16	3/16	5/8	2	3	143251	27.04
1/4	1/4	3/4	2-1/2	3	143262	29.01
5/16	5/16	13/16	2-1/2	3	143273	35.08
3/8	3/8	7/8	2-1/2	3	143284	46.98
1/2	1/2	1-1/4	3	3	143295	80.14
5/8	5/8	1-5/8	3-1/2	3	143306	159.51
3/4	3/4	1-5/8	4	3	143317	223.85

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143152	20.18
3/16	3/16	5/8	2	3	.010	143163	24.16
1/4	1/4	3/4	2-1/2	3	.020	143174	25.92
5/16	5/16	13/16	2-1/2	3	.020	143185	31.34
3/8	3/8	7/8	2-1/2	3	.020	143196	41.97
1/2	1/2	1-1/4	3	3	.040	143207	71.58
5/8	5/8	1-5/8	3-1/2	3	.040	143218	136.28
3/4	3/4	1-5/8	4	3	.040	143229	191.25

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143328	25.23
3/16	3/16	5/8	2	3	.010	143339	30.20
1/4	1/4	3/4	2-1/2	3	.020	143350	32.39
5/16	5/16	13/16	2-1/2	3	.020	143361	39.16
3/8	3/8	7/8	2-1/2	3	.020	143372	52.46
1/2	1/2	1-1/4	3	3	.040	143383	89.47
5/8	5/8	1-5/8	3-1/2	3	.040	143394	170.34
3/4	3/4	1-5/8	4	3	.040	143405	239.06

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

TOLERANCES	DIAMETER	SHANK	RADIUS
1/8" - 1/2"	+0.00, -.002	-.0001, -.0004	+0.02, -.002
5/8" - 3/4"	+0.00, -.003	-.0001, -.0004	+0.02, -.002

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



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	18.08
3/16	3/16	5/8	2	3	143427	21.64
1/4	1/4	3/4	2-1/2	3	143438	23.21
5/16	5/16	13/16	2-1/2	3	143449	28.07
3/8	3/8	7/8	2-1/2	3	143460	37.58
1/2	1/2	1-1/4	3	3	143471	64.11
5/8	5/8	1-5/8	3-1/2	3	143482	127.60
3/4	3/4	1-5/8	4	3	143493	179.09

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	143592	22.59
3/16	3/16	5/8	2	3	143603	27.04
1/4	1/4	3/4	2-1/2	3	143614	29.01
5/16	5/16	13/16	2-1/2	3	143625	35.08
3/8	3/8	7/8	2-1/2	3	143636	46.98
1/2	1/2	1-1/4	3	3	143647	80.14
5/8	5/8	1-5/8	3-1/2	3	143658	159.51
3/4	3/4	1-5/8	4	3	143669	223.85

R CORNER RADIUS - REGULAR LENGTH - 3 FLUTE - 45° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143504	20.18
3/16	3/16	5/8	2	3	.010	143515	24.16
1/4	1/4	3/4	2-1/2	3	.020	143526	25.92
5/16	5/16	13/16	2-1/2	3	.020	143537	31.34
3/8	3/8	7/8	2-1/2	3	.020	143548	41.97
1/2	1/2	1-1/4	3	3	.040	143559	71.58
5/8	5/8	1-5/8	3-1/2	3	.040	143570	136.28
3/4	3/4	1-5/8	4	3	.040	143581	191.25

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.010	143680	25.23
3/16	3/16	5/8	2	3	.010	143691	30.20
1/4	1/4	3/4	2-1/2	3	.020	143702	32.39
5/16	5/16	13/16	2-1/2	3	.020	143713	39.16
3/8	3/8	7/8	2-1/2	3	.020	143724	52.46
1/2	1/2	1-1/4	3	3	.040	143735	89.47
5/8	5/8	1-5/8	3-1/2	3	.040	143746	170.34
3/4	3/4	1-5/8	4	3	.040	143757	239.06

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

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



Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	148993	8.85
3/16	3/16	3/8	2	5	149004	15.51
1/4	1/4	1/2	2	5	149015	18.70
5/16	5/16	1/2	2	5	149026	22.46
3/8	3/8	5/8	2	5	149037	36.95
7/16	7/16	5/8	2-1/2	5	149048	42.24
1/2	1/2	5/8	2-1/2	5	149059	48.80
5/8	5/8	3/4	3	5	149070	86.67
3/4	3/4	1	3	5	149081	116.77

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	149092	11.17
3/16	3/16	3/8	2	5	149103	18.57
1/4	1/4	1/2	2	5	149114	22.23
5/16	5/16	1/2	2	5	149125	28.07
3/8	3/8	5/8	2	5	149136	43.98
7/16	7/16	5/8	2-1/2	5	149147	50.30
1/2	1/2	5/8	2-1/2	5	149158	58.13
5/8	5/8	3/4	3	5	149169	104.91
3/4	3/4	1	3	5	149180	144.13

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	.010	149191	9.88
3/16	3/16	3/8	2	5	.010	149202	17.32
1/4	1/4	1/2	2	5	.020	149213	20.88
5/16	5/16	1/2	2	5	.020	149224	25.08
3/8	3/8	5/8	2	5	.020	149235	41.25
7/16	7/16	5/8	2-1/2	5	.020	149246	47.17
1/2	1/2	5/8	2-1/2	5	.040	149257	54.49
5/8	5/8	3/4	3	5	.040	149268	92.55
3/4	3/4	1	3	5	.040	149279	124.71

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/4	1-1/2	5	.010	149290	12.47
3/16	3/16	3/8	2	5	.010	149301	20.73
1/4	1/4	1/2	2	5	.020	149312	24.83
5/16	5/16	1/2	2	5	.020	149323	31.34
3/8	3/8	5/8	2	5	.020	149334	49.11
7/16	7/16	5/8	2-1/2	5	.020	149345	56.17
1/2	1/2	5/8	2-1/2	5	.040	149356	64.90
5/8	5/8	3/4	3	5	.040	149367	112.03
3/4	3/4	1	3	5	.040	149378	153.93

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

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	149389	18.86
3/16	3/16	3/4	2	5	149400	23.72
1/4	1/4	3/4	2-1/2	5	149411	25.54
5/16	5/16	7/8	2-1/2	5	149422	30.82
3/8	3/8	7/8	2-1/2	5	149433	41.23
1/2	1/2	1-1/4	3	5	149444	76.99
5/8	5/8	1-5/8	3-1/2	5	149455	145.96
3/4	3/4	1-5/8	4	5	149466	205.25

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	149477	23.58
3/16	3/16	3/4	2	5	149488	28.26
1/4	1/4	3/4	2-1/2	5	149499	30.41
5/16	5/16	7/8	2-1/2	5	149510	36.63
3/8	3/8	7/8	2-1/2	5	149521	49.12
1/2	1/2	1-1/4	3	5	149532	95.78
5/8	5/8	1-5/8	3-1/2	5	149543	185.18
3/4	3/4	1-5/8	4	5	149554	251.78

R CORNER RADIUS - REGULAR LENGTH - 5 FLUTE - 45° HELIX



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	.010	150181	21.06
3/16	3/16	3/4	2	5	.010	150192	26.49
1/4	1/4	3/4	2-1/2	5	.020	150203	28.52
5/16	5/16	7/8	2-1/2	5	.020	150214	34.40
3/8	3/8	7/8	2-1/2	5	.020	150225	46.04
1/2	1/2	1-1/4	3	5	.040	150236	85.96
5/8	5/8	1-5/8	3-1/2	5	.040	150247	155.88
3/4	3/4	1-5/8	4	5	.040	150258	219.20

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	5	.010	150269	26.33
3/16	3/16	3/4	2	5	.010	150280	31.54
1/4	1/4	3/4	2-1/2	5	.020	150291	33.95
5/16	5/16	7/8	2-1/2	5	.020	150302	40.90
3/8	3/8	7/8	2-1/2	5	.020	150313	54.84
1/2	1/2	1-1/4	3	5	.040	150324	106.94
5/8	5/8	1-5/8	3-1/2	5	.040	150335	197.76
3/4	3/4	1-5/8	4	5	.040	150346	268.88

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

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



Solid Carbide Endmills

FOR ALUMINUM

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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	149560	17.75
3/16	3/16	5/8	2	2	148562	24.74
1/4	1/4	3/4	2-1/2	2	149565	35.69
5/16	5/16	13/16	2-1/2	2	149576	42.14
3/8	3/8	1	2-1/2	2	149587	44.63
1/2	1/2	1-1/4	3	2	149598	73.86
5/8	5/8	1-5/8	3-1/2	2	149609	141.29
3/4	3/4	1-3/4	4	2	149620	202.51
1	1	1-3/4	4	2	149631	333.88

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	149638	22.18
3/16	3/16	5/8	2	2	149640	30.93
1/4	1/4	3/4	2-1/2	2	149642	43.15
5/16	5/16	13/16	2-1/2	2	149653	50.97
3/8	3/8	1	2-1/2	2	149664	53.94
1/2	1/2	1-1/4	3	2	149675	85.66
5/8	5/8	1-5/8	3-1/2	2	149686	171.22
3/4	3/4	1-3/4	4	2	149697	245.93
1	1	1-3/4	4	2	149708	404.81

FOR ALUMINUM

R CORNER RADIUS - REGULAR LENGTH - 2 FLUTE - 45° HELIX



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	.020	150351	21.21
3/16	3/16	5/8	2	2	.020	150353	29.09
1/4	1/4	3/4	2-1/2	2	.020	150357	39.86
5/16	5/16	13/16	2-1/2	2	.020	150368	47.07
3/8	3/8	1	2-1/2	2	.020	150379	49.83
1/2	1/2	1-1/4	3	2	.040	150390	82.46
5/8	5/8	1-5/8	3-1/2	2	.040	150401	150.88
3/4	3/4	1-3/4	4	2	.040	150412	216.29
1	1	1-3/4	4	2	.040	150423	356.56

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	2	.020	150430	26.51
3/16	3/16	5/8	2	2	.020	150432	36.36
1/4	1/4	3/4	2-1/2	2	.020	150434	48.17
5/16	5/16	13/16	2-1/2	2	.020	150445	56.92
3/8	3/8	1	2-1/2	2	.020	150456	60.22
1/2	1/2	1-1/4	3	2	.040	150467	95.64
5/8	5/8	1-5/8	3-1/2	2	.040	150478	182.86
3/4	3/4	1-3/4	4	2	.040	150489	262.64
1	1	1-3/4	4	2	.040	150500	432.32

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

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

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	149869	30.13
3/16	3/16	3/4	2-1/2	2	149871	34.75
1/4	1/4	1-1/4	3	2	149873	48.98
5/16	5/16	1-3/8	3	2	149884	63.42
3/8	3/8	1-1/2	4	2	149895	79.45
1/2	1/2	2	4	2	149906	111.30
5/8	5/8	2-3/8	5	2	149917	230.79
3/4	3/4	2-1/2	5	2	149928	253.60
1	1	2-1/4	5	2	149939	416.89

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	149946	37.67
3/16	3/16	3/4	2-1/2	2	149948	43.43
1/4	1/4	1-1/4	3	2	149950	59.20
5/16	5/16	1-3/8	3	2	149961	80.54
3/8	3/8	1-1/2	4	2	149972	96.09
1/2	1/2	2	4	2	149983	134.96
5/8	5/8	2-3/8	5	2	149994	293.74
3/4	3/4	2-1/2	5	2	150005	317.45
1	1	2-1/4	5	2	150016	499.91

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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	2	.020	150507	36.15
3/16	3/16	3/4	2-1/2	2	.020	150509	41.70
1/4	1/4	1-1/4	3	2	.020	150511	54.69
5/16	5/16	1-3/8	3	2	.020	150522	70.81
3/8	3/8	1-1/2	4	2	.020	150533	88.70
1/2	1/2	2	4	2	.040	150544	124.25
5/8	5/8	2-3/8	5	2	.040	150555	246.48
3/4	3/4	2-1/2	5	2	.040	150566	270.83
1	1	2-1/4	5	2	.040	150577	445.23

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	.020	150584	45.19
3/16	3/16	3/4	2-1/2	2	.020	150586	52.13
1/4	1/4	1-1/4	3	2	.020	150588	66.11
5/16	5/16	1-3/8	3	2	.020	150599	89.91
3/8	3/8	1-1/2	4	2	.020	150610	107.28
1/2	1/2	2	4	2	.040	150621	150.70
5/8	5/8	2-3/8	5	2	.040	150632	313.70
3/4	3/4	2-1/2	5	2	.040	150643	339.03
1	1	2-1/4	5	2	.040	150654	533.88

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

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

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



Solid Carbide Endmills

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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	149715	17.75
3/16	3/16	5/8	2	3	149717	24.74
1/4	1/4	3/4	2-1/2	3	149719	35.69
5/16	5/16	13/16	2-1/2	3	149730	42.14
3/8	3/8	1	2-1/2	3	149741	44.63
1/2	1/2	1-1/4	3	3	149752	73.86
5/8	5/8	1-5/8	3-1/2	3	149763	141.29
3/4	3/4	1-3/4	4	3	149774	202.51
1	1	1-3/4	4	3	149785	333.88

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	149792	22.18
3/16	3/16	5/8	2	3	149794	30.93
1/4	1/4	3/4	2-1/2	3	149796	43.15
5/16	5/16	13/16	2-1/2	3	149807	50.97
3/8	3/8	1	2-1/2	3	149818	53.94
1/2	1/2	1-1/4	3	3	149829	85.66
5/8	5/8	1-5/8	3-1/2	3	149840	171.22
3/4	3/4	1-3/4	4	3	149851	245.93
1	1	1-3/4	4	3	149862	404.81

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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.020	150661	21.21
3/16	3/16	5/8	2	3	.020	150663	29.09
1/4	1/4	3/4	2-1/2	3	.020	150665	39.86
5/16	5/16	13/16	2-1/2	3	.020	150676	47.07
3/8	3/8	1	2-1/2	3	.020	150687	49.83
1/2	1/2	1-1/4	3	3	.040	150698	82.46
5/8	5/8	1-5/8	3-1/2	3	.040	150709	150.88
3/4	3/4	1-3/4	4	3	.040	150720	216.29
1	1	1-3/4	4	3	.040	150731	356.56

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	R CORNER RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	3	.020	150738	26.51
3/16	3/16	5/8	2	3	.020	150740	36.36
1/4	1/4	3/4	2-1/2	3	.020	150742	48.17
5/16	5/16	13/16	2-1/2	3	.020	150753	56.92
3/8	3/8	1	2-1/2	3	.020	150764	60.22
1/2	1/2	1-1/4	3	3	.040	150775	95.64
5/8	5/8	1-5/8	3-1/2	3	.040	150786	182.86
3/4	3/4	1-3/4	4	3	.040	150797	262.64
1	1	1-3/4	4	3	.040	150808	432.32

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

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

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	150023	30.13
3/16	3/16	3/4	2-1/2	3	150025	34.75
1/4	1/4	1-1/4	3	3	150027	48.98
5/16	5/16	1-3/8	3	3	150038	63.42
3/8	3/8	1-1/2	4	3	150049	79.45
1/2	1/2	2	4	3	150060	111.30
5/8	5/8	2-3/8	5	3	150071	230.79
3/4	3/4	2-1/2	5	3	150082	253.60
1	1	2-1/4	5	3	150093	416.89

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	150100	37.60
3/16	3/16	3/4	2-1/2	3	150102	43.43
1/4	1/4	1-1/4	3	3	150104	59.20
5/16	5/16	1-3/8	3	3	150115	80.54
3/8	3/8	1-1/2	4	3	150126	96.09
1/2	1/2	2	4	3	150137	134.96
5/8	5/8	2-3/8	5	3	150148	293.74
3/4	3/4	2-1/2	5	3	150159	317.45
1	1	2-1/4	5	3	150170	499.91

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



UNCOATED



ZRN (ZIRCONIUM NITRIDE) COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	.020	150815	36.15
3/16	3/16	3/4	2-1/2	3	.020	150817	41.70
1/4	1/4	1-1/4	3	3	.020	150819	54.69
5/16	5/16	1-3/8	3	3	.020	150830	70.81
3/8	3/8	1-1/2	4	3	.020	150841	88.70
1/2	1/2	2	4	3	.040	150852	124.25
5/8	5/8	2-3/8	5	3	.040	150863	246.48
3/4	3/4	2-1/2	5	3	.040	150874	270.83
1	1	2-1/4	5	3	.040	150885	445.23

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	3	.020	150892	45.19
3/16	3/16	3/4	2-1/2	3	.020	150894	52.13
1/4	1/4	1-1/4	3	3	.020	150896	66.11
5/16	5/16	1-3/8	3	3	.020	150907	89.91
3/8	3/8	1-1/2	4	3	.020	150918	107.28
1/2	1/2	2	4	3	.040	150929	150.70
5/8	5/8	2-3/8	5	3	.040	150940	313.70
3/4	3/4	2-1/2	5	3	.040	150951	339.03
1	1	2-1/4	5	3	.040	150962	533.88

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

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

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



Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	142756	37.80
5/16	5/16	13/16	2-1/2	4	142767	53.06
3/8	3/8	7/8	2-1/2	4	142778	61.90
1/2	1/2	1-1/4	3	4	142789	77.38
5/8	5/8	1-5/8	3-1/2	4	142800	167.14
3/4	3/4	1-5/8	4	4	142811	200.57
1	1	2	4	4	142822	372.49

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	142833	47.24
5/16	5/16	13/16	2-1/2	4	142844	66.33
3/8	3/8	7/8	2-1/2	4	142855	77.38
1/2	1/2	1-1/4	3	4	142866	96.71
5/8	5/8	1-5/8	3-1/2	4	142877	208.93
3/4	3/4	1-5/8	4	4	142888	250.72
1	1	2	4	4	142899	465.61

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	217281	54.63
5/16	5/16	1-1/2	4	4	217292	70.06
3/8	3/8	1-3/4	4	4	217303	87.57
1/2	1/2	2	4	4	217314	99.22
5/8	5/8	2-1/2	5	4	217325	237.00
3/4	3/4	2-1/2	5	4	217336	285.21
1	1	2-1/2	5	4	217347	478.02

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
1/4	1/4	1-1/2	4	4	218645	68.29
5/16	5/16	1-1/2	4	4	218656	87.57
3/8	3/8	1-3/4	4	4	218667	109.47
1/2	1/2	2	4	4	218678	124.12
5/8	5/8	2-1/2	5	4	218689	297.66
3/4	3/4	2-1/2	5	4	218700	357.51
1	1	2-1/2	5	4	218711	598.53

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

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

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

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

HIGH PERFORMANCE - CARBIDE ENDMILLS

Solid Carbide Endmills



ROUGHER / FINISHER - REGULAR LENGTH - 4 FLUTE - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	.020	142910	66.10
5/16	5/16	13/16	2-1/2	4	.020	142921	71.57
3/8	3/8	7/8	2-1/2	4	.020	142932	77.77
1/2	1/2	1-1/4	3	4	.040	142943	89.90
5/8*	5/8	1-5/8	3-1/2	4	.040	142954	179.00
3/4*	3/4	1-5/8	4	4	.040	142965	239.16
1*	1	1-5/8	4	4	.040	142976	390.29

* WITH WELDON FLATS



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	R RADIUS	ITEM#	LIST PRICE
1/4	1/4	3/4	2-1/2	4	.020	142987	82.61
5/16	5/16	13/16	2-1/2	4	.020	142998	89.47
3/8	3/8	7/8	2-1/2	4	.020	143009	97.22
1/2	1/2	1-1/4	3	4	.040	143020	112.37
5/8*	5/8	1-5/8	3-1/2	4	.040	143031	223.77
3/4*	3/4	1-5/8	4	4	.040	143042	298.94
1*	1	1-5/8	4	4	.040	143053	487.87

* WITH WELDON FLATS

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

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

SOLID CARBIDE ROUGHERS - SPEEDS & FEEDS

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

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



Solid Carbide Endmills

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

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	20.06	166329	26.90	163854	26.90
1/32	1/8	1/8	1-1/2	130722	13.45	166340	18.16	163865	18.16
3/64	1/8	1/8	1-1/2	130733	11.48	166351	15.49	163876	15.49
1/16	1/8	1/4	1-1/2	130744	11.46	166362	13.15	163887	13.15
5/64	1/8	1/4	1-1/2	130755	11.82	166373	15.97	163898	15.97
3/32	1/8	3/8	1-1/2	130766	10.42	166384	13.15	163909	13.15
7/64	1/8	3/8	1-1/2	130777	10.85	166395	14.65	163920	14.65
1/8	1/8	1/2	1-1/2	130788	9.98	166406	12.23	163931	12.23
9/64	3/16	9/16	2	130799	14.62	166417	19.75	163942	19.75
5/32	3/16	9/16	2	130810	14.72	166428	17.08	163953	17.08
11/64	3/16	5/8	2	130821	13.99	166439	18.89	163964	18.89
3/16	3/16	5/8	2	130832	13.62	166450	17.08	163975	17.08
13/64	1/4	5/8	2-1/2	130843	19.85	166461	26.04	163986	26.04
7/32	1/4	5/8	2-1/2	130854	20.28	166472	23.57	163997	23.57
15/64	1/4	3/4	2-1/2	130865	22.93	166483	29.54	164008	29.54
1/4	1/4	3/4	2-1/2	130876	16.82	166494	23.57	164019	23.57
17/64	5/16	3/4	2-1/2	130887	30.30	166505	38.95	164030	38.95
9/32	5/16	3/4	2-1/2	130898	30.30	166516	38.95	164041	38.95
19/64	5/16	13/16	2-1/2	130909	30.30	166527	38.95	164052	38.95
5/16	5/16	13/16	2-1/2	130920	21.89	166538	28.22	164063	28.22
21/64	3/8	1	2-1/2	130931	33.98	166549	43.69	164074	43.69
11/32	3/8	1	2-1/2	130942	33.98	166560	43.69	164085	43.69
23/64	3/8	1	2-1/2	130953	33.98	166571	43.69	164096	43.69
3/8	3/8	1	2-1/2	130964	26.09	166582	32.27	164107	32.27
25/64	7/16	1	2-3/4	130975	44.48	166593	57.43	164118	57.43
13/32	7/16	1	2-3/4	130986	44.48	166604	57.43	164129	57.43
27/64	7/16	1	2-3/4	130997	45.93	166615	59.31	164140	59.31
7/16	7/16	1	2-3/4	131008	40.06	166626	49.31	164151	49.31
29/64	1/2	1	3	131019	66.13	166637	84.63	164162	84.63
15/32	1/2	1	3	131030	66.13	166648	84.63	164173	84.63
31/64	1/2	1	3	131041	66.13	166659	84.63	164184	84.63
1/2	1/2	1	3	131052	48.08	166670	59.99	164195	59.99
1/2	1/2	1-1/4	3	131063	48.08	166681	59.99	164206	59.99
9/16	9/16	1-1/4	3-1/2	131074	90.87	166692	120.00	164217	120.00
5/8	5/8	1-1/4	3-1/2	131085	91.93	166703	117.19	164228	117.19
3/4	3/4	1-1/2	4	131096	129.12	166714	166.31	164239	166.31
7/8	7/8	1-1/2	4	131107	236.15	166725	298.91	164250	298.91
1	1	1-1/2	4	131118	211.22	166736	270.16	164261	270.16
1-1/4	1-1/4	2	4-1/2	131129	742.21	166747	843.41	164272	843.41

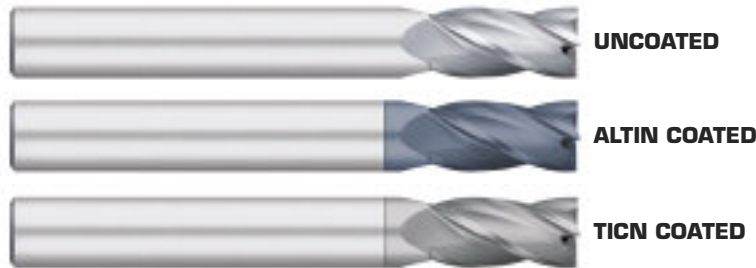
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -.0004
1/8" - 1/2"	+0.00, -0.02	-0.001, -.0004
9/16" - 1-1/4"	+0.00, -0.03	-0.001, -.0004

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

Solid Carbide Endmills



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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	3/4	2-1/4	136442	16.13	136596	20.74	165251	20.74
3/16	3/16	3/4	2-1/2	136453	18.94	136607	24.34	165262	24.34
1/4	1/4	1-1/8	3	136464	27.11	136618	34.94	165273	34.94
1/4	1/4	1	4	136475	28.56	136629	36.83	165284	36.83
5/16	5/16	1-1/8	3	136486	30.60	136640	41.30	165295	41.30
3/8	3/8	1-1/8	3	136497	35.10	136651	47.38	165306	47.38
3/8	3/8	1	4	136508	40.98	136662	52.74	165317	52.74
7/16	7/16	2	4	136519	55.30	136673	71.90	165328	71.90
1/2	1/2	1	4	136530	59.87	136684	77.12	165339	77.12
1/2	1/2	2	4	136541	63.44	136695	81.40	165350	81.40
5/8	5/8	2-1/4	5	136552	141.75	136706	175.43	165361	175.43
3/4	3/4	2-1/4	5	136563	195.78	136717	252.62	165372	252.62
7/8	7/8	2-1/4	5	136574	371.10	136728	438.58	165383	438.58
1	1	2-1/4	5	136585	268.06	136739	345.95	165394	345.95

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	1	3	137674	18.03	137850	24.34	165867	24.34
3/16	3/16	1-1/8	3	137685	19.62	137861	25.19	165878	25.19
1/4	1/4	1-1/2	4	137696	27.70	137872	35.69	165889	35.69
1/4	1/4	1-1/2	6	137707	37.47	137883	48.19	165900	48.19
5/16	5/16	1-5/8	4	137718	37.82	137894	48.80	165911	48.80
3/8	3/8	1-3/4	4	137729	42.94	137905	54.99	165922	54.99
3/8	3/8	1-1/2	6	137740	65.02	137916	83.79	165933	83.79
7/16	7/16	3	6	137751	87.55	137927	112.28	165944	112.28
1/2	1/2	1-1/2	6	137762	98.94	137938	122.80	165955	122.80
1/2	1/2	3	6	137773	103.85	137949	127.72	165966	127.72
5/8	5/8	3	6	137784	152.98	137960	188.06	165977	188.06
3/4	3/4	3	6	137795	227.36	137971	279.29	165988	279.29
3/4	3/4	4	7	137806	390.16	137982	468.05	165993	468.05
7/8	7/8	3	6	137817	404.84	137993	506.05	165999	506.05
1	1	3	6	137828	385.95	138004	474.28	166010	474.28
1	1	4	7	137839	505.94	138015	621.02	166013	621.02

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



Solid Carbide Endmills

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	22.48	133186	30.10	164690	30.10
1/32	1/8	1/8	1-1/2	132790	14.37	133197	18.67	164701	18.67
3/64	1/8	1/8	1-1/2	132801	14.37	133208	18.67	164712	18.67
1/16	1/8	1/4	1-1/2	132812	13.33	133219	17.99	164723	17.99
5/64	1/8	1/4	1-1/2	132823	13.33	133230	17.99	164734	17.99
3/32	1/8	3/8	1-1/2	132834	13.99	133241	18.89	164745	18.89
7/64	1/8	3/8	1-1/2	132845	13.99	133252	18.89	164756	18.89
1/8	1/8	1/2	1-1/2	132856	12.82	133263	17.31	164767	17.31
9/64	3/16	9/16	2	132867	18.80	133274	25.38	164778	25.38
5/32	3/16	9/16	2	132878	18.80	133285	25.38	164789	25.38
11/64	3/16	5/8	2	132889	18.80	133296	25.38	164800	25.38
3/16	3/16	5/8	2	132900	16.90	133307	22.81	164811	22.81
13/64	1/4	5/8	2-1/2	132911	21.91	133318	31.05	164822	31.05
7/32	1/4	5/8	2-1/2	132922	21.91	133329	31.05	164833	31.05
15/64	1/4	3/4	2-1/2	132933	21.91	133340	31.05	164844	31.05
1/4	1/4	3/4	2-1/2	132944	22.96	133351	29.59	164855	29.59
17/64	5/16	3/4	2-1/2	132955	31.05	133362	39.92	164866	39.92
9/32	5/16	3/4	2-1/2	132966	31.11	133373	39.99	164877	39.99
19/64	5/16	13/16	2-1/2	132977	33.80	133384	44.36	164888	44.36
5/16	5/16	13/16	2-1/2	132988	28.61	133395	36.79	164899	36.79
21/64	3/8	1	2-1/2	132999	39.31	133406	53.06	164910	53.06
11/32	3/8	1	2-1/2	133010	41.27	133417	53.06	164921	53.06
23/64	3/8	1	2-1/2	133021	39.31	133428	53.06	164932	53.06
3/8	3/8	1	2-1/2	133032	30.62	133439	43.28	164943	43.28
25/64	7/16	1	2-3/4	133043	53.24	133450	68.59	164954	68.59
13/32	7/16	1	2-3/4	133054	53.24	133461	68.59	164965	68.59
27/64	7/16	1	2-3/4	133065	53.24	133472	68.59	164976	68.59
7/16	7/16	1	2-3/4	133076	45.32	133483	58.42	164987	58.42
29/64	1/2	1	3	133087	70.18	133494	90.51	164998	90.51
15/32	1/2	1	3	133098	70.18	133505	90.51	165009	90.51
31/64	1/2	1	3	133109	70.18	133516	90.51	165020	90.51
1/2	1/2	1	3	133120	62.16	133527	80.10	165031	80.10
9/16	9/16	1-1/4	3-1/2	133131	94.73	133538	116.59	165042	116.59
5/8	5/8	1-1/4	3-1/2	133142	100.50	133549	129.53	165053	129.53
3/4	3/4	1-1/2	4	133153	148.06	133560	192.97	165064	192.97
7/8	7/8	1-1/2	4	133164	286.76	133571	364.36	165075	364.36
1	1	1-1/2	4	133175	264.49	133582	340.82	165086	340.82

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

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

Solid Carbide Endmills



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



UNCOATED



ALTiN COATED



TiCN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	3/4	2-1/4	137058	19.18	137212	24.67	165559	24.67
3/16	3/16	3/4	2-1/2	137069	22.06	137223	28.37	165570	28.37
1/4	1/4	1-1/8	3	137080	31.04	137234	39.95	165581	39.95
1/4	1/4	1	4	137091	34.27	137245	44.17	165592	44.17
5/16	5/16	1-1/8	3	137102	36.50	137256	49.27	165603	49.27
3/8	3/8	1-1/8	3	137113	42.15	137267	56.90	165614	56.90
3/8	3/8	1	4	137124	51.61	137278	67.09	165625	67.09
7/16	7/16	2	4	137135	70.60	137289	91.78	165636	91.78
1/2	1/2	1	4	137146	72.28	137300	91.93	165647	91.93
1/2	1/2	2	4	137157	72.98	137311	92.63	165658	92.63
5/8	5/8	2-1/4	5	137168	166.31	137322	211.22	165669	211.22
3/4	3/4	2-1/4	5	137179	231.57	137333	293.32	165680	293.32
7/8	7/8	2-1/4	5	137190	398.09	137344	489.19	165691	489.19
1	1	2-1/4	5	137201	458.22	137355	563.48	165702	563.48

EXTRA LONG 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
1/8	1/8	1	3	138334	21.47	138510	28.99	166175	28.99
3/16	3/16	1-1/8	3	138345	23.52	138521	30.25	166186	30.25
1/4	1/4	1-1/2	4	138356	31.73	138532	40.81	166197	40.81
1/4	1/4	1-1/2	6	138367	38.35	138543	49.32	166208	49.32
5/16	5/16	1-5/8	4	138378	45.61	138554	58.88	166219	58.88
3/8	3/8	1-3/4	4	138389	49.12	138565	62.77	166230	62.77
3/8	3/8	1-1/2	6	138400	69.19	138576	86.31	166241	86.31
7/16	7/16	3	6	138411	103.85	138587	133.33	166252	133.33
1/2	1/2	1-1/2	6	138422	110.17	138598	141.05	166263	141.05
1/2	1/2	3	6	138433	110.87	138609	143.15	166274	143.15
5/8	5/8	3	6	138444	174.73	138620	214.72	166285	214.72
3/4	3/4	3	6	138455	247.79	138631	334.51	166296	334.51
3/4	3/4	4	7	138466	408.00	138642	516.00	166303	516.00
7/8	7/8	3	6	138477	438.58	138653	546.53	166307	546.53
1	1	3	6	138488	442.09	138664	569.14	166318	569.14
1	1	4	7	138499	534.71	138675	636.81	166323	636.81

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



Solid Carbide Endmills

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	20.06	129974	26.90	163447	26.90
1/32	1/8	1/8	1-1/2	129578	13.45	129985	18.16	163458	18.16
3/64	1/8	1/8	1-1/2	129589	11.48	129996	15.49	163469	15.49
1/16	1/8	1/4	1-1/2	129600	11.46	130007	13.15	163480	13.15
5/64	1/8	1/4	1-1/2	129611	11.82	130018	15.97	163491	15.97
3/32	1/8	3/8	1-1/2	129622	10.42	130029	13.15	163502	13.15
7/64	1/8	3/8	1-1/2	129633	10.85	130040	14.65	163513	14.65
1/8	1/8	1/2	1-1/2	129644	9.98	130051	12.23	163524	12.23
9/64	3/16	9/16	2	129655	14.62	130062	19.75	163535	19.75
5/32	3/16	9/16	2	129666	14.72	130073	17.08	163546	17.08
11/64	3/16	5/8	2	129677	13.99	130084	18.89	163557	18.89
3/16	3/16	5/8	2	129688	13.62	130095	17.08	163568	17.08
13/64	1/4	5/8	2-1/2	129699	19.85	130106	26.04	163579	26.04
7/32	1/4	5/8	2-1/2	129710	20.28	130117	23.57	163590	23.57
15/64	1/4	3/4	2-1/2	129721	22.93	130128	29.54	163601	29.54
1/4	1/4	3/4	2-1/2	129732	16.82	130139	23.57	163612	23.57
17/64	5/16	3/4	2-1/2	129743	30.30	130150	38.95	163623	38.95
9/32	5/16	3/4	2-1/2	129754	30.30	130161	38.95	163634	38.95
19/64	5/16	13/16	2-1/2	129765	30.30	130172	38.95	163645	38.95
5/16	5/16	13/16	2-1/2	129776	21.89	130183	28.22	163656	28.22
21/64	3/8	1	2-1/2	129787	33.98	130194	43.69	163667	43.69
11/32	3/8	1	2-1/2	129798	33.98	130205	43.69	163678	43.69
23/64	3/8	1	2-1/2	129809	33.98	130216	43.69	163689	43.69
3/8	3/8	1	2-1/2	129820	26.09	130227	32.27	163700	32.27
25/64	7/16	1	2-3/4	129831	44.48	130238	57.43	163711	57.43
13/32	7/16	1	2-3/4	129842	44.48	130249	57.43	163722	57.43
27/64	7/16	1	2-3/4	129853	45.93	130260	59.31	163733	59.31
7/16	7/16	1	2-3/4	129864	40.06	130271	49.31	163744	49.31
29/64	1/2	1	3	129875	66.13	130282	84.63	163755	84.63
15/32	1/2	1	3	129886	66.13	130293	84.63	163766	84.63
31/64	1/2	1	3	129897	66.13	130304	84.63	163777	84.63
1/2	1/2	1	3	129908	48.08	130315	59.99	163788	59.99
9/16	9/16	1-1/4	3-1/2	129919	90.87	130326	120.00	163799	120.00
5/8	5/8	1-1/4	3-1/2	129930	91.93	130337	117.19	163810	117.19
3/4	3/4	1-1/2	4	129941	129.12	130348	166.31	163821	166.31
7/8	7/8	1-1/2	4	129952	236.15	130359	298.91	163832	298.91
1	1	1-1/2	4	129963	211.22	130370	270.16	163843	270.16

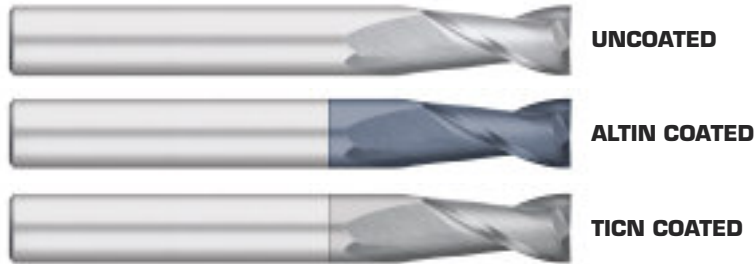
TOLERANCES	DIAMETER	SHANK
1/64" - 7/64"	+0.00, -0.01	-0.001, -0.004
1/8" - 1/2"	+0.00, -0.02	-0.001, -0.004
9/16" - 1"	+0.00, -0.03	-0.001, -0.004

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

Solid Carbide Endmills



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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	3/4	2-1/4	136134	16.13	136288	20.74	165097	20.74
3/16	3/16	3/4	2-1/2	136145	18.94	136299	24.34	165108	24.34
1/4	1/4	1-1/8	3	136156	27.11	136310	34.94	165119	34.94
1/4	1/4	1	4	136167	28.56	136321	36.83	165130	36.83
5/16	5/16	1-1/8	3	136178	30.60	136332	41.30	165141	41.30
3/8	3/8	1-1/8	3	136189	35.10	136343	47.38	165152	47.38
3/8	3/8	1	4	136200	40.98	136354	52.74	165163	52.74
7/16	7/16	2	4	136211	55.30	136365	71.90	165174	71.90
1/2	1/2	1	4	136222	59.87	136376	77.12	165185	77.12
1/2	1/2	2	4	136233	63.44	136387	81.40	165196	81.40
5/8	5/8	2-1/4	5	136244	141.75	136398	175.43	165207	175.43
3/4	3/4	2-1/4	5	136255	195.78	136409	252.62	165218	252.62
7/8	7/8	2-1/4	5	136266	371.10	136420	438.58	165229	438.58
1	1	2-1/4	5	136277	268.06	136431	345.95	165240	345.95

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE	TICN	LIST PRICE
1/8	1/8	1	3	137366	18.03	137520	24.34	165713	24.34
3/16	3/16	1-1/8	3	137377	19.62	137531	25.19	165724	25.19
1/4	1/4	1-1/2	4	137388	27.70	137542	35.69	165735	35.69
1/4	1/4	1-1/2	6	137399	37.47	137553	48.19	165746	48.19
5/16	5/16	1-5/8	4	137410	37.82	137564	48.80	165757	48.80
3/8	3/8	1-3/4	4	137421	42.94	137575	54.99	165768	54.99
3/8	3/8	1-1/2	6	137432	65.02	137586	83.79	165779	83.79
7/16	7/16	3	6	137443	87.57	137597	112.28	165790	112.28
1/2	1/2	1-1/2	6	137454	98.94	137608	122.80	165801	122.80
1/2	1/2	3	6	137465	103.85	137619	127.72	165812	127.72
5/8	5/8	3	6	137476	152.98	137630	188.06	165823	188.06
3/4	3/4	3	6	137487	227.36	137641	279.29	165834	279.29
7/8	7/8	3	6	137498	404.84	137652	506.05	165845	506.05
1	1	3	6	137509	385.95	137663	474.28	165856	474.28

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



Solid Carbide Endmills

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

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	22.48	132042	30.10	164283	30.10
1/32	1/8	1/8	1-1/2	131646	14.37	132053	18.67	164294	18.67
3/64	1/8	1/8	1-1/2	131657	14.37	132064	18.67	164305	18.67
1/16	1/8	1/4	1-1/2	131668	13.33	132075	17.99	164316	17.99
5/64	1/8	1/4	1-1/2	131679	13.33	132086	17.99	164327	17.99
3/32	1/8	3/8	1-1/2	131690	13.99	132097	18.89	164338	18.89
7/64	1/8	3/8	1-1/2	131701	13.99	132108	18.89	164349	18.89
1/8	1/8	1/2	1-1/2	131712	12.82	132119	17.31	164360	17.31
9/64	3/16	9/16	2	131723	18.80	132130	25.38	164371	25.38
5/32	3/16	9/16	2	131734	18.80	132141	25.38	164382	25.38
11/64	3/16	5/8	2	131745	18.80	132152	25.38	164393	25.38
3/16	3/16	5/8	2	131756	16.90	132163	22.81	164404	22.81
13/64	1/4	5/8	2-1/2	131767	21.91	132174	31.05	164415	31.05
7/32	1/4	5/8	2-1/2	131778	21.91	132185	31.05	164426	31.05
15/64	1/4	3/4	2-1/2	131789	21.91	132196	31.05	164437	31.05
1/4	1/4	3/4	2-1/2	131800	22.96	132207	29.59	164448	29.59
17/64	5/16	3/4	2-1/2	131811	31.05	132218	39.92	164459	39.92
9/32	5/16	3/4	2-1/2	131822	31.11	132229	39.99	164470	39.99
19/64	5/16	13/16	2-1/2	131833	33.80	132240	44.36	164481	44.36
5/16	5/16	13/16	2-1/2	131844	28.61	132251	36.79	164492	36.79
21/64	3/8	1	2-1/2	131855	39.31	132262	53.06	164503	53.06
11/32	3/8	1	2-1/2	131866	41.27	132273	53.06	164514	53.06
23/64	3/8	1	2-1/2	131877	39.31	132284	53.06	164525	53.06
3/8	3/8	1	2-1/2	131888	30.62	132295	43.28	164536	43.28
25/64	7/16	1	2-3/4	131899	53.24	132306	68.59	164547	68.59
13/32	7/16	1	2-3/4	131910	53.24	132317	68.59	164558	68.59
27/64	7/16	1	2-3/4	131921	53.24	132328	68.59	164569	68.59
7/16	7/16	1	2-3/4	131932	45.32	132339	58.42	164580	58.42
29/64	1/2	1	3	131943	70.18	132350	90.51	164591	90.51
15/32	1/2	1	3	131954	70.18	132361	90.51	164602	90.51
31/64	1/2	1	3	131965	70.18	132372	90.51	164613	90.51
1/2	1/2	1	3	131976	62.16	132383	80.10	164624	80.10
9/16	9/16	1-1/4	3-1/2	131987	94.73	132394	116.59	164635	116.59
5/8	5/8	1-1/4	3-1/2	131998	100.50	132405	129.53	164646	129.53
3/4	3/4	1-1/2	4	132009	148.06	132416	192.97	164657	192.97
7/8	7/8	1-1/2	4	132020	286.76	132427	364.36	164668	364.36
1	1	1-1/2	4	132031	264.49	132438	340.82	164679	340.82

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

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

Solid Carbide Endmills



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



UNCOATED



ALTiN COATED



TiCN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	3/4	2-1/4	136750	19.18	136904	24.67	165405	24.67
3/16	3/16	3/4	2-1/2	136761	22.06	136915	28.37	165416	28.37
1/4	1/4	1-1/8	3	136772	31.04	136926	39.95	165427	39.95
1/4	1/4	1	4	136783	34.27	136937	44.17	165438	44.17
5/16	5/16	1-1/8	3	136794	36.50	136948	49.27	165449	49.27
3/8	3/8	1-1/8	3	136805	42.15	136959	56.90	165460	56.90
3/8	3/8	1	4	136816	51.61	136970	67.09	165471	67.09
7/16	7/16	2	4	136827	70.60	136981	91.78	165482	91.78
1/2	1/2	1	4	136838	72.28	136992	91.93	165493	91.93
1/2	1/2	2	4	136849	72.98	137003	92.63	165504	92.63
5/8	5/8	2-1/4	5	136860	166.31	137014	211.22	165515	211.22
3/4	3/4	2-1/4	5	136871	231.57	137025	293.32	165526	293.32
7/8	7/8	2-1/4	5	136882	398.09	137036	489.19	165537	489.19
1	1	2-1/4	5	136893	458.22	137047	563.48	165548	563.48

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



UNCOATED



ALTiN COATED



TiCN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	TiCN	LIST PRICE
1/8	1/8	1	3	138026	21.47	138180	28.99	166021	28.99
3/16	3/16	1-1/8	3	138037	23.52	138191	30.25	166032	30.25
1/4	1/4	1-1/2	4	138048	31.73	138202	40.81	166043	40.81
1/4	1/4	1-1/2	6	138059	38.35	138213	49.32	166054	49.32
5/16	5/16	1-5/8	4	138070	45.61	138224	58.88	166065	58.88
3/8	3/8	1-3/4	4	138081	49.12	138235	62.77	166076	62.77
3/8	3/8	1-1/2	6	138092	69.19	138246	84.94	166087	84.94
7/16	7/16	3	6	138103	103.85	138257	133.33	166098	133.33
1/2	1/2	1-1/2	6	138114	110.17	138268	141.05	166109	141.05
1/2	1/2	3	6	138125	110.87	138279	141.75	166120	141.75
5/8	5/8	3	6	138136	174.73	138290	214.72	166131	214.72
3/4	3/4	3	6	138147	247.79	138301	334.51	166142	334.51
7/8	7/8	3	6	138158	438.58	138312	546.53	166153	546.53
1	1	3	6	138169	442.09	138323	569.14	166164	569.14

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



Solid Carbide Endmills

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	150973	14.45
1/8	1/8	1/2	1-1/2	.020	150984	14.45
1/8	1/8	1/2	1-1/2	.030	150995	14.45
3/16	3/16	5/8	2	.015	151006	14.45
3/16	3/16	5/8	2	.020	151017	14.45
3/16	3/16	5/8	2	.030	151028	14.45
1/4	1/4	3/4	2-1/2	.015	151039	21.07
1/4	1/4	3/4	2-1/2	.020	151050	21.07
1/4	1/4	3/4	2-1/2	.030	151061	21.07
1/4	1/4	3/4	2-1/2	.045	151072	21.07
1/4	1/4	3/4	2-1/2	.060	151083	21.07
5/16	5/16	13/16	2-1/2	.015	151094	32.30
5/16	5/16	13/16	2-1/2	.020	151105	32.30
5/16	5/16	13/16	2-1/2	.030	151116	32.30
5/16	5/16	13/16	2-1/2	.045	151127	32.30
5/16	5/16	13/16	2-1/2	.060	151138	32.30
3/8	3/8	1	2-1/2	.015	151149	43.28
3/8	3/8	1	2-1/2	.020	151160	43.28
3/8	3/8	1	2-1/2	.030	151171	43.28
3/8	3/8	1	2-1/2	.045	151182	43.28
3/8	3/8	1	2-1/2	.060	151193	43.28
1/2	1/2	1	3	.015	151204	74.43
1/2	1/2	1	3	.020	151215	74.43
1/2	1/2	1	3	.030	151226	74.43
1/2	1/2	1	3	.045	151237	74.43
1/2	1/2	1	3	.060	151248	74.43
1/2	1/2	1	3	.090	151259	74.43
1/2	1/2	1	3	.125	151270	74.43
5/8	5/8	1-1/4	3-1/2	.015	151281	105.30
5/8	5/8	1-1/4	3-1/2	.020	151292	105.30
5/8	5/8	1-1/4	3-1/2	.030	151303	105.30
5/8	5/8	1-1/4	3-1/2	.045	151314	105.30
5/8	5/8	1-1/4	3-1/2	.060	151325	105.30
5/8	5/8	1-1/4	3-1/2	.090	151336	105.30
3/4	3/4	1-1/2	4	.015	151347	155.79
3/4	3/4	1-1/2	4	.020	151358	155.79
3/4	3/4	1-1/2	4	.030	151369	155.79
3/4	3/4	1-1/2	4	.045	151380	155.79
3/4	3/4	1-1/2	4	.060	151391	155.79
3/4	3/4	1-1/2	4	.090	151402	155.79
3/4	3/4	1-1/2	4	.125	151413	155.79
1	1	1-1/2	4	.015	151424	294.79
1	1	1-1/2	4	.020	151435	294.79
1	1	1-1/2	4	.030	151446	294.79
1	1	1-1/2	4	.045	151457	294.79
1	1	1-1/2	4	.060	151468	294.79
1	1	1-1/2	4	.090	151479	294.79
1	1	1-1/2	4	.125	151490	294.79

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓜ RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	151501	22.48
1/8	1/8	1/2	1-1/2	.020	151512	22.48
1/8	1/8	1/2	1-1/2	.030	151523	22.48
3/16	3/16	5/8	2	.015	151534	22.48
3/16	3/16	5/8	2	.020	151545	22.48
3/16	3/16	5/8	2	.030	151556	22.48
1/4	1/4	3/4	2-1/2	.015	151567	30.88
1/4	1/4	3/4	2-1/2	.020	151578	30.88
1/4	1/4	3/4	2-1/2	.030	151589	30.88
1/4	1/4	3/4	2-1/2	.045	151600	30.88
1/4	1/4	3/4	2-1/2	.060	151611	30.88
5/16	5/16	13/16	2-1/2	.015	151622	44.39
5/16	5/16	13/16	2-1/2	.020	151633	44.39
5/16	5/16	13/16	2-1/2	.030	151644	44.39
5/16	5/16	13/16	2-1/2	.045	151655	44.39
5/16	5/16	13/16	2-1/2	.060	151666	44.39
3/8	3/8	1	2-1/2	.015	151677	48.11
3/8	3/8	1	2-1/2	.020	151688	48.11
3/8	3/8	1	2-1/2	.030	151699	48.11
3/8	3/8	1	2-1/2	.045	151710	48.11
3/8	3/8	1	2-1/2	.060	151721	48.11
1/2	1/2	1	3	.015	151732	80.58
1/2	1/2	1	3	.020	151743	80.58
1/2	1/2	1	3	.030	151754	80.58
1/2	1/2	1	3	.045	151765	80.58
1/2	1/2	1	3	.060	151776	80.58
1/2	1/2	1	3	.090	151787	80.58
1/2	1/2	1	3	.125	151798	80.58
5/8	5/8	1-1/4	3-1/2	.015	151809	115.96
5/8	5/8	1-1/4	3-1/2	.020	151820	115.96
5/8	5/8	1-1/4	3-1/2	.030	151831	115.96
5/8	5/8	1-1/4	3-1/2	.045	151842	115.96
5/8	5/8	1-1/4	3-1/2	.060	151853	115.96
5/8	5/8	1-1/4	3-1/2	.090	151864	115.96
3/4	3/4	1-1/2	4	.015	151875	162.81
3/4	3/4	1-1/2	4	.020	151886	162.81
3/4	3/4	1-1/2	4	.030	151897	162.81
3/4	3/4	1-1/2	4	.045	151908	162.81
3/4	3/4	1-1/2	4	.060	151919	162.81
3/4	3/4	1-1/2	4	.090	151930	162.81
3/4	3/4	1-1/2	4	.125	151941	162.81
1	1	1-1/2	4	.015	151952	339.83
1	1	1-1/2	4	.020	151963	339.83
1	1	1-1/2	4	.030	151974	339.83
1	1	1-1/2	4	.045	151985	339.83
1	1	1-1/2	4	.060	151996	339.83
1	1	1-1/2	4	.090	152007	339.83
1	1	1-1/2	4	.125	152018	339.83

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

CARBIDE ENDMILLS
 CARBIDE REAMERS
 CARBIDE DRILLS
 CARBIDE DRILL MILLS
 CARBIDE THREADMILLS
 CARBIDE MICRO ENDMILLS

Solid Carbide Endmills



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



UNCOATED



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	152029	14.45
1/8	1/8	1/2	1-1/2	.020	152040	14.45
1/8	1/8	1/2	1-1/2	.030	152051	14.45
3/16	3/16	5/8	2	.015	152062	14.45
3/16	3/16	5/8	2	.020	152073	14.45
3/16	3/16	5/8	2	.030	152084	14.45
1/4	1/4	3/4	2-1/2	.015	152095	21.07
1/4	1/4	3/4	2-1/2	.020	152106	21.07
1/4	1/4	3/4	2-1/2	.030	152117	21.07
1/4	1/4	3/4	2-1/2	.045	152128	21.07
1/4	1/4	3/4	2-1/2	.060	152139	21.07
5/16	5/16	13/16	2-1/2	.015	152150	32.30
5/16	5/16	13/16	2-1/2	.020	152161	32.30
5/16	5/16	13/16	2-1/2	.030	152172	32.30
5/16	5/16	13/16	2-1/2	.045	152183	32.30
5/16	5/16	13/16	2-1/2	.060	152194	32.30
3/8	3/8	1	2-1/2	.015	152205	43.28
3/8	3/8	1	2-1/2	.020	152216	43.28
3/8	3/8	1	2-1/2	.030	152227	43.28
3/8	3/8	1	2-1/2	.045	152238	43.28
3/8	3/8	1	2-1/2	.060	152249	43.28
1/2	1/2	1	3	.015	152260	74.43
1/2	1/2	1	3	.020	152271	74.43
1/2	1/2	1	3	.030	152282	74.43
1/2	1/2	1	3	.045	152293	74.43
1/2	1/2	1	3	.060	152304	74.43
1/2	1/2	1	3	.090	152315	74.43
1/2	1/2	1	3	.125	152326	74.43
5/8	5/8	1-1/4	3-1/2	.015	152337	105.30
5/8	5/8	1-1/4	3-1/2	.020	152348	105.30
5/8	5/8	1-1/4	3-1/2	.030	152359	105.30
5/8	5/8	1-1/4	3-1/2	.045	152370	105.30
5/8	5/8	1-1/4	3-1/2	.060	152381	105.30
5/8	5/8	1-1/4	3-1/2	.090	152392	105.30
3/4	3/4	1-1/2	4	.015	152403	155.79
3/4	3/4	1-1/2	4	.020	152414	155.79
3/4	3/4	1-1/2	4	.030	152425	155.79
3/4	3/4	1-1/2	4	.045	152436	155.79
3/4	3/4	1-1/2	4	.060	152447	155.79
3/4	3/4	1-1/2	4	.090	152458	155.79
3/4	3/4	1-1/2	4	.125	152469	155.79
1	1	1-1/2	4	.015	152480	294.79
1	1	1-1/2	4	.020	152491	294.79
1	1	1-1/2	4	.030	152502	294.79
1	1	1-1/2	4	.045	152513	294.79
1	1	1-1/2	4	.060	152524	294.79
1	1	1-1/2	4	.090	152535	294.79
1	1	1-1/2	4	.125	152546	294.79

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	® RADIUS	ITEM#	LIST PRICE
1/8	1/8	1/2	1-1/2	.015	152557	22.48
1/8	1/8	1/2	1-1/2	.020	152568	22.48
1/8	1/8	1/2	1-1/2	.030	152579	22.48
3/16	3/16	5/8	2	.015	152590	22.48
3/16	3/16	5/8	2	.020	152601	22.48
3/16	3/16	5/8	2	.030	152612	22.48
1/4	1/4	3/4	2-1/2	.015	152623	30.88
1/4	1/4	3/4	2-1/2	.020	152634	30.88
1/4	1/4	3/4	2-1/2	.030	152645	30.88
1/4	1/4	3/4	2-1/2	.045	152656	30.88
1/4	1/4	3/4	2-1/2	.060	152667	30.88
5/16	5/16	13/16	2-1/2	.015	152678	44.39
5/16	5/16	13/16	2-1/2	.020	152689	44.39
5/16	5/16	13/16	2-1/2	.030	152700	44.39
5/16	5/16	13/16	2-1/2	.045	152711	44.39
5/16	5/16	13/16	2-1/2	.060	152722	44.39
3/8	3/8	1	2-1/2	.015	152733	48.11
3/8	3/8	1	2-1/2	.020	152744	48.11
3/8	3/8	1	2-1/2	.030	152755	48.11
3/8	3/8	1	2-1/2	.045	152766	48.11
3/8	3/8	1	2-1/2	.060	152777	48.11
1/2	1/2	1	3	.015	152788	80.58
1/2	1/2	1	3	.020	152799	80.58
1/2	1/2	1	3	.030	152810	80.58
1/2	1/2	1	3	.045	152821	80.58
1/2	1/2	1	3	.060	152832	80.58
1/2	1/2	1	3	.090	152843	80.58
1/2	1/2	1	3	.125	152854	80.58
5/8	5/8	1-1/4	3-1/2	.015	152865	115.96
5/8	5/8	1-1/4	3-1/2	.020	152876	115.96
5/8	5/8	1-1/4	3-1/2	.030	152887	115.96
5/8	5/8	1-1/4	3-1/2	.045	152898	115.96
5/8	5/8	1-1/4	3-1/2	.060	152909	115.96
5/8	5/8	1-1/4	3-1/2	.090	152920	115.96
3/4	3/4	1-1/2	4	.015	152931	162.81
3/4	3/4	1-1/2	4	.020	152942	162.81
3/4	3/4	1-1/2	4	.030	152953	162.81
3/4	3/4	1-1/2	4	.045	152964	162.81
3/4	3/4	1-1/2	4	.060	152975	162.81
3/4	3/4	1-1/2	4	.090	152986	162.81
3/4	3/4	1-1/2	4	.125	152997	162.81
1	1	1-1/2	4	.015	153008	339.83
1	1	1-1/2	4	.020	153019	339.83
1	1	1-1/2	4	.030	153030	339.83
1	1	1-1/2	4	.045	153041	339.83
1	1	1-1/2	4	.060	153052	339.83
1	1	1-1/2	4	.090	153063	339.83
1	1	1-1/2	4	.125	153074	339.83

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



Solid Carbide Endmills

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



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153085	24.47
1/8	1/8	3/4	2-1/4	0.020	153096	24.47
1/8	1/8	3/4	2-1/4	0.030	153107	24.47
3/16	3/16	3/4	2-1/2	0.015	153118	28.74
3/16	3/16	3/4	2-1/2	0.020	153129	28.74
3/16	3/16	3/4	2-1/2	0.030	153140	28.74
1/4	1/4	1-1/8	3	0.015	153151	41.13
1/4	1/4	1-1/8	3	0.020	153162	41.13
1/4	1/4	1-1/8	3	0.030	153173	41.13
1/4	1/4	1-1/8	3	0.045	153184	41.13
1/4	1/4	1-1/8	3	0.060	153195	41.13
1/4	1/4	1	4	0.015	153206	43.32
1/4	1/4	1	4	0.020	153217	43.32
1/4	1/4	1	4	0.030	153228	43.32
1/4	1/4	1	4	0.045	153239	43.32
1/4	1/4	1	4	0.060	153250	43.32
5/16	5/16	1-1/8	3	0.015	153261	46.41
5/16	5/16	1-1/8	3	0.020	153272	46.41
5/16	5/16	1-1/8	3	0.030	153283	46.41
5/16	5/16	1-1/8	3	0.045	153294	46.41
5/16	5/16	1-1/8	3	0.060	153305	46.41
3/8	3/8	1-1/8	3	0.015	153316	53.25
3/8	3/8	1-1/8	3	0.020	153327	53.25
3/8	3/8	1-1/8	3	0.030	153338	53.25
3/8	3/8	1-1/8	3	0.045	153349	53.25
3/8	3/8	1-1/8	3	0.060	153360	53.25
3/8	3/8	1	4	0.015	153371	62.18
3/8	3/8	1	4	0.020	153382	62.18
3/8	3/8	1	4	0.030	153393	62.18
3/8	3/8	1	4	0.045	153404	62.18
3/8	3/8	1	4	0.060	153415	62.18
1/2	1/2	1	4	0.015	153426	90.82
1/2	1/2	1	4	0.020	153437	90.82

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	Ⓡ RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	153448	90.82
1/2	1/2	1	4	0.045	153459	90.82
1/2	1/2	1	4	0.060	153470	90.82
1/2	1/2	1	4	0.090	153481	90.82
1/2	1/2	1	4	0.125	153492	90.82
1/2	1/2	2	4	0.015	153503	96.24
1/2	1/2	2	4	0.020	153514	96.24
1/2	1/2	2	4	0.030	153525	96.24
1/2	1/2	2	4	0.045	153536	96.24
1/2	1/2	2	4	0.060	153547	96.24
1/2	1/2	2	4	0.090	153558	96.24
1/2	1/2	2	4	0.125	153569	96.24
5/8	5/8	2-1/4	5	0.015	153580	197.83
5/8	5/8	2-1/4	5	0.020	153591	197.83
5/8	5/8	2-1/4	5	0.030	153602	197.83
5/8	5/8	2-1/4	5	0.045	153613	197.83
5/8	5/8	2-1/4	5	0.060	153624	197.83
5/8	5/8	2-1/4	5	0.090	153635	197.83
3/4	3/4	2-1/4	5	0.015	153646	273.23
3/4	3/4	2-1/4	5	0.020	153657	273.23
3/4	3/4	2-1/4	5	0.030	153668	273.23
3/4	3/4	2-1/4	5	0.045	153679	273.23
3/4	3/4	2-1/4	5	0.060	153690	273.23
3/4	3/4	2-1/4	5	0.090	153701	273.23
3/4	3/4	2-1/4	5	0.125	153712	273.23
1	1	2-1/4	5	0.015	153723	374.11
1	1	2-1/4	5	0.020	153734	374.11
1	1	2-1/4	5	0.030	153745	374.11
1	1	2-1/4	5	0.045	153756	374.11
1	1	2-1/4	5	0.060	153767	374.11
1	1	2-1/4	5	0.090	153778	374.11
1	1	2-1/4	5	0.125	153789	374.11
-	-	-	-	-	-	-

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

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

Solid Carbide Endmills



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



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	3/4	2-1/4	0.015	153800	30.59
1/8	1/8	3/4	2-1/4	0.020	153811	30.59
1/8	1/8	3/4	2-1/4	0.030	153822	30.59
3/16	3/16	3/4	2-1/2	0.015	153833	35.91
3/16	3/16	3/4	2-1/2	0.020	153844	35.91
3/16	3/16	3/4	2-1/2	0.030	153855	35.91
1/4	1/4	1-1/8	3	0.015	153866	51.41
1/4	1/4	1-1/8	3	0.020	153877	51.41
1/4	1/4	1-1/8	3	0.030	153888	51.41
1/4	1/4	1-1/8	3	0.045	153899	51.41
1/4	1/4	1-1/8	3	0.060	153910	51.41
1/4	1/4	1	4	0.015	153921	54.16
1/4	1/4	1	4	0.020	153932	54.16
1/4	1/4	1	4	0.030	153943	54.16
1/4	1/4	1	4	0.045	153954	54.16
1/4	1/4	1	4	0.060	153965	54.16
5/16	5/16	1-1/8	3	0.015	153976	58.01
5/16	5/16	1-1/8	3	0.020	153987	58.01
5/16	5/16	1-1/8	3	0.030	153998	58.01
5/16	5/16	1-1/8	3	0.045	154009	58.01
5/16	5/16	1-1/8	3	0.060	154020	58.01
3/8	3/8	1-1/8	3	0.015	154031	66.56
3/8	3/8	1-1/8	3	0.020	154042	66.56
3/8	3/8	1-1/8	3	0.030	154053	66.56
3/8	3/8	1-1/8	3	0.045	154064	66.56
3/8	3/8	1-1/8	3	0.060	154075	66.56
3/8	3/8	1	4	0.015	154086	77.72
3/8	3/8	1	4	0.020	154097	77.72
3/8	3/8	1	4	0.030	154108	77.72
3/8	3/8	1	4	0.045	154119	77.72
3/8	3/8	1	4	0.060	154130	77.72
1/2	1/2	1	4	0.015	154141	113.53
1/2	1/2	1	4	0.020	154152	113.53

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	1	4	0.030	154163	113.53
1/2	1/2	1	4	0.045	154174	113.53
1/2	1/2	1	4	0.060	154185	113.53
1/2	1/2	1	4	0.090	154196	113.53
1/2	1/2	1	4	0.125	154207	113.53
1/2	1/2	2	4	0.015	154218	120.29
1/2	1/2	2	4	0.020	154229	120.29
1/2	1/2	2	4	0.030	154240	120.29
1/2	1/2	2	4	0.045	154251	120.29
1/2	1/2	2	4	0.060	154262	120.29
1/2	1/2	2	4	0.090	154273	120.29
1/2	1/2	2	4	0.125	154284	120.29
5/8	5/8	2-1/4	5	0.015	154295	247.28
5/8	5/8	2-1/4	5	0.020	154306	247.28
5/8	5/8	2-1/4	5	0.030	154317	247.28
5/8	5/8	2-1/4	5	0.045	154328	247.28
5/8	5/8	2-1/4	5	0.060	154339	247.28
5/8	5/8	2-1/4	5	0.090	154350	247.28
3/4	3/4	2-1/4	5	0.015	154361	341.55
3/4	3/4	2-1/4	5	0.020	154372	341.55
3/4	3/4	2-1/4	5	0.030	154383	341.55
3/4	3/4	2-1/4	5	0.045	154394	341.55
3/4	3/4	2-1/4	5	0.060	154405	341.55
3/4	3/4	2-1/4	5	0.090	154416	341.55
3/4	3/4	2-1/4	5	0.125	154427	341.55
1	1	2-1/4	5	0.015	154438	467.64
1	1	2-1/4	5	0.020	154449	467.64
1	1	2-1/4	5	0.030	154460	467.64
1	1	2-1/4	5	0.045	154471	467.64
1	1	2-1/4	5	0.060	154482	467.64
1	1	2-1/4	5	0.090	154493	467.64
1	1	2-1/4	5	0.125	154504	467.64
-	-	-	-	-	-	-

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



Solid Carbide Endmills

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



UNCOATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	154515	27.35
1/8	1/8	1	3	0.020	154526	27.35
1/8	1/8	1	3	0.030	154537	27.35
3/16	3/16	1-1/8	3	0.015	154548	29.77
3/16	3/16	1-1/8	3	0.020	154559	29.77
3/16	3/16	1-1/8	3	0.030	154570	29.77
1/4	1/4	1-1/2	4	0.015	154581	42.02
1/4	1/4	1-1/2	4	0.020	154592	42.02
1/4	1/4	1-1/2	4	0.030	154603	42.02
1/4	1/4	1-1/2	4	0.045	154614	42.02
1/4	1/4	1-1/2	4	0.060	154625	42.02
1/4	1/4	1-1/2	6	0.015	154636	56.86
1/4	1/4	1-1/2	6	0.020	154647	56.86
1/4	1/4	1-1/2	6	0.030	154658	56.86
1/4	1/4	1-1/2	6	0.045	154669	56.86
1/4	1/4	1-1/2	6	0.060	154680	56.86
5/16	5/16	1-5/8	4	0.015	154691	57.38
5/16	5/16	1-5/8	4	0.020	154702	57.38
5/16	5/16	1-5/8	4	0.030	154713	57.38
5/16	5/16	1-5/8	4	0.045	154724	57.38
5/16	5/16	1-5/8	4	0.060	154735	57.38
3/8	3/8	1-3/4	4	0.015	154746	65.15
3/8	3/8	1-3/4	4	0.020	154757	65.15
3/8	3/8	1-3/4	4	0.030	154768	65.15
3/8	3/8	1-3/4	4	0.045	154779	65.15
3/8	3/8	1-3/4	4	0.060	154790	65.15
3/8	3/8	1-1/2	6	0.015	154801	98.64
3/8	3/8	1-1/2	6	0.020	154812	98.64
3/8	3/8	1-1/2	6	0.030	154823	98.64
3/8	3/8	1-1/2	6	0.045	154834	98.64
3/8	3/8	1-1/2	6	0.060	154845	98.64
1/2	1/2	1-1/2	6	0.015	154856	150.10
1/2	1/2	1-1/2	6	0.020	154867	150.10
1/2	1/2	1-1/2	6	0.030	154878	150.10
1/2	1/2	1-1/2	6	0.045	154889	150.10
1/2	1/2	1-1/2	6	0.060	154900	150.10
1/2	1/2	1-1/2	6	0.090	154911	150.10
1/2	1/2	1-1/2	6	0.125	154922	150.10
1/2	1/2	3	6	0.015	154933	157.55
1/2	1/2	3	6	0.020	154944	157.55

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	154955	157.55
1/2	1/2	3	6	0.045	154966	157.55
1/2	1/2	3	6	0.060	154977	157.55
1/2	1/2	3	6	0.090	154988	157.55
1/2	1/2	3	6	0.125	154999	157.55
5/8	5/8	3	6	0.015	155010	213.50
5/8	5/8	3	6	0.020	155021	213.50
5/8	5/8	3	6	0.030	155032	213.50
5/8	5/8	3	6	0.045	155043	213.50
5/8	5/8	3	6	0.060	155054	213.50
5/8	5/8	3	6	0.090	155065	213.50
3/4	3/4	3	6	0.015	155076	317.30
3/4	3/4	3	6	0.020	155087	317.30
3/4	3/4	3	6	0.030	155098	317.30
3/4	3/4	3	6	0.045	155109	317.30
3/4	3/4	3	6	0.060	155120	317.30
3/4	3/4	3	6	0.090	155131	317.30
3/4	3/4	3	6	0.125	155142	317.30
3/4	3/4	4	7	0.015	155153	544.52
3/4	3/4	4	7	0.020	155164	544.52
3/4	3/4	4	7	0.030	155175	544.52
3/4	3/4	4	7	0.045	155186	544.52
3/4	3/4	4	7	0.060	155197	544.52
3/4	3/4	4	7	0.090	155208	544.52
3/4	3/4	4	7	0.125	155219	544.52
1	1	3	6	0.015	155230	538.64
1	1	3	6	0.020	155241	538.64
1	1	3	6	0.030	155252	538.64
1	1	3	6	0.045	155263	538.64
1	1	3	6	0.060	155274	538.64
1	1	3	6	0.090	155285	538.64
1	1	3	6	0.125	155296	538.64
1	1	4	7	0.015	155307	706.11
1	1	4	7	0.020	155318	706.11
1	1	4	7	0.030	155329	706.11
1	1	4	7	0.045	155340	706.11
1	1	4	7	0.060	155351	706.11
1	1	4	7	0.090	155362	706.11
1	1	4	7	0.125	155373	706.11
-	-	-	-	-	-	-

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

CARBIDE ENDMILLS
 CARBIDE REAMERS
 CARBIDE DRILLS
 CARBIDE DRILL MILLS
 CARBIDE THREADMILLS
 CARBIDE MICRO ENDMILLS

Solid Carbide Endmills



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



ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/8	1/8	1	3	0.015	155384	34.19
1/8	1/8	1	3	0.020	155395	34.19
1/8	1/8	1	3	0.030	155406	34.19
3/16	3/16	1-1/8	3	0.015	155417	37.22
3/16	3/16	1-1/8	3	0.020	155428	37.22
3/16	3/16	1-1/8	3	0.030	155439	37.22
1/4	1/4	1-1/2	4	0.015	155450	52.52
1/4	1/4	1-1/2	4	0.020	155461	52.52
1/4	1/4	1-1/2	4	0.030	155472	52.52
1/4	1/4	1-1/2	4	0.045	155483	52.52
1/4	1/4	1-1/2	4	0.060	155494	52.52
1/4	1/4	1-1/2	6	0.015	155505	71.06
1/4	1/4	1-1/2	6	0.020	155516	71.06
1/4	1/4	1-1/2	6	0.030	155527	71.06
1/4	1/4	1-1/2	6	0.045	155538	71.06
1/4	1/4	1-1/2	6	0.060	155549	71.06
5/16	5/16	1-5/8	4	0.015	155560	71.73
5/16	5/16	1-5/8	4	0.020	155571	71.73
5/16	5/16	1-5/8	4	0.030	155582	71.73
5/16	5/16	1-5/8	4	0.045	155593	71.73
5/16	5/16	1-5/8	4	0.060	155604	71.73
3/8	3/8	1-3/4	4	0.015	155615	81.44
3/8	3/8	1-3/4	4	0.020	155626	81.44
3/8	3/8	1-3/4	4	0.030	155637	81.44
3/8	3/8	1-3/4	4	0.045	155648	81.44
3/8	3/8	1-3/4	4	0.060	155659	81.44
3/8	3/8	1-1/2	6	0.015	155670	123.30
3/8	3/8	1-1/2	6	0.020	155681	123.30
3/8	3/8	1-1/2	6	0.030	155692	123.30
3/8	3/8	1-1/2	6	0.045	155703	123.30
3/8	3/8	1-1/2	6	0.060	155714	123.30
1/2	1/2	1-1/2	6	0.015	155725	187.63
1/2	1/2	1-1/2	6	0.020	155736	187.63
1/2	1/2	1-1/2	6	0.030	155747	187.63
1/2	1/2	1-1/2	6	0.045	155758	187.63
1/2	1/2	1-1/2	6	0.060	155769	187.63
1/2	1/2	1-1/2	6	0.090	155780	187.63
1/2	1/2	1-1/2	6	0.125	155791	187.63
1/2	1/2	3	6	0.015	155802	196.94
1/2	1/2	3	6	0.020	155813	196.94

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	ITEM#	LIST PRICE
1/2	1/2	3	6	0.030	155824	196.94
1/2	1/2	3	6	0.045	155835	196.94
1/2	1/2	3	6	0.060	155846	196.94
1/2	1/2	3	6	0.090	155857	196.94
1/2	1/2	3	6	0.125	155868	196.94
5/8	5/8	3	6	0.015	155879	266.87
5/8	5/8	3	6	0.020	155890	266.87
5/8	5/8	3	6	0.030	155901	266.87
5/8	5/8	3	6	0.045	155912	266.87
5/8	5/8	3	6	0.060	155923	266.87
5/8	5/8	3	6	0.090	155934	266.87
3/4	3/4	3	6	0.015	155945	396.63
3/4	3/4	3	6	0.020	155956	396.63
3/4	3/4	3	6	0.030	155967	396.63
3/4	3/4	3	6	0.045	155978	396.63
3/4	3/4	3	6	0.060	155989	396.63
3/4	3/4	3	6	0.090	156000	396.63
3/4	3/4	3	6	0.125	156011	396.63
3/4	3/4	4	7	0.015	156022	680.64
3/4	3/4	4	7	0.020	156033	680.64
3/4	3/4	4	7	0.030	156044	680.64
3/4	3/4	4	7	0.045	156055	680.64
3/4	3/4	4	7	0.060	156066	680.64
3/4	3/4	4	7	0.090	156077	680.64
3/4	3/4	4	7	0.125	156088	680.64
1	1	3	6	0.015	156099	673.31
1	1	3	6	0.020	156110	673.31
1	1	3	6	0.030	156121	673.31
1	1	3	6	0.045	156132	673.31
1	1	3	6	0.060	156143	673.31
1	1	3	6	0.090	156154	673.31
1	1	3	6	0.125	156165	673.31
1	1	4	7	0.015	156176	882.64
1	1	4	7	0.020	156187	882.64
1	1	4	7	0.030	156198	882.64
1	1	4	7	0.045	156209	882.64
1	1	4	7	0.060	156220	882.64
1	1	4	7	0.090	156231	882.64
1	1	4	7	0.125	156242	882.64
-	-	-	-	-	-	-

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



Solid Carbide Endmills

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



**UNCOATED
METRIC**



**ALTiN COATED
METRIC**

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
3.5	4	12	50	133802	18.95
4.0	4	14	50	133813	18.95
4.5	6	16	50	133824	23.16
5.0	6	16	50	133835	23.16
6.0	6	19	50	133846	24.21
7.0	8	19	63	133857	26.32
8.0	8	20	63	133868	27.37
9.0	10	22	75	133879	40.00
10.0	10	22	75	133890	50.52
11.0	12	25	75	133901	55.79
12.0	12	25	75	133912	57.89
14.0	14	32	89	133923	97.89
16.0	16	32	89	133934	111.57
18.0	18	38	100	133945	152.62
20.0	20	38	100	133956	242.09
25.0	25	38	100	133967	315.77

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
3.5	4	12	50	134022	23.69
4.0	4	14	50	134033	23.69
4.5	6	16	50	134044	28.95
5.0	6	16	50	134055	28.95
6.0	6	19	50	134066	30.26
7.0	8	19	63	134077	32.89
8.0	8	20	63	134088	34.21
9.0	10	22	75	134099	50.00
10.0	10	22	75	134110	63.15
11.0	12	25	75	134121	69.74
12.0	12	25	75	134132	72.36
14.0	14	32	89	134143	122.36
16.0	16	32	89	134154	139.46
18.0	18	38	100	134165	190.77
20.0	20	38	100	134176	302.62
25.0	25	38	100	134187	394.71

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

SEE PAGE 48 FOR METRIC SIZES UNDER 3.5mm

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

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

Solid Carbide Endmills



STUB LENGTH - 2 FLUTE - 30° HELIX



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/64	1/8	0.023	1-1/2	216577	17.68	216687	22.09	216599	22.08	216709	27.60
1/32	1/8	1/16	1-1/2	130381	10.89	132449	14.13	130546	14.17	132614	18.13
3/64	1/8	3/32	1-1/2	130392	10.89	132460	14.13	130557	14.17	132625	18.13
1/16	1/8	1/8	1-1/2	130403	8.15	132471	10.64	130568	10.66	132636	13.63
5/64	1/8	1/8	1-1/2	216588	13.78	216698	17.23	216610	17.26	216720	21.57
3/32	1/8	3/16	1-1/2	130414	8.15	132482	10.64	130579	10.66	132647	13.63
1/8	1/8	1/4	1-1/2	130425	7.79	132493	10.16	130590	10.12	132658	12.96
5/32	3/16	5/16	2	130436	12.95	132504	16.01	130601	16.85	132669	21.58
3/16	3/16	3/8	2	130447	12.17	132515	15.08	130612	15.79	132680	20.21
7/32	1/4	7/16	2	130458	16.35	132526	20.30	130623	21.23	132691	27.17
1/4	1/4	1/2	2	130469	14.36	132537	17.83	130634	18.59	132702	23.80
5/16	5/16	1/2	2	130480	19.39	132548	25.21	130645	25.16	132713	32.21
3/8	3/8	5/8	2	130491	25.01	132559	30.98	130656	32.50	132724	39.62
7/16	7/16	5/8	2-1/2	130502	31.23	132570	38.74	130667	40.64	132735	49.55
1/2	1/2	5/8	2-1/2	130513	39.43	132581	48.96	130678	51.20	132746	65.53
5/8	5/8	3/4	3	130524	83.47	132592	98.61	130689	97.78	132757	119.71
3/4	3/4	1	3	130535	116.82	132603	144.56	130700	148.67	132768	190.31

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	17.68	216665	22.09	216643	22.08	216731	27.60
1/32	1/8	1/16	1-1/2	131140	10.89	131470	14.13	131305	14.17	133593	18.13
3/64	1/8	3/32	1-1/2	131151	10.89	131481	14.13	131316	14.17	133604	18.13
1/16	1/8	1/8	1-1/2	131162	8.15	131492	10.64	131327	10.66	133615	13.63
5/64	1/8	1/8	1-1/2	216632	13.78	216676	17.23	216654	17.26	216742	21.57
3/32	1/8	3/16	1-1/2	131173	8.15	131503	10.64	131338	10.66	133626	13.63
1/8	1/8	1/4	1-1/2	131184	7.79	131514	10.16	131349	10.12	133637	12.96
5/32	3/16	5/16	2	131195	12.95	131525	16.01	131360	16.85	133648	21.58
3/16	3/16	3/8	2	131206	12.17	131536	15.08	131371	15.79	133659	20.21
7/32	1/4	7/16	2	131217	16.35	131547	20.30	131382	21.23	133670	27.17
1/4	1/4	1/2	2	131228	14.36	131558	17.83	131393	18.59	133681	23.80
5/16	5/16	1/2	2	131239	19.39	131569	25.21	131404	25.16	133692	32.21
3/8	3/8	5/8	2	131250	25.01	131580	30.98	131415	32.50	133703	39.62
7/16	7/16	5/8	2-1/2	131261	31.23	131591	38.74	131426	40.64	133714	49.55
1/2	1/2	5/8	2-1/2	131272	39.43	131602	49.10	131437	51.20	133725	65.53
5/8	5/8	3/4	3	131283	83.47	131613	98.62	131448	97.78	133736	119.71
3/4	3/4	1	3	131294	116.82	131624	144.56	131459	148.67	133747	190.31

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



Solid Carbide Endmills

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



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/16	1/8	1/8	1-1/2	135166	15.12	135892	20.41	135287	18.91	135408	25.52
3/32	1/8	3/16	1-1/2	135177	15.57	135903	21.02	135298	19.45	135419	26.26
1/8	1/8	1/4	1-1/2	135188	12.56	135914	16.94	135309	15.70	135430	21.19
5/32	3/16	5/16	2	135199	16.90	135925	22.82	135320	21.13	135441	28.51
3/16	3/16	3/8	2	135210	16.90	135936	22.82	135331	21.13	135452	28.51
7/32	1/4	1/2	2-1/2	135221	23.18	135947	31.30	135342	28.97	135463	39.11
1/4	1/4	1/2	2-1/2	135232	23.18	135958	31.30	135353	28.97	135474	39.11
5/16	5/16	1/2	2-1/2	135243	31.33	135969	38.45	135364	39.16	135485	48.06
3/8	3/8	9/16	2-1/2	135254	34.57	135980	42.43	135375	43.22	135496	53.03
7/16	7/16	9/16	2-3/4	135265	48.86	135991	59.96	135386	61.07	135507	74.96
1/2	1/2	5/8	3	135276	59.80	136002	80.73	135397	74.75	135518	100.91

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



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/16	1/8	1/8	1-1/2	135529	15.12	136013	20.41	135650	18.91	135771	25.52
3/32	1/8	3/16	1-1/2	135540	15.57	136024	21.02	135661	19.45	135782	26.26
1/8	1/8	1/4	1-1/2	135551	12.56	136035	16.94	135672	15.70	135793	21.19
5/32	3/16	5/16	2	135562	16.90	136046	22.82	135683	21.13	135804	28.51
3/16	3/16	3/8	2	135573	16.90	136057	22.82	135694	21.13	135815	28.51
7/32	1/4	1/2	2-1/2	135584	23.18	136068	31.30	135705	28.97	135826	39.11
1/4	1/4	1/2	2-1/2	135595	23.18	136079	31.30	135716	28.97	135837	39.11
5/16	5/16	1/2	2-1/2	135606	31.33	136090	38.45	135727	39.16	135848	48.06
3/8	3/8	9/16	2-1/2	135617	34.57	136101	42.43	135738	43.22	135859	53.03
7/16	7/16	9/16	2-3/4	135628	48.86	136112	59.96	135749	61.07	135870	74.96
1/2	1/2	5/8	3	135639	59.80	136123	80.73	135760	74.75	135881	100.91

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

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

Solid Carbide Endmills



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



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/8	3/8	3/8	3-1/8	134198	52.12	134319	70.36	134682	58.63	134803	79.15
5/32	3/8	7/16	3-1/4	134209	50.47	134330	68.12	134693	58.63	134814	79.15
3/16	3/8	1/2	3-1/4	134220	50.47	134341	68.12	134704	58.63	134825	79.15
7/32	3/8	9/16	3-1/2	134231	53.32	134352	71.99	134715	58.63	134836	79.15
1/4	3/8	5/8	3-1/2	134242	51.91	134363	70.07	134726	58.63	134847	79.15
9/32	3/8	11/16	3-1/2	134253	57.22	134374	77.26	134737	67.31	134858	90.87
5/16	3/8	3/4	3-1/2	134264	57.22	134385	77.26	134748	67.31	134869	90.87
11/32	3/8	3/4	3-1/2	134275	57.22	134396	77.26	134759	67.31	134880	90.87
3/8	3/8	3/4	3-1/2	134286	57.22	134407	77.26	134770	67.31	134891	90.87
7/16	1/2	7/8	4	134297	85.15	134418	114.95	134781	91.61	134902	123.68
1/2	1/2	1	4	134308	95.65	134429	129.12	134792	99.59	134913	134.44

NOTE: ALL TOOLS WITH WELDON FLATS

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



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
1/8	3/8	3/8	3-1/8	134440	49.28	134561	66.53	134924	58.63	135045	79.15
5/32	3/8	7/16	3-1/4	134451	47.71	134572	64.42	134935	58.63	135056	79.15
3/16	3/8	1/2	3-1/4	134462	47.71	134583	64.42	134946	58.63	135067	79.15
7/32	3/8	9/16	3-1/2	134473	50.42	134594	68.06	134957	58.63	135078	79.15
1/4	3/8	5/8	3-1/2	134484	49.08	134605	66.25	134968	58.63	135089	79.15
9/32	3/8	11/16	3-1/2	134495	54.10	134616	73.04	134979	67.31	135100	90.87
5/16	3/8	3/4	3-1/2	134506	54.10	134627	73.04	134990	67.31	135111	90.87
11/32	3/8	3/4	3-1/2	134517	54.10	134638	73.04	135001	67.31	135122	90.87
3/8	3/8	3/4	3-1/2	134528	54.10	134649	73.04	135012	67.31	135133	90.87
7/16	1/2	7/8	4	134539	80.50	134660	108.68	135023	91.61	135144	123.68
1/2	1/2	1	4	134550	90.43	134671	122.08	135034	99.59	135155	134.44

NOTE: ALL TOOLS WITH WELDON FLATS

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

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Micro Endmills

2 FLUTE - 30° HELIX



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTIN COATED



BALL NOSE ALTIN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIN	LIST PRICE
0.005	0.125	0.015	1-1/2	143768	42.47	222682	50.96	144956	53.09	223870	63.71
0.006	0.125	0.018	1-1/2	143779	42.47	222693	50.96	144967	53.09	223881	63.71
0.007	0.125	0.021	1-1/2	143790	42.47	222704	50.96	144978	53.09	223892	63.71
0.008	0.125	0.024	1-1/2	143801	42.47	222715	50.96	144989	53.09	223903	63.71
0.009	0.125	0.027	1-1/2	143812	38.07	222726	45.68	145000	47.60	223914	57.11
0.010	0.125	0.030	1-1/2	143823	38.07	222737	45.68	145011	47.60	223925	57.11
0.011	0.125	0.033	1-1/2	143834	34.07	222748	40.88	145022	42.60	223936	51.14
0.012	0.125	0.036	1-1/2	143845	34.07	222759	40.88	145033	42.60	223947	51.14
0.013	0.125	0.039	1-1/2	143856	28.19	222770	33.83	145044	35.28	223958	42.33
0.014	0.125	0.042	1-1/2	143867	28.19	222781	33.83	145055	35.28	223969	42.33
0.015	0.125	0.045	1-1/2	143878	23.83	222792	28.58	145066	29.78	223980	35.73
0.016	0.125	0.048	1-1/2	143889	23.83	222803	28.58	145077	29.78	223991	35.73
0.017	0.125	0.051	1-1/2	143900	23.83	222814	28.58	145088	29.78	224002	35.73
0.018	0.125	0.054	1-1/2	143911	23.83	222825	28.58	145099	29.78	224013	35.73
0.019	0.125	0.057	1-1/2	143922	23.83	222836	28.58	145110	29.78	224024	35.73
0.020	0.125	0.060	1-1/2	143933	21.65	222847	25.98	145121	27.08	224035	32.48
0.021	0.125	0.063	1-1/2	143944	21.65	222858	25.98	145132	27.08	224046	32.48
0.022	0.125	0.066	1-1/2	143955	21.65	222869	25.98	145143	27.08	224057	32.48
0.023	0.125	0.069	1-1/2	143966	21.65	222880	25.98	145154	27.08	224068	32.48
0.024	0.125	0.072	1-1/2	143977	21.65	222891	25.98	145165	27.08	224079	32.48
0.025	0.125	0.075	1-1/2	143988	21.65	222902	25.98	145176	27.08	224090	32.48
0.026	0.125	0.078	1-1/2	143999	20.33	222913	24.39	145187	25.40	224101	30.47
0.027	0.125	0.081	1-1/2	144010	20.33	222924	24.39	145198	25.40	224112	30.47
0.028	0.125	0.084	1-1/2	144021	20.33	222935	24.39	145209	25.40	224123	30.47
0.029	0.125	0.087	1-1/2	144032	20.33	222946	24.39	145220	25.40	224134	30.47
0.030	0.125	0.090	1-1/2	144043	20.33	222957	24.39	145231	25.40	224145	30.47
0.031	0.125	0.093	1-1/2	144054	19.04	222968	22.85	145242	23.83	224156	28.58
0.032	0.125	0.096	1-1/2	144065	19.04	222979	22.85	145253	23.83	224167	28.58
0.033	0.125	0.099	1-1/2	144076	19.04	222990	22.85	145264	23.83	224178	28.58
0.034	0.125	0.102	1-1/2	144087	19.04	223001	22.85	145275	23.83	224189	28.58
0.035	0.125	0.105	1-1/2	144098	19.04	223012	22.85	145286	23.83	224200	28.58
0.036	0.125	0.108	1-1/2	144109	19.04	223023	22.85	145297	23.83	224211	28.58
0.037	0.125	0.111	1-1/2	144120	19.04	223034	22.85	145308	23.83	224222	28.58
0.038	0.125	0.114	1-1/2	144131	19.04	223045	22.85	145319	23.83	224233	28.58
0.039	0.125	0.117	1-1/2	144142	19.04	223056	22.85	145330	23.83	224244	28.58
0.040	0.125	0.120	1-1/2	144153	19.04	223067	22.85	145341	23.83	224255	28.58
0.041	0.125	0.123	1-1/2	144164	19.04	223078	22.85	145352	23.83	224266	28.58
0.042	0.125	0.126	1-1/2	144175	19.04	223089	22.85	145363	23.83	224277	28.58
0.043	0.125	0.129	1-1/2	144186	19.04	223100	22.85	145374	23.83	224288	28.58
0.044	0.125	0.132	1-1/2	144197	18.58	223111	22.30	145385	23.24	224299	27.89
0.045	0.125	0.135	1-1/2	144208	18.58	223122	22.30	145396	23.24	224310	27.89
0.046	0.125	0.138	1-1/2	144219	18.58	223133	22.30	145407	23.24	224321	27.89
0.047	0.125	0.141	1-1/2	144230	18.58	223144	22.30	145418	23.24	224332	27.89
0.048	0.125	0.144	1-1/2	144241	18.58	223155	22.30	145429	23.24	224343	27.89
0.049	0.125	0.147	1-1/2	144252	18.58	223166	22.30	145440	23.24	224354	27.89
0.050	0.125	0.150	1-1/2	144263	18.58	223177	22.30	145451	23.24	224365	27.89
0.051	0.125	0.153	1-1/2	144274	18.58	223188	22.30	145462	23.24	224376	27.89
0.052	0.125	0.156	1-1/2	144285	18.58	223199	22.30	145473	23.24	224387	27.89
0.053	0.125	0.159	1-1/2	144296	18.58	223210	22.30	145484	23.24	224398	27.89
0.054	0.125	0.162	1-1/2	144307	18.58	223221	22.30	145495	23.24	224409	27.89
0.055	0.125	0.165	1-1/2	144318	18.58	223232	22.30	145506	23.24	224420	27.89
0.056	0.125	0.168	1-1/2	144329	18.58	223243	22.30	145517	23.24	224431	27.89
0.057	0.125	0.171	1-1/2	144340	18.58	223254	22.30	145528	23.24	224442	27.89
0.058	0.125	0.174	1-1/2	144351	18.58	223265	22.30	145539	23.24	224453	27.89

LENGTH OF CUT = 3 X DIAMETER

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

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

Solid Carbide Micro Endmills



2 FLUTE - 30° HELIX



SQUARE END UNCOATED



BALL NOSE UNCOATED



SQUARE END ALTiN COATED



BALL NOSE ALTiN COATED

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTiN	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTiN	LIST PRICE
0.059	0.125	0.177	1-1/2	144362	18.58	223276	22.30	145550	23.24	224464	27.89
0.060	0.125	0.180	1-1/2	144373	18.58	223287	22.30	145561	23.24	224475	27.89
0.061	0.125	0.183	1-1/2	144384	18.58	223298	22.30	145572	23.24	224486	27.89
0.062	0.125	0.186	1-1/2	144395	18.58	223309	22.30	145583	23.24	224497	27.89
0.063	0.125	0.189	1-1/2	144406	18.58	223320	22.30	145594	23.24	224508	27.89
0.064	0.125	0.192	1-1/2	144417	18.58	223331	22.30	145605	23.24	224519	27.89
0.065	0.125	0.195	1-1/2	144428	18.58	223342	22.30	145616	23.24	224530	27.89
0.066	0.125	0.198	1-1/2	144439	18.58	223353	22.30	145627	23.24	224541	27.89
0.067	0.125	0.201	1-1/2	144450	18.58	223364	22.30	145638	23.24	224552	27.89
0.068	0.125	0.204	1-1/2	144461	18.58	223375	22.30	145649	23.24	224563	27.89
0.069	0.125	0.207	1-1/2	144472	18.58	223386	22.30	145660	23.24	224574	27.89
0.070	0.125	0.210	1-1/2	144483	18.58	223397	22.30	145671	23.24	224585	27.89
0.071	0.125	0.213	1-1/2	144494	18.58	223408	22.30	145682	23.24	224596	27.89
0.072	0.125	0.216	1-1/2	144505	18.58	223419	22.30	145693	23.24	224607	27.89
0.073	0.125	0.219	1-1/2	144516	18.58	223430	22.30	145704	23.24	224618	27.89
0.074	0.125	0.222	1-1/2	144527	18.58	223441	22.30	145715	23.24	224629	27.89
0.075	0.125	0.225	1-1/2	144538	18.58	223452	22.30	145726	23.24	224640	27.89
0.076	0.125	0.228	1-1/2	144549	18.58	223463	22.30	145737	23.24	224651	27.89
0.077	0.125	0.231	1-1/2	144560	18.58	223474	22.30	145748	23.24	224662	27.89
0.078	0.125	0.234	1-1/2	144571	18.58	223485	22.30	145759	23.24	224673	27.89
0.079	0.125	0.237	1-1/2	144582	18.58	223496	22.30	145770	23.24	224684	27.89
0.080	0.125	0.240	1-1/2	144593	18.58	223507	22.30	145781	23.24	224695	27.89
0.081	0.125	0.243	1-1/2	144604	18.58	223518	22.30	145792	23.24	224706	27.89
0.082	0.125	0.246	1-1/2	144615	18.58	223529	22.30	145803	23.24	224717	27.89
0.083	0.125	0.249	1-1/2	144626	18.58	223540	22.30	145814	23.24	224728	27.89
0.084	0.125	0.252	1-1/2	144637	18.58	223551	22.30	145825	23.24	224739	27.89
0.085	0.125	0.255	1-1/2	144648	18.58	223562	22.30	145836	23.24	224750	27.89
0.086	0.125	0.258	1-1/2	144659	18.58	223573	22.30	145847	23.24	224761	27.89
0.087	0.125	0.261	1-1/2	144670	18.58	223584	22.30	145858	23.24	224772	27.89
0.088	0.125	0.264	1-1/2	144681	18.58	223595	22.30	145869	23.24	224783	27.89
0.089	0.125	0.267	1-1/2	144692	18.58	223606	22.30	145880	23.24	224794	27.89
0.090	0.125	0.270	1-1/2	144703	18.58	223617	22.30	145891	23.24	224805	27.89
0.091	0.125	0.273	1-1/2	144714	18.58	223628	22.30	145902	23.24	224816	27.89
0.092	0.125	0.276	1-1/2	144725	18.58	223639	22.30	145913	23.24	224827	27.89
0.093	0.125	0.279	1-1/2	144736	18.58	223650	22.30	145924	23.24	224838	27.89
0.094	0.125	0.282	1-1/2	144747	18.58	223661	22.30	145935	23.24	224849	27.89
0.095	0.125	0.285	1-1/2	144758	18.58	223672	22.30	145946	23.24	224860	27.89
0.096	0.125	0.288	1-1/2	144769	18.58	223683	22.30	145957	23.24	224871	27.89
0.097	0.125	0.291	1-1/2	144780	18.58	223694	22.30	145968	23.24	224882	27.89
0.098	0.125	0.294	1-1/2	144791	18.58	223705	22.30	145979	23.24	224893	27.89
0.099	0.125	0.297	1-1/2	144802	18.58	223716	22.30	145990	23.24	224904	27.89
0.100	0.125	0.300	1-1/2	144813	18.58	223727	22.30	146001	23.24	224915	27.89
0.101	0.125	0.303	1-1/2	144824	18.58	223738	22.30	146012	23.24	224926	27.89
0.102	0.125	0.306	1-1/2	144835	18.58	223749	22.30	146023	23.24	224937	27.89
0.103	0.125	0.309	1-1/2	144846	18.58	223760	22.30	146034	23.24	224948	27.89
0.104	0.125	0.312	1-1/2	144857	18.58	223771	22.30	146045	23.24	224959	27.89
0.105	0.125	0.315	1-1/2	144868	18.58	223782	22.30	146056	23.24	224970	27.89
0.106	0.125	0.318	1-1/2	144879	18.58	223793	22.30	146067	23.24	224981	27.89
0.107	0.125	0.321	1-1/2	144890	18.58	223804	22.30	146078	23.24	224992	27.89
0.108	0.125	0.324	1-1/2	144901	18.58	223815	22.30	146089	23.24	225003	27.89
0.109	0.125	0.327	1-1/2	144912	18.58	223826	22.30	146100	23.24	225014	27.89
0.110	0.125	0.330	1-1/2	144923	18.58	223837	22.30	146111	23.24	225025	27.89
0.115	0.125	0.345	1-1/2	144934	18.58	223848	22.30	146122	23.24	225036	27.89
0.120	0.125	0.360	1-1/2	144945	18.58	223859	22.30	146133	23.24	225047	27.89

LENGTH OF CUT = 3 X DIAMETER

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

MADE IN THE USA

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Micro Endmills

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	38.07	225058	45.68	147277	47.60	226191	57.11
0.011	0.125	0.033	1-1/2	146155	34.07	225069	40.88	147288	42.60	226202	51.14
0.012	0.125	0.036	1-1/2	146166	34.07	225080	40.88	147299	42.60	226213	51.14
0.013	0.125	0.039	1-1/2	146177	28.19	225091	33.83	147310	35.28	226224	42.33
0.014	0.125	0.042	1-1/2	146188	28.19	225102	33.83	147321	35.28	226235	42.33
0.015	0.125	0.045	1-1/2	146199	23.83	225113	28.58	147332	29.78	226246	35.73
0.016	0.125	0.048	1-1/2	146210	23.83	225124	28.58	147343	29.78	226257	35.73
0.017	0.125	0.051	1-1/2	146221	23.83	225135	28.58	147354	29.78	226268	35.73
0.018	0.125	0.054	1-1/2	146232	23.83	225146	28.58	147365	29.78	226279	35.73
0.019	0.125	0.057	1-1/2	146243	23.83	225157	28.58	147376	29.78	226290	35.73
0.020	0.125	0.060	1-1/2	146254	21.65	225168	25.98	147387	27.08	226301	32.48
0.021	0.125	0.063	1-1/2	146265	21.65	225179	25.98	147398	27.08	226312	32.48
0.022	0.125	0.066	1-1/2	146276	21.65	225190	25.98	147409	27.08	226323	32.48
0.023	0.125	0.069	1-1/2	146287	21.65	225201	25.98	147420	27.08	226334	32.48
0.024	0.125	0.072	1-1/2	146298	21.65	225212	25.98	147431	27.08	226345	32.48
0.025	0.125	0.075	1-1/2	146309	21.65	225223	25.98	147442	27.08	226356	32.48
0.026	0.125	0.078	1-1/2	146320	20.33	225234	24.39	147453	25.40	226367	30.47
0.027	0.125	0.081	1-1/2	146331	20.33	225245	24.39	147464	25.40	226378	30.47
0.028	0.125	0.084	1-1/2	146342	20.33	225256	24.39	147475	25.40	226389	30.47
0.029	0.125	0.087	1-1/2	146353	20.33	225267	24.39	147486	25.40	226400	30.47
0.030	0.125	0.090	1-1/2	146364	20.33	225278	24.39	147497	25.40	226411	30.47
0.031	0.125	0.093	1-1/2	146375	19.04	225289	22.85	147508	23.83	226422	28.58
0.032	0.125	0.096	1-1/2	146386	19.04	225300	22.85	147519	23.83	226433	28.58
0.033	0.125	0.099	1-1/2	146397	19.04	225311	22.85	147530	23.83	226444	28.58
0.034	0.125	0.102	1-1/2	146408	19.04	225322	22.85	147541	23.83	226455	28.58
0.035	0.125	0.105	1-1/2	146419	19.04	225333	22.85	147552	23.83	226466	28.58
0.036	0.125	0.108	1-1/2	146430	19.04	225344	22.85	147563	23.83	226477	28.58
0.037	0.125	0.111	1-1/2	146441	19.04	225355	22.85	147574	23.83	226488	28.58
0.038	0.125	0.114	1-1/2	146452	19.04	225366	22.85	147585	23.83	226499	28.58
0.039	0.125	0.117	1-1/2	146463	19.04	225377	22.85	147596	23.83	226510	28.58
0.040	0.125	0.120	1-1/2	146474	19.04	225388	22.85	147607	23.83	226521	28.58
0.041	0.125	0.123	1-1/2	146485	19.04	225399	22.85	147618	23.83	226532	28.58
0.042	0.125	0.126	1-1/2	146496	19.04	225410	22.85	147629	23.83	226543	28.58
0.043	0.125	0.129	1-1/2	146507	19.04	225421	22.85	147640	23.83	226554	28.58
0.044	0.125	0.132	1-1/2	146518	18.58	225432	22.30	147651	23.24	226565	27.89
0.045	0.125	0.135	1-1/2	146529	18.58	225443	22.30	147662	23.24	226576	27.89
0.046	0.125	0.138	1-1/2	146540	18.58	225454	22.30	147673	23.24	226587	27.89
0.047	0.125	0.141	1-1/2	146551	18.58	225465	22.30	147684	23.24	226598	27.89
0.048	0.125	0.144	1-1/2	146562	18.58	225476	22.30	147695	23.24	226609	27.89
0.049	0.125	0.147	1-1/2	146573	18.58	225487	22.30	147706	23.24	226620	27.89
0.050	0.125	0.150	1-1/2	146584	18.58	225498	22.30	147717	23.24	226631	27.89
0.051	0.125	0.153	1-1/2	146595	18.58	225509	22.30	147728	23.24	226642	27.89
0.052	0.125	0.156	1-1/2	146606	18.58	225520	22.30	147739	23.24	226653	27.89
0.053	0.125	0.159	1-1/2	146617	18.58	225531	22.30	147750	23.24	226664	27.89
0.054	0.125	0.162	1-1/2	146628	18.58	225542	22.30	147761	23.24	226675	27.89
0.055	0.125	0.165	1-1/2	146639	18.58	225553	22.30	147772	23.24	226686	27.89
0.056	0.125	0.168	1-1/2	146650	18.58	225564	22.30	147783	23.24	226697	27.89
0.057	0.125	0.171	1-1/2	146661	18.58	225575	22.30	147794	23.24	226708	27.89
0.058	0.125	0.174	1-1/2	146672	18.58	225586	22.30	147805	23.24	226719	27.89

LENGTH OF CUT = 3 X DIAMETER

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

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

Solid Carbide Micro Endmills



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	18.58	225597	22.30	147816	23.24	226730	27.89
0.060	0.125	0.180	1-1/2	146694	18.58	225608	22.30	147827	23.24	226741	27.89
0.061	0.125	0.183	1-1/2	146705	18.58	225619	22.30	147838	23.24	226752	27.89
0.062	0.125	0.186	1-1/2	146716	18.58	225630	22.30	147849	23.24	226763	27.89
0.063	0.125	0.189	1-1/2	146727	18.58	225641	22.30	147860	23.24	226774	27.89
0.064	0.125	0.192	1-1/2	146738	18.58	225652	22.30	147871	23.24	226785	27.89
0.065	0.125	0.195	1-1/2	146749	18.58	225663	22.30	147882	23.24	226796	27.89
0.066	0.125	0.198	1-1/2	146760	18.58	225674	22.30	147893	23.24	226807	27.89
0.067	0.125	0.201	1-1/2	146771	18.58	225685	22.30	147904	23.24	226818	27.89
0.068	0.125	0.204	1-1/2	146782	18.58	225696	22.30	147915	23.24	226829	27.89
0.069	0.125	0.207	1-1/2	146793	18.58	225707	22.30	147926	23.24	226840	27.89
0.070	0.125	0.210	1-1/2	146804	18.58	225718	22.30	147937	23.24	226851	27.89
0.071	0.125	0.213	1-1/2	146815	18.58	225729	22.30	147948	23.24	226862	27.89
0.072	0.125	0.216	1-1/2	146826	18.58	225740	22.30	147959	23.24	226873	27.89
0.073	0.125	0.219	1-1/2	146837	18.58	225751	22.30	147970	23.24	226884	27.89
0.074	0.125	0.222	1-1/2	146848	18.58	225762	22.30	147981	23.24	226895	27.89
0.075	0.125	0.225	1-1/2	146859	18.58	225773	22.30	147992	23.24	226906	27.89
0.076	0.125	0.228	1-1/2	146870	18.58	225784	22.30	148003	23.24	226917	27.89
0.077	0.125	0.231	1-1/2	146881	18.58	225795	22.30	148014	23.24	226928	27.89
0.078	0.125	0.234	1-1/2	146892	18.58	225806	22.30	148025	23.24	226939	27.89
0.079	0.125	0.237	1-1/2	146903	18.58	225817	22.30	148036	23.24	226950	27.89
0.080	0.125	0.240	1-1/2	146914	18.58	225828	22.30	148047	23.24	226961	27.89
0.081	0.125	0.243	1-1/2	146925	18.58	225839	22.30	148058	23.24	226972	27.89
0.082	0.125	0.246	1-1/2	146936	18.58	225850	22.30	148069	23.24	226983	27.89
0.083	0.125	0.249	1-1/2	146947	18.58	225861	22.30	148080	23.24	226994	27.89
0.084	0.125	0.252	1-1/2	146958	18.58	225872	22.30	148091	23.24	227005	27.89
0.085	0.125	0.255	1-1/2	146969	18.58	225883	22.30	148102	23.24	227016	27.89
0.086	0.125	0.258	1-1/2	146980	18.58	225894	22.30	148113	23.24	227027	27.89
0.087	0.125	0.261	1-1/2	146991	18.58	225905	22.30	148124	23.24	227038	27.89
0.088	0.125	0.264	1-1/2	147002	18.58	225916	22.30	148135	23.24	227049	27.89
0.089	0.125	0.267	1-1/2	147013	18.58	225927	22.30	148146	23.24	227060	27.89
0.090	0.125	0.270	1-1/2	147024	18.58	225938	22.30	148157	23.24	227071	27.89
0.091	0.125	0.273	1-1/2	147035	18.58	225949	22.30	148168	23.24	227082	27.89
0.092	0.125	0.276	1-1/2	147046	18.58	225960	22.30	148179	23.24	227093	27.89
0.093	0.125	0.279	1-1/2	147057	18.58	225971	22.30	148190	23.24	227104	27.89
0.094	0.125	0.282	1-1/2	147068	18.58	225982	22.30	148201	23.24	227115	27.89
0.095	0.125	0.285	1-1/2	147079	18.58	225993	22.30	148212	23.24	227126	27.89
0.096	0.125	0.288	1-1/2	147090	18.58	226004	22.30	148223	23.24	227137	27.89
0.097	0.125	0.291	1-1/2	147101	18.58	226015	22.30	148234	23.24	227148	27.89
0.098	0.125	0.294	1-1/2	147112	18.58	226026	22.30	148245	23.24	227159	27.89
0.099	0.125	0.297	1-1/2	147123	18.58	226037	22.30	148256	23.24	227170	27.89
0.100	0.125	0.300	1-1/2	147134	18.58	226048	22.30	148267	23.24	227181	27.89
0.101	0.125	0.303	1-1/2	147145	18.58	226059	22.30	148278	23.24	227192	27.89
0.102	0.125	0.306	1-1/2	147156	18.58	226070	22.30	148289	23.24	227203	27.89
0.103	0.125	0.309	1-1/2	147167	18.58	226081	22.30	148300	23.24	227214	27.89
0.104	0.125	0.312	1-1/2	147178	18.58	226092	22.30	148311	23.24	227225	27.89
0.105	0.125	0.315	1-1/2	147189	18.58	226103	22.30	148322	23.24	227236	27.89
0.106	0.125	0.318	1-1/2	147200	18.58	226114	22.30	148333	23.24	227247	27.89
0.107	0.125	0.321	1-1/2	147211	18.58	226125	22.30	148344	23.24	227258	27.89
0.108	0.125	0.324	1-1/2	147222	18.58	226136	22.30	148355	23.24	227269	27.89
0.109	0.125	0.327	1-1/2	147233	18.58	226147	22.30	148366	23.24	227280	27.89
0.110	0.125	0.330	1-1/2	147244	18.58	226158	22.30	148377	23.24	227291	27.89
0.115	0.125	0.345	1-1/2	147255	18.58	226169	22.30	148388	23.24	227302	27.89
0.120	0.125	0.360	1-1/2	147266	18.58	226180	22.30	148399	23.24	227313	27.89

LENGTH OF CUT = 3 X DIAMETER

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

MADE IN THE USA

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Micro Endmills

2 FLUTE - STUB FLUTE - 30° HELIX



**SQUARE END
UNCOATED**



**BALL NOSE
UNCOATED**



**SQUARE END
ALTIM COATED**



**BALL NOSE
ALTIM COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIM	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIM	LIST PRICE
0.005	0.125	0.008	1-1/2	220526	48.85	220801	58.61	221076	61.06	221351	73.28
0.010	0.125	0.015	1-1/2	220537	43.78	220812	52.54	221087	54.74	221362	65.67
0.015	0.125	0.023	1-1/2	220548	27.39	220823	32.88	221098	34.25	221373	41.09
0.020	0.125	0.030	1-1/2	220559	24.90	220834	29.88	221109	31.13	221384	37.36
0.025	0.125	0.038	1-1/2	220570	24.90	220845	29.88	221120	31.13	221395	37.36
0.030	0.125	0.045	1-1/2	220581	23.37	220856	28.04	221131	29.21	221406	35.05
0.031	0.125	0.047	1-1/2	220592	21.89	220867	26.27	221142	27.39	221417	32.88
0.035	0.125	0.053	1-1/2	220603	21.89	220878	26.27	221153	27.39	221428	32.88
0.040	0.125	0.060	1-1/2	220614	21.89	220889	26.27	221164	27.39	221439	32.88
0.045	0.125	0.068	1-1/2	220625	21.37	220900	25.64	221175	26.73	221450	32.09
0.047	0.125	0.071	1-1/2	220636	21.37	220911	25.64	221186	26.73	221461	32.09
0.050	0.125	0.075	1-1/2	220647	21.37	220922	25.64	221197	26.73	221472	32.09
0.055	0.125	0.083	1-1/2	220658	21.37	220933	25.64	221208	26.73	221483	32.09
0.060	0.125	0.090	1-1/2	220669	21.37	220944	25.64	221219	26.73	221494	32.09
0.062	0.125	0.093	1-1/2	220680	21.37	220955	25.64	221230	26.73	221505	32.09
0.065	0.125	0.098	1-1/2	220691	21.37	220966	25.64	221241	26.73	221516	32.09
0.070	0.125	0.105	1-1/2	220702	21.37	220977	25.64	221252	26.73	221527	32.09
0.075	0.125	0.113	1-1/2	220713	21.37	220988	25.64	221263	26.73	221538	32.09
0.078	0.125	0.117	1-1/2	220724	21.37	220999	25.64	221274	26.73	221549	32.09
0.080	0.125	0.120	1-1/2	220735	21.37	221010	25.64	221285	26.73	221560	32.09
0.085	0.125	0.128	1-1/2	220746	21.37	221021	25.64	221296	26.73	221571	32.09
0.090	0.125	0.135	1-1/2	220757	21.37	221032	25.64	221307	26.73	221582	32.09
0.093	0.125	0.140	1-1/2	220768	21.37	221043	25.64	221318	26.73	221593	32.09
0.095	0.125	0.143	1-1/2	220779	21.37	221054	25.64	221329	26.73	221604	32.09
0.100	0.125	0.150	1-1/2	220790	21.37	221065	25.64	221340	26.73	221615	32.09

LENGTH OF CUT = 1.5 X DIAMETER

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

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

CARBIDE MICRO ENDMILLS

Solid Carbide Micro Endmills



4 FLUTE - STUB FLUTE - 30° HELIX



**SQUARE END
UNCOATED**



**BALL NOSE
UNCOATED**



**SQUARE END
ALTIM COATED**



**BALL NOSE
ALTIM COATED**

SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	SQUARE END UNCOATED	LIST PRICE	SQUARE END ALTIM	LIST PRICE	BALL NOSE UNCOATED	LIST PRICE	BALL NOSE ALTIM	LIST PRICE
0.010	0.125	0.015	1-1/2	221626	43.78	221890	52.54	222154	47.60	222418	65.67
0.015	0.125	0.023	1-1/2	221637	27.39	221901	32.88	222165	29.78	222429	41.09
0.020	0.125	0.030	1-1/2	221648	24.90	221912	29.88	222176	27.08	222440	37.36
0.025	0.125	0.038	1-1/2	221659	24.90	221923	29.88	222187	27.08	222451	37.36
0.030	0.125	0.045	1-1/2	221670	23.37	221934	28.04	222198	25.40	222462	35.05
0.031	0.125	0.047	1-1/2	221681	21.89	221945	26.27	222209	23.83	222473	32.88
0.035	0.125	0.053	1-1/2	221692	21.89	221956	26.27	222220	23.83	222484	32.88
0.040	0.125	0.060	1-1/2	221703	21.89	221967	26.27	222231	23.83	222495	32.88
0.045	0.125	0.068	1-1/2	221714	21.37	221978	25.64	222242	23.24	222506	32.09
0.047	0.125	0.071	1-1/2	221725	21.37	221989	25.64	222253	23.24	222517	32.09
0.050	0.125	0.075	1-1/2	221736	21.37	222000	25.64	222264	23.24	222528	32.09
0.055	0.125	0.083	1-1/2	221747	21.37	222011	25.64	222275	23.24	222539	32.09
0.060	0.125	0.090	1-1/2	221758	21.37	222022	25.64	222286	23.24	222550	32.09
0.062	0.125	0.093	1-1/2	221769	21.37	222033	25.64	222297	23.24	222561	32.09
0.065	0.125	0.098	1-1/2	221780	21.37	222044	25.64	222308	23.24	222572	32.09
0.070	0.125	0.105	1-1/2	221791	21.37	222055	25.64	222319	23.24	222583	32.09
0.075	0.125	0.113	1-1/2	221802	21.37	222066	25.64	222330	23.24	222594	32.09
0.078	0.125	0.117	1-1/2	221813	21.37	222077	25.64	222341	23.24	222605	32.09
0.080	0.125	0.120	1-1/2	221824	21.37	222088	25.64	222352	23.24	222616	32.09
0.085	0.125	0.128	1-1/2	221835	21.37	222099	25.64	222363	23.24	222627	32.09
0.090	0.125	0.135	1-1/2	221846	21.37	222110	25.64	222374	23.24	222638	32.09
0.093	0.125	0.140	1-1/2	221857	21.37	222121	25.64	222385	23.24	222649	32.09
0.095	0.125	0.143	1-1/2	221868	21.37	222132	25.64	222396	23.24	222660	32.09
0.100	0.125	0.150	1-1/2	221879	21.37	222143	25.64	222407	23.24	222671	32.09

LENGTH OF CUT = 1.5 X DIAMETER

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

MADE IN THE USA

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



Solid Carbide Micro Endmills

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



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	UNCOATED LIST PRICE	ALTiN LIST PRICE
0.015	0.125	0.023	1-1/2	0.003	218722 57.94	219173 71.84
0.020	0.125	0.030	1-1/2	0.005	218733 54.08	219184 67.05
0.025	0.125	0.038	1-1/2	0.005	218744 54.08	219195 67.05
0.030	0.125	0.045	1-1/2	0.005	218755 38.63	219206 47.90
0.030	0.125	0.045	1-1/2	0.010	218766 38.63	219217 47.90
0.031	0.125	0.047	1-1/2	0.005	218777 38.63	219228 47.90
0.031	0.125	0.047	1-1/2	0.010	218788 38.63	219239 47.90
0.035	0.125	0.053	1-1/2	0.005	218799 38.63	219250 47.90
0.035	0.125	0.053	1-1/2	0.010	218810 38.63	219261 47.90
0.040	0.125	0.060	1-1/2	0.005	218821 38.63	219272 47.90
0.040	0.125	0.060	1-1/2	0.010	218832 38.63	219283 47.90
0.045	0.125	0.068	1-1/2	0.005	218843 38.63	219294 47.90
0.045	0.125	0.068	1-1/2	0.010	218854 38.63	219305 47.90
0.045	0.125	0.068	1-1/2	0.015	218865 38.63	219316 47.90
0.047	0.125	0.071	1-1/2	0.005	218876 38.63	219327 47.90
0.047	0.125	0.071	1-1/2	0.010	218887 38.63	219338 47.90
0.047	0.125	0.071	1-1/2	0.015	218898 38.63	219349 47.90
0.050	0.125	0.075	1-1/2	0.005	218909 38.63	219360 47.90
0.050	0.125	0.075	1-1/2	0.010	218920 38.63	219371 47.90
0.050	0.125	0.075	1-1/2	0.015	218931 38.63	219382 47.90
0.060	0.125	0.090	1-1/2	0.005	218942 38.63	219393 47.90
0.060	0.125	0.090	1-1/2	0.010	218953 38.63	219404 47.90
0.060	0.125	0.090	1-1/2	0.015	218964 38.63	219415 47.90
0.062	0.125	0.093	1-1/2	0.005	218975 38.63	219426 47.90
0.062	0.125	0.093	1-1/2	0.010	218986 38.63	219437 47.90
0.062	0.125	0.093	1-1/2	0.015	218997 38.63	219448 47.90
0.075	0.125	0.113	1-1/2	0.005	219008 38.63	219459 47.90
0.075	0.125	0.113	1-1/2	0.010	219019 38.63	219470 47.90
0.075	0.125	0.113	1-1/2	0.015	219030 38.63	219481 47.90
0.078	0.125	0.117	1-1/2	0.005	219041 38.63	219492 47.90
0.078	0.125	0.117	1-1/2	0.010	219052 38.63	219503 47.90
0.078	0.125	0.117	1-1/2	0.015	219063 38.63	219514 47.90
0.090	0.125	0.135	1-1/2	0.005	219074 38.63	219525 47.90
0.090	0.125	0.135	1-1/2	0.010	219085 38.63	219536 47.90
0.090	0.125	0.135	1-1/2	0.015	219096 38.63	219547 47.90
0.093	0.125	0.140	1-1/2	0.005	219107 38.63	219558 47.90
0.093	0.125	0.140	1-1/2	0.010	219118 38.63	219569 47.90
0.093	0.125	0.140	1-1/2	0.015	219129 38.63	219580 47.90
0.100	0.125	0.150	1-1/2	0.005	219140 38.63	219591 47.90
0.100	0.125	0.150	1-1/2	0.010	219151 38.63	219602 47.90
0.100	0.125	0.150	1-1/2	0.015	219162 38.63	219613 47.90

LENGTH OF CUT = 1.5 X DIAMETER

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

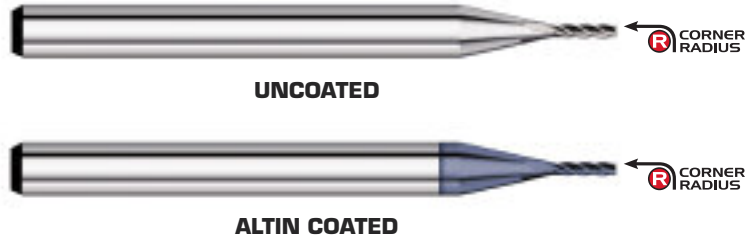
CARBIDE ENDMILLS
CARBIDE THREADMILLS
CARBIDE DRILL MILLS
CARBIDE DRILLS
CARBIDE REAMERS
CARBIDE BURS
COUNTERSINKS
TAPS & DIES
HSS & COBALT DRILLS
HSS & COBALT ENDMILLS
HSS & COBALT REAMERS

CARBIDE MICRO ENDMILLS

Solid Carbide Micro Endmills



® CORNER RADIUS - 4 FLUTE - 30° HELIX



SIZE	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	R RADIUS	UNCOATED LIST PRICE	ALTiN LIST PRICE
0.015	0.125	0.045	1-1/2	0.003	219624 57.94	220075 71.84
0.020	0.125	0.060	1-1/2	0.005	219635 54.08	220086 67.05
0.025	0.125	0.075	1-1/2	0.005	219646 54.08	220097 67.05
0.030	0.125	0.090	1-1/2	0.005	219657 38.63	220108 47.90
0.030	0.125	0.090	1-1/2	0.010	219668 38.63	220119 47.90
0.031	0.125	0.093	1-1/2	0.005	219679 38.63	220130 47.90
0.031	0.125	0.093	1-1/2	0.010	219690 38.63	220141 47.90
0.035	0.125	0.105	1-1/2	0.005	219701 38.63	220152 47.90
0.035	0.125	0.105	1-1/2	0.010	219712 38.63	220163 47.90
0.040	0.125	0.120	1-1/2	0.005	219723 38.63	220174 47.90
0.040	0.125	0.120	1-1/2	0.010	219734 38.63	220185 47.90
0.045	0.125	0.135	1-1/2	0.005	219745 38.63	220196 47.90
0.045	0.125	0.135	1-1/2	0.010	219756 38.63	220207 47.90
0.045	0.125	0.135	1-1/2	0.015	219767 38.63	220218 47.90
0.047	0.125	0.141	1-1/2	0.005	219778 38.63	220229 47.90
0.047	0.125	0.141	1-1/2	0.010	219789 38.63	220240 47.90
0.047	0.125	0.141	1-1/2	0.015	219800 38.63	220251 47.90
0.050	0.125	0.150	1-1/2	0.005	219811 38.63	220262 47.90
0.050	0.125	0.150	1-1/2	0.010	219822 38.63	220273 47.90
0.050	0.125	0.150	1-1/2	0.015	219833 38.63	220284 47.90
0.060	0.125	0.180	1-1/2	0.005	219844 38.63	220295 47.90
0.060	0.125	0.180	1-1/2	0.010	219855 38.63	220306 47.90
0.060	0.125	0.180	1-1/2	0.015	219866 38.63	220317 47.90
0.062	0.125	0.186	1-1/2	0.005	219877 38.63	220328 47.90
0.062	0.125	0.186	1-1/2	0.010	219888 38.63	220339 47.90
0.062	0.125	0.186	1-1/2	0.015	219899 38.63	220350 47.90
0.075	0.125	0.225	1-1/2	0.005	219910 38.63	220361 47.90
0.075	0.125	0.225	1-1/2	0.010	219921 38.63	220372 47.90
0.075	0.125	0.225	1-1/2	0.015	219932 38.63	220383 47.90
0.078	0.125	0.234	1-1/2	0.005	219943 38.63	220394 47.90
0.078	0.125	0.234	1-1/2	0.010	219954 38.63	220405 47.90
0.078	0.125	0.234	1-1/2	0.015	219965 38.63	220416 47.90
0.090	0.125	0.270	1-1/2	0.005	219976 38.63	220427 47.90
0.090	0.125	0.270	1-1/2	0.010	219987 38.63	220438 47.90
0.090	0.125	0.270	1-1/2	0.015	219998 38.63	220449 47.90
0.093	0.125	0.279	1-1/2	0.005	220009 38.63	220460 47.90
0.093	0.125	0.279	1-1/2	0.010	220020 38.63	220471 47.90
0.093	0.125	0.279	1-1/2	0.015	220031 38.63	220482 47.90
0.100	0.125	0.300	1-1/2	0.005	220042 38.63	220493 47.90
0.100	0.125	0.300	1-1/2	0.010	220053 38.63	220504 47.90
0.100	0.125	0.300	1-1/2	0.015	220064 38.63	220515 47.90

LENGTH OF CUT = 3.0 X DIAMETER

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

MADE IN THE USA

CARBIDE MICRO ENDMILLS

CARBIDE ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Micro Endmills

4 FLUTE - SQUARE END - 30° HELIX



**UNCOATED
METRIC**

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1.0	3.0	3.0	38	216753	15.36
1.5	3.0	4.2	38	133758	15.36
2.0	3.0	6.0	38	133769	15.36
2.5	3.0	8.0	38	133780	15.36
3.0	3.0	12.0	38	133791	15.36

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)



**ALTiN COATED
METRIC**

SIZE (mm)	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	ITEM#	LIST PRICE
1.0	3.0	3.0	38	216764	19.20
1.5	3.0	4.2	38	133978	19.20
2.0	3.0	6.0	38	133989	19.20
2.5	3.0	8.0	38	134000	19.20
3.0	3.0	12.0	38	134011	19.20

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

**LENGTH OF CUT = 3 X DIAMETER
SEE PAGE 36 FOR METRIC SIZES OVER 3.0mm**

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



ALL TOOLS ARE 100% MADE IN THE USA

CARBIDE
ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS

CARBIDE MICRO ENDMILLS

Solid Carbide Threadmills



INTERNAL / EXTERNAL THREADS



UN THREADS - ALTIN COATED

SIZE	SHANK DIAMETER	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
6 - 32	1/8	0.100	0.218	2	3	156253	134.31
8 - 32	1/8	0.115	0.250	2	3	156264	134.31
8 - 36	1/8	0.115	0.250	2	3	156275	134.31
10 - 24	3/16	0.120	0.312	2	3	156286	134.31
10 - 32	3/16	0.120	0.312	2	3	156297	134.31
1/4 - 20	3/16	0.180	0.500	2-1/2	3	156308	151.91
1/4 - 28	3/16	0.180	0.500	2-1/2	3	156319	151.91
5/16 - 18	1/4	0.240	0.625	2-1/2	3	156330	178.77
5/16 - 24	1/4	0.240	0.625	2-1/2	3	156341	178.77
3/8 - 16	5/16	0.290	0.750	3	4	156352	213.04
3/8 - 24	5/16	0.290	0.750	3	4	156363	213.04
7/16 - 14	3/8	0.340	0.875	3	4	156374	229.72
7/16 - 20	3/8	0.340	0.875	3	4	156385	229.72
1/2 - 13	3/8	0.350	0.875	3-1/2	4	156396	229.72
1/2 - 20	3/8	0.350	0.875	3-1/2	4	156407	229.72
9/16 - 12	1/2	0.370	0.875	3-1/2	4	156418	229.72
9/16 - 18	1/2	0.370	0.875	3-1/2	4	156429	229.72
5/8 - 11	1/2	0.470	1.250	3-1/2	5	156440	287.15
5/8 - 18	1/2	0.470	1.250	3-1/2	5	156451	287.15
3/4 - 10	1/2	0.495	1.250	3-1/2	5	156462	287.15
3/4 - 16	1/2	0.495	1.250	3-1/2	5	156473	287.15
7/8 - 9	5/8	0.620	1.250	3-1/2	5	156484	359.40
7/8 - 14	5/8	0.620	1.250	3-1/2	5	156495	359.40
1 - 8	3/4	0.620	1.375	4	5	156506	359.40
1 - 12	3/4	0.620	1.375	4	5	156517	359.40

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	178.77
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156539	178.77
1/4 - 18	3/8	0.370	0.625	3	4	156550	203.77
3/8 - 18	3/8	0.370	0.625	3	4	156561	203.77
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156572	287.15
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156583	287.15
1 - 11-1/2	3/4	0.620	1.125	4	5	156594	359.40

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	178.77
1/8 - 27	5/16	0.310	0.437	2-1/2	4	156616	178.77
1/4 - 18	3/8	0.370	0.625	3	4	156627	203.77
3/8 - 18	3/8	0.370	0.625	3	4	156638	203.77
1/2 - 14	1/2	0.495	0.875	3-1/2	4	156649	287.15
3/4 - 14	1/2	0.495	0.875	3-1/2	4	156660	287.15
1 - 11-1/2	3/4	0.620	1.125	4	5	156671	359.40

THREADMILL CUTTING DIAMETER TOLERANCE +0.00, -.002

MADE IN THE USA

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



Solid Carbide Threadmills

INTERNAL / EXTERNAL THREADS



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	137.09
M4.5 x 0.75	1/8	0.120	0.250	2	3	156693	137.09
M5 x 0.80	3/16	0.120	0.312	2	3	156704	137.09
M6 x 1.00	3/16	0.170	0.500	2-1/2	3	156715	150.98
M8 x 0.75	1/4	0.235	0.625	2-1/2	3	156726	178.77
M8 x 1.00	1/4	0.235	0.625	2-1/2	3	156737	178.77
M8 x 1.25	1/4	0.235	0.625	2-1/2	3	156748	178.77
M10 x 1.25	5/16	0.300	0.750	3	4	156759	213.04
M10 x 1.50	5/16	0.300	0.750	3	4	156770	213.04
M12 x 1.00	3/8	0.360	0.875	3-1/2	4	156781	230.64
M12 x 1.25	3/8	0.360	0.875	3-1/2	4	156792	230.64
M12 x 1.75	3/8	0.360	0.875	3-1/2	4	156803	230.64
M14 x 1.50	3/8	0.360	0.875	3-1/2	4	156814	230.64
M16 x 2.00	1/2	0.470	1.250	3-1/2	5	156825	287.15
M18 x 2.50	1/2	0.470	1.250	3-1/2	5	156836	287.15
M20 x 3.00	5/8	0.470	1.250	3-1/2	5	156847	287.15

THREADMILLS - SPEEDS & FEEDS AND FEEDRATE ADJUSTMENT

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

THREADMILLS - CALCULATION FORMULAS

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

THREADMILL CUTTING DIAMETER TOLERANCE

+ .000, -.002

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

CARBIDE THREADMILLS

Solid Carbide Drill Mills



2 FLUTE - 60° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	242034	18.09
1/16	1/8	3/16	1-1/2	2	242045	18.09
3/32	1/8	3/8	1-1/2	2	242056	18.09
1/8	1/8	1/2	1-1/2	2	242067	17.36
3/16	3/16	5/8	2	2	242078	24.43
1/4	1/4	3/4	2-1/2	2	242089	30.58
5/16	5/16	13/16	2-1/2	2	242100	37.94
3/8	3/8	1	2-1/2	2	242111	47.69
7/16	7/16	1	2-3/4	2	242122	64.49
1/2	1/2	1	3	2	242133	79.06
5/8	5/8	1-1/4	3-1/2	2	242144	150.95
3/4	3/4	1-1/2	4	2	242155	222.32



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	22.62
1/16	1/8	3/16	1-1/2	2	242177	22.62
3/32	1/8	3/8	1-1/2	2	242188	22.62
1/8	1/8	1/2	1-1/2	2	242199	21.71
3/16	3/16	5/8	2	2	242210	30.54
1/4	1/4	3/4	2-1/2	2	242221	38.22
5/16	5/16	13/16	2-1/2	2	242232	47.43
3/8	3/8	1	2-1/2	2	242243	59.63
7/16	7/16	1	2-3/4	2	242254	80.61
1/2	1/2	1	3	2	242265	98.83
5/8	5/8	1-1/4	3-1/2	2	242276	188.69
3/4	3/4	1-1/2	4	2	242287	277.91

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

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

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



Solid Carbide Drill Mills

4 FLUTE - 60° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	242628	18.09
1/16	1/8	3/16	1-1/2	4	242639	18.09
3/32	1/8	3/8	1-1/2	4	242650	18.09
1/8	1/8	1/2	1-1/2	4	242661	17.36
3/16	3/16	5/8	2	4	242672	24.43
1/4	1/4	3/4	2-1/2	4	242683	30.58
5/16	5/16	13/16	2-1/2	4	242694	37.94
3/8	3/8	1	2-1/2	4	242705	47.69
7/16	7/16	1	2-3/4	4	242716	64.49
1/2	1/2	1	3	4	242727	79.06
5/8	5/8	1-1/4	3-1/2	4	242738	150.95
3/4	3/4	1-1/2	4	4	242749	222.32



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	22.62
1/16	1/8	3/16	1-1/2	4	242771	22.62
3/32	1/8	3/8	1-1/2	4	242782	22.62
1/8	1/8	1/2	1-1/2	4	242793	21.71
3/16	3/16	5/8	2	4	242804	30.54
1/4	1/4	3/4	2-1/2	4	242815	38.22
5/16	5/16	13/16	2-1/2	4	242826	47.43
3/8	3/8	1	2-1/2	4	242837	59.63
7/16	7/16	1	2-3/4	4	242848	80.61
1/2	1/2	1	3	4	242859	98.83
5/8	5/8	1-1/4	3-1/2	4	242870	188.69
3/4	3/4	1-1/2	4	4	242881	277.91

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

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

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

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

CARBIDE DRILL MILLS

Solid Carbide Drill Mills



2 FLUTE - 90° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	241545	18.09
1/16	1/8	3/16	1-1/2	2	241550	18.09
3/32	1/8	3/8	1-1/2	2	241561	18.09
1/8	1/8	1/2	1-1/2	2	241572	17.36
3/16	3/16	5/8	2	2	241583	24.43
1/4	1/4	3/4	2-1/2	2	241594	30.58
5/16	5/16	13/16	2-1/2	2	241605	37.94
3/8	3/8	1	2-1/2	2	241616	47.69
7/16	7/16	1	2-3/4	2	241627	64.49
1/2	1/2	1	3	2	241638	79.06
5/8	5/8	1-1/4	3-1/2	2	241649	150.95
3/4	3/4	1-1/2	4	2	241660	222.32



ALTIN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	2	241668	22.62
1/16	1/8	3/16	1-1/2	2	241671	22.62
3/32	1/8	3/8	1-1/2	2	241682	22.62
1/8	1/8	1/2	1-1/2	2	241693	21.71
3/16	3/16	5/8	2	2	241704	30.54
1/4	1/4	3/4	2-1/2	2	241715	38.22
5/16	5/16	13/16	2-1/2	2	241726	47.43
3/8	3/8	1	2-1/2	2	241737	59.63
7/16	7/16	1	2-3/4	2	241748	80.61
1/2	1/2	1	3	2	241759	98.83
5/8	5/8	1-1/4	3-1/2	2	241770	188.69
3/4	3/4	1-1/2	4	2	241781	277.91

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

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

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



Solid Carbide Drill Mills

4 FLUTE - 90° POINT - 30° HELIX



UNCOATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	ITEM#	LIST PRICE
1/32	1/8	1/8	1-1/2	4	241785	18.09
1/16	1/8	3/16	1-1/2	4	241792	18.09
3/32	1/8	3/8	1-1/2	4	241803	18.09
1/8	1/8	1/2	1-1/2	4	241814	17.36
3/16	3/16	5/8	2	4	241825	24.43
1/4	1/4	3/4	2-1/2	4	241836	30.58
5/16	5/16	13/16	2-1/2	4	241847	37.94
3/8	3/8	1	2-1/2	4	241858	47.69
7/16	7/16	1	2-3/4	4	241869	64.49
1/2	1/2	1	3	4	241880	79.06
5/8	5/8	1-1/4	3-1/2	4	241891	150.95
3/4	3/4	1-1/2	4	4	241902	222.32



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	22.62
1/16	1/8	3/16	1-1/2	4	241913	22.62
3/32	1/8	3/8	1-1/2	4	241924	22.62
1/8	1/8	1/2	1-1/2	4	241935	21.71
3/16	3/16	5/8	2	4	241946	30.54
1/4	1/4	3/4	2-1/2	4	241957	38.22
5/16	5/16	13/16	2-1/2	4	241968	47.43
3/8	3/8	1	2-1/2	4	241979	59.63
7/16	7/16	1	2-3/4	4	241990	80.61
1/2	1/2	1	3	4	242001	98.83
5/8	5/8	1-1/4	3-1/2	4	242012	188.69
3/4	3/4	1-1/2	4	4	242023	277.91

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

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

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

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

CARBIDE DRILL MILLS

Solid Carbide Drills



N/C SPOTTING DRILLS



**90° POINT
UNCOATED**



**90° POINT
ALTIN COATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	1/8	1/4	2	138686	21.28	138753	26.60
3/16	3/16	3/8	2	138697	25.33	138754	31.67
1/4	1/4	3/8	3	138708	30.78	138755	38.63
3/8	3/8	1/2	4	138719	48.90	138756	61.13
1/2	1/2	3/4	4	138730	81.75	138757	106.42
5/8	5/8	1	4	138741	145.50	138758	186.02
3/4	3/4	1	4	138752	195.38	138759	244.22



**120° POINT
UNCOATED**



**120° POINT
ALTIN COATED**

SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	1/8	1/4	2	138763	21.28	138830	26.60
3/16	3/16	3/8	2	138774	25.33	138831	31.67
1/4	1/4	3/8	3	138785	30.78	138832	38.63
3/8	3/8	1/2	4	138796	48.90	138833	61.13
1/2	1/2	3/4	4	138807	81.75	138834	106.42
5/8	5/8	1	4	138818	145.50	138835	186.02
3/4	3/4	1	4	138829	195.38	138836	244.22



**140° POINT
UNCOATED**



**140° POINT
ALTIN COATED**

N/C SPOTTING FOR HIGH PERFORMANCE DRILLING							
SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
1/8	1/8	1/4	2	138840	21.28	138907	26.60
3/16	3/16	3/8	2	138851	25.33	138908	31.67
1/4	1/4	3/8	3	138862	30.78	138909	38.63
3/8	3/8	1/2	4	138873	48.90	138910	61.13
1/2	1/2	3/4	4	138884	81.75	138911	106.42
5/8	5/8	1	4	138895	145.50	138912	186.02
3/4	3/4	1	4	138906	195.38	138913	244.22

CARBIDE N/C SPOTTING DRILLS

CARBIDE
ENDMILLS

CARBIDE
MICRO
ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS



Solid Carbide Drills

JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX

UNCOATED



ALTiN COATED



FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/32	5/16	1-1/4	138917	12.01	227324	15.01
3/64	3/4	1-1/2	138928	12.01	227335	15.01
1/16	3/4	1-1/2	138939	11.35	227346	14.19
5/64	7/8	1-3/4	138950	12.01	227357	15.01
3/32	1	2	138961	13.22	227368	16.52
7/64	1-1/4	2-1/4	138972	15.03	227379	18.78
1/8	1-1/4	2-1/4	138983	16.03	227390	20.03
9/64	1-3/8	2-1/2	138994	17.76	227401	22.19
5/32	1-3/8	2-1/2	139005	19.89	227412	24.86
11/64	1-5/8	2-3/4	139016	23.49	227423	29.37
3/16	1-5/8	2-3/4	139027	24.17	227434	30.21
13/64	1-3/4	3	139038	27.91	227445	34.89
7/32	1-3/4	3	139049	30.97	227456	38.72
15/64	2	3-1/4	139060	35.05	227467	43.81
1/4	2	3-1/4	139071	36.85	227478	46.06
17/64	2-1/8	3-1/2	139082	41.50	227489	51.88

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
9/32	2-1/8	3-1/2	139093	43.28	227500	54.10
19/64	2-3/8	3-3/4	139104	48.61	227511	60.77
5/16	2-3/8	3-3/4	139115	51.13	227522	63.92
21/64	2-1/2	4	139126	55.81	227533	69.75
11/32	2-1/2	4	139137	61.03	227544	76.27
23/64	2-3/4	4-1/4	139148	68.23	227555	85.29
3/8	2-3/4	4-1/4	139159	72.37	227566	90.46
25/64	2-7/8	4-1/2	139170	84.72	227577	105.90
13/32	2-7/8	4-1/2	139181	92.79	227588	116.00
27/64	2-7/8	4-1/2	139192	100.93	227599	126.15
7/16	2-7/8	4-1/2	139203	105.60	227610	132.01
29/64	3	4-3/4	139214	122.51	227621	153.13
15/32	3	4-3/4	139225	127.64	227632	159.55
31/64	3	4-3/4	139236	131.24	227643	164.05
1/2	3	4-3/4	139247	131.51	227654	164.40
-	-	-	-	-	-	-

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	14.92	228611	18.65
0.8	12	31	216786	14.92	228622	18.65
0.9	16	38	216797	14.92	228633	18.65
1.0	16	38	216808	14.92	228644	18.65
1.1	19	38	216819	14.92	228655	18.65
1.2	19	38	216830	14.92	228666	18.65
1.3	19	38	216841	14.92	228677	18.65
1.4	19	38	216852	14.92	228688	18.65
1.5	19	38	216863	15.04	228699	18.80
1.6	19	38	216874	15.04	228710	18.80
1.7	19	38	216885	15.04	228721	18.80
1.8	22	38	216896	15.04	228732	18.80
1.9	22	38	216907	15.04	228743	18.80
2.0	22	44	216918	15.95	228754	19.95
2.1	22	44	216929	15.95	228765	19.95
2.2	25	50	216940	15.95	228776	19.95
2.3	25	50	216951	15.95	228787	19.95
2.4	25	50	216962	15.95	228798	19.95
2.5	25	50	216973	18.35	228809	22.93
2.6	32	57	216984	18.35	228820	22.93
2.7	32	57	216995	18.35	228831	22.93
2.8	32	57	217006	18.35	228842	22.93
2.9	32	57	217017	18.35	228853	22.93

METRIC SIZES

SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
3.0	32	57	217028	20.54	228864	25.68
3.1	32	57	217039	20.54	228875	25.68
3.2	32	57	217050	20.54	228886	25.68
3.3	32	57	217061	20.54	228897	25.68
3.4	35	63	217072	22.31	228908	27.90
3.5	35	63	217083	22.31	228919	27.90
4.0	35	63	217094	27.45	228930	34.31
4.5	41	70	217105	29.41	228941	36.76
5.0	44	75	217116	32.52	228952	40.66
5.5	44	75	217127	38.52	228963	48.15
6.0	50	82	217138	40.71	228974	50.90
6.5	50	82	217149	64.87	228985	81.09
7.0	54	89	217160	71.04	228996	88.80
7.5	60	95	217171	73.37	229007	91.71
8.0	60	95	217182	77.59	229018	96.99
8.5	63	100	217193	95.80	229029	119.76
9.0	70	100	217204	108.77	229040	135.96
9.5	70	108	217215	124.11	229051	155.15
10.0	73	114	217226	142.51	229062	178.16
10.5	73	114	217237	159.40	229073	199.25
11.0	73	114	217248	189.66	229084	237.07
11.5	76	120	217259	195.34	229095	244.19
12.0	76	120	217270	216.80	229106	271.01

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

NOTE: SIZES 3.1mm AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE +.0000, -.0005

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

Solid Carbide Drills



JOBBER LENGTH - 118° SPLIT POINT - 25° HELIX



UNCOATED

ALUMINUM COATED

LETTER SIZES						LETTER SIZES							
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE	SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
A	2	3-1/4	139258	35.38	227665	44.22	N	2-3/8	3-3/4	139401	53.57	227808	66.95
B	2	3-1/4	139269	36.85	227676	46.06	O	2-3/8	3-3/4	139412	56.47	227819	70.59
C	2	3-1/4	139280	37.12	227687	46.40	P	2-3/8	3-3/4	139423	58.61	227830	73.26
D	2	3-1/4	139291	37.59	227698	46.98	Q	2-1/2	4	139434	60.76	227841	75.94
E	2	3-1/4	139302	36.85	227709	46.06	R	2-1/2	4	139445	63.41	227852	79.27
F	2	3-1/4	139313	40.98	227720	51.23	S	2-1/2	4	139456	67.56	227863	84.45
G	2-1/8	3-1/2	139324	43.47	227731	54.32	T	2-3/4	4-1/4	139467	69.98	227874	87.46
H	2-1/8	3-1/2	139335	44.41	227742	55.51	U	2-3/4	4-1/4	139478	73.44	227885	91.80
I	2-1/8	3-1/2	139346	45.12	227753	56.41	V	2-3/4	4-1/4	139489	81.33	227896	101.67
J	2-1/8	3-1/2	139357	46.34	227764	57.93	W	2-7/8	4-1/2	139500	87.60	227907	109.49
K	2-1/8	3-1/2	139368	46.72	227775	58.41	X	2-7/8	4-1/2	139511	95.59	227918	119.49
L	2-1/8	3-1/2	139379	49.40	227786	61.75	Y	2-7/8	4-1/2	139522	98.80	227929	123.50
M	2-3/8	3-3/4	139390	50.41	227797	63.00	Z	2-7/8	4-1/2	139533	107.07	227940	133.84

WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE	SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALUMINUM	LIST PRICE
1	1-3/4	3	139544	32.05	227951	40.07	31	1-1/4	2-1/4	139874	15.62	228281	19.54
2	1-3/4	3	139555	32.05	227962	40.07	32	1-1/4	2-1/4	139885	15.62	228292	19.54
3	1-3/4	3	139566	32.05	227973	40.07	33	1-1/4	2-1/4	139896	15.49	228303	19.35
4	1-3/4	3	139577	31.72	227984	39.64	34	1-1/4	2-1/4	139907	15.36	228314	19.20
5	1-3/4	3	139588	28.31	227995	35.40	35	1-1/4	2-1/4	139918	15.36	228325	19.20
6	1-3/4	3	139599	28.31	228006	35.40	36	1-1/4	2-1/4	139929	15.36	228336	19.20
7	1-3/4	3	139610	27.50	228017	34.38	37	1-1/4	2-1/4	139940	14.56	228347	18.19
8	1-3/4	3	139621	27.38	228028	34.22	38	1-1/4	2-1/4	139951	14.30	228358	17.87
9	1-3/4	3	139632	27.38	228039	34.22	39	1-1/4	2-1/4	139962	14.30	228369	17.87
10	1-5/8	2-3/4	139643	27.38	228050	34.22	40	1	2	139973	13.75	228380	17.19
11	1-5/8	2-3/4	139654	26.70	228061	33.38	41	1	2	139984	13.75	228391	17.19
12	1-5/8	2-3/4	139665	26.70	228072	33.38	42	1	2	139995	13.35	228402	16.69
13	1-5/8	2-3/4	139676	25.76	228083	32.21	43	1	2	140006	13.35	228413	16.69
14	1-5/8	2-3/4	139687	25.10	228094	31.37	44	1	2	140017	12.68	228424	15.86
15	1-5/8	2-3/4	139698	24.70	228105	30.88	45	7/8	1-3/4	140028	12.30	228435	15.37
16	1-5/8	2-3/4	139709	24.70	228116	30.88	46	7/8	1-3/4	140039	12.30	228446	15.37
17	1-5/8	2-3/4	139720	23.49	228127	29.37	47	7/8	1-3/4	140050	12.30	228457	15.37
18	1-5/8	2-3/4	139731	22.10	228138	27.62	48	7/8	1-3/4	140061	12.30	228468	15.37
19	1-5/8	2-3/4	139742	21.63	228149	27.04	49	7/8	1-3/4	140072	11.75	228479	14.69
20	1-3/8	2-1/2	139753	20.69	228160	25.86	50	7/8	1-3/4	140083	11.75	228490	14.69
21	1-3/8	2-1/2	139764	20.69	228171	25.86	51	3/4	1-1/2	140094	11.35	228501	14.19
22	1-3/8	2-1/2	139775	19.89	228182	24.86	52	3/4	1-1/2	140105	11.35	228512	14.19
23	1-3/8	2-1/2	139786	19.89	228193	24.86	53	3/4	1-1/2	140116	12.01	228523	15.01
24	1-3/8	2-1/2	139797	19.77	228204	24.70	54	3/4	1-1/2	140127	12.01	228534	15.01
25	1-3/8	2-1/2	139808	18.69	228215	23.37	55	3/4	1-1/2	140138	12.01	228545	15.01
26	1-3/8	2-1/2	139819	18.69	228226	23.37	56	3/4	1-1/2	140149	12.01	228556	15.01
27	1-3/8	2-1/2	139830	18.69	228237	23.37	57	3/4	1-1/2	140160	12.01	228567	15.01
28	1-3/8	2-1/2	139841	17.76	228248	22.19	58	3/4	1-1/2	140171	12.01	228578	15.01
29	1-3/8	2-1/2	139852	17.76	228259	22.19	59	3/4	1-1/2	140182	12.01	228589	15.01
30	1-1/4	2-1/4	139863	16.82	228270	21.03	60	3/4	1-1/2	140193	12.01	228600	15.01

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE +.0000, -.0005



Solid Carbide Drills

STUB LENGTH - 135° SPLIT POINT - 15° HELIX

UNCOATED



ALTIM COATED



FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
1/32	3/8	1-1/2	141469	12.77	217358	15.97
3/64	3/8	1-1/2	141480	12.77	217369	15.97
1/16	13/32	1-1/2	141491	12.04	217380	15.07
5/64	7/16	1-1/2	141502	12.77	217391	15.97
3/32	1/2	1-1/2	141513	14.06	217402	17.58
7/64	5/8	2	141524	15.96	217413	19.95
1/8	3/4	2	141535	17.03	217424	21.28
9/64	3/4	2	141546	18.87	217435	23.58
5/32	7/8	2	141557	21.15	217446	26.42
11/64	7/8	2	141568	24.97	217457	31.22
3/16	7/8	2	141579	25.67	217468	32.10
13/64	1-1/8	2-1/2	141590	29.65	217479	37.07
7/32	1-1/8	2-1/2	141601	32.91	217490	41.14
15/64	1-1/4	2-1/2	141612	37.24	217501	46.56
1/4	1-1/4	2-1/2	141623	39.15	217512	48.94
17/64	1-1/4	2-1/2	141634	44.11	217523	55.15

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
9/32	1-1/4	2-1/2	141645	45.96	217534	57.46
19/64	1-1/4	2-1/2	141656	51.63	217545	64.54
5/16	1-1/4	2-1/2	141667	54.36	217556	67.94
21/64	1-3/8	3	141678	59.29	217567	74.13
11/32	1-3/8	3	141689	64.83	217578	81.03
23/64	1-3/8	3	141700	72.48	217589	90.60
3/8	1-3/8	3	141711	76.87	217600	96.10
25/64	1-3/8	3	141722	90.03	217611	112.53
13/32	1-3/8	3	141733	98.61	217622	123.25
27/64	1-3/8	3	141744	107.26	217633	134.07
7/16	1-3/8	3	141755	112.19	217644	140.24
29/64	1-3/8	3	141766	130.17	217655	162.72
15/32	1-3/8	3	141777	135.62	217666	169.52
31/64	1-3/8	3	141788	139.45	217677	174.31
1/2	1-3/8	3	141799	139.74	217688	174.68
-	-	-	-	-	-	-

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

LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
A	1-1/4	2-1/2	141810	37.59	217699	46.99
B	1-1/4	2-1/2	141821	39.15	217710	48.94
C	1-1/4	2-1/2	141832	39.44	217721	49.30
D	1-1/4	2-1/2	141843	39.93	217732	49.91
E	1-1/4	2-1/2	141854	39.15	217743	48.94
F	1-1/4	2-1/2	141865	43.54	217754	54.43
G	1-1/4	2-1/2	141876	46.17	217765	57.71
H	1-1/4	2-1/2	141887	47.16	217776	58.96
I	1-1/4	2-1/2	141898	47.95	217787	59.93
J	1-1/4	2-1/2	141909	49.22	217798	61.53
K	1-1/4	2-1/2	141920	49.67	217809	62.08
L	1-1/4	2-1/2	141931	52.50	217820	65.61
M	1-1/4	2-1/2	141942	53.56	217831	66.95

LETTER SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIM	LIST PRICE
N	1-1/4	2-1/2	141953	56.91	217842	71.13
O	1-3/8	3	141964	59.99	217853	75.00
P	1-3/8	3	141975	62.29	217864	77.85
Q	1-3/8	3	141986	64.54	217875	80.68
R	1-3/8	3	141997	67.39	217886	84.23
S	1-3/8	3	142008	71.78	217897	89.73
T	1-3/8	3	142019	74.36	217908	92.95
U	1-3/8	3	142030	78.03	217919	97.53
V	1-3/8	3	142041	86.42	217930	108.01
W	1-3/8	3	142052	93.06	217941	116.33
X	1-3/8	3	142063	101.57	217952	126.97
Y	1-3/8	3	142074	104.97	217963	131.22
Z	1-3/8	3	142085	113.78	217974	142.20

DIAMETER TOLERANCE +.0000, -.0005

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

Solid Carbide Drills



STUB LENGTH - 135° SPLIT POINT - 15° HELIX



UNCOATED



ALTiN COATED

WIRE SIZES						WIRE SIZES							
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE	SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1	1-1/4	2-1/2	142096	34.05	217985	42.58	31	3/4	2	142426	16.60	218315	20.76
2	1-1/4	2-1/2	142107	34.05	217996	42.58	32	3/4	2	142437	16.60	218326	20.76
3	1-1/8	2-1/2	142118	34.05	218007	42.58	33	3/4	2	142448	16.45	218337	20.57
4	1-1/8	2-1/2	142129	33.68	218018	42.12	34	3/4	2	142459	16.31	218348	20.39
5	1-1/8	2-1/2	142140	30.07	218029	37.59	35	3/4	2	142470	16.31	218359	20.39
6	1-1/8	2-1/2	142151	30.07	218040	37.59	36	5/8	2	142481	16.31	218370	20.39
7	1-1/8	2-1/2	142162	29.21	218051	36.52	37	5/8	2	142492	15.47	218381	19.33
8	1-1/8	2-1/2	142173	29.09	218062	36.36	38	5/8	2	142503	15.18	218392	18.97
9	1-1/8	2-1/2	142184	29.09	218073	36.36	39	5/8	2	142514	15.18	218403	18.97
10	1-1/8	2-1/2	142195	29.09	218084	36.36	40	5/8	2	142525	14.62	218414	18.27
11	1-1/8	2-1/2	142206	28.36	218095	35.45	41	5/8	2	142536	14.62	218425	18.27
12	1-1/8	2-1/2	142217	28.36	218106	35.45	42	1/2	1-1/2	142547	14.20	218436	17.75
13	7/8	2	142228	27.36	218117	34.21	43	1/2	1-1/2	142558	14.20	218447	17.75
14	7/8	2	142239	26.68	218128	33.36	44	1/2	1-1/2	142569	13.47	218458	16.84
15	7/8	2	142250	26.25	218139	32.81	45	1/2	1-1/2	142580	13.04	218469	16.30
16	7/8	2	142261	26.25	218150	32.81	46	1/2	1-1/2	142591	13.04	218480	16.30
17	7/8	2	142272	24.97	218161	31.21	47	1/2	1-1/2	142602	13.04	218491	16.30
18	7/8	2	142283	23.47	218172	29.34	48	7/16	1-1/2	142613	13.04	218502	16.30
19	7/8	2	142294	23.00	218183	28.74	49	7/16	1-1/2	142624	12.48	218513	15.60
20	7/8	2	142305	22.00	218194	27.50	50	7/16	1-1/2	142635	12.48	218524	15.60
21	7/8	2	142316	22.00	218205	27.50	51	7/16	1-1/2	142646	12.04	218535	15.07
22	7/8	2	142327	21.15	218216	26.42	52	7/16	1-1/2	142657	12.04	218546	15.07
23	7/8	2	142338	21.15	218227	26.42	53	13/32	1-1/2	142668	12.77	218557	15.97
24	7/8	2	142349	21.00	218238	26.25	54	13/32	1-1/2	142679	12.77	218568	15.97
25	7/8	2	142360	19.87	218249	24.83	55	13/32	1-1/2	142690	12.77	218579	15.97
26	7/8	2	142371	19.87	218260	24.83	56	3/8	1-1/2	142701	12.77	218590	15.97
27	7/8	2	142382	19.87	218271	24.83	57	3/8	1-1/2	142712	12.77	218601	15.97
28	3/4	2	142393	18.87	218282	23.58	58	3/8	1-1/2	142723	12.77	218612	15.97
29	3/4	2	142404	18.87	218293	23.58	59	3/8	1-1/2	142734	12.77	218623	15.97
30	3/4	2	142415	17.87	218304	22.33	60	3/8	1-1/2	142745	12.77	218634	15.97

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE +.0000, -.0005



Solid Carbide Drills

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	15.25	229117	19.07
3/64	3/8	1-1/2	140215	15.25	229128	19.07
1/16	13/32	1-1/2	140226	15.70	229139	19.61
5/64	7/16	1-1/2	140237	16.39	229150	20.50
3/32	1/2	1-1/2	140248	18.07	229161	22.59
7/64	5/8	2	140259	19.70	229172	24.61
1/8	3/4	2	140270	18.68	229183	23.35
9/64	3/4	2	140281	21.36	229194	26.70
5/32	7/8	2	140292	23.92	229205	29.91
11/64	7/8	2	140303	26.54	229216	33.18
3/16	7/8	2	140314	24.51	229227	30.63
13/64	1-1/8	2-1/2	140325	31.88	229238	39.87
7/32	1-1/8	2-1/2	140336	35.81	229249	44.76
15/64	1-1/4	2-1/2	140347	37.79	229260	47.23
1/4	1-1/4	2-1/2	140358	35.74	229271	44.69

FRACTIONAL SIZES						
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
17/64	1-1/4	2-1/2	140369	49.69	229282	62.10
9/32	1-1/4	2-1/2	140380	51.65	229293	64.58
19/64	1-1/4	2-1/2	140391	54.67	229304	68.36
5/16	1-1/4	2-1/2	140402	56.63	229315	70.79
21/64	1-3/8	3	140413	60.87	229326	76.08
11/32	1-3/8	3	140424	67.52	229337	84.39
23/64	1-3/8	3	140435	73.88	229348	92.34
3/8	1-3/8	3	140446	73.25	229359	91.56
25/64	1-3/8	3	140457	90.58	229370	113.24
13/32	1-3/8	3	140468	86.69	229381	108.36
27/64	1-3/8	3	140479	109.91	229392	137.38
7/16	1-3/8	3	140490	107.22	229403	134.02
15/32	1-3/8	3	140501	119.29	229414	149.11
1/2	1-3/8	3	140512	129.27	229425	161.57
-	-	-	-	-	-	-

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	37.79	229436	47.23
B	1-1/4	2-1/2	140534	37.79	229447	47.23
C	1-1/4	2-1/2	140545	37.79	229458	47.23
D	1-1/4	2-1/2	140556	37.79	229469	47.23
E	1-1/4	2-1/2	140567	35.74	229480	44.69
F	1-1/4	2-1/2	140578	49.69	229491	62.10
G	1-1/4	2-1/2	140589	49.69	229502	62.10
H	1-1/4	2-1/2	140600	49.69	229513	62.10
I	1-1/4	2-1/2	140611	51.65	229524	64.58
J	1-1/4	2-1/2	140622	51.65	229535	64.58
K	1-1/4	2-1/2	140633	51.65	229546	64.58
L	1-1/4	2-1/2	140644	54.67	229557	68.36
M	1-1/4	2-1/2	140655	54.67	229568	68.36

LETTER SIZES						
SIZE	FLUTE LENGTH	OVERALL LENGTH	UNCOATED	LIST PRICE	ALTIN	LIST PRICE
N	1-1/4	2-1/2	140666	56.63	229579	70.79
O	1-3/8	3	140677	56.63	229590	70.79
P	1-3/8	3	140688	60.88	229601	76.09
Q	1-3/8	3	140699	67.52	229612	84.39
R	1-3/8	3	140710	67.52	229623	84.39
S	1-3/8	3	140721	73.88	229634	92.34
T	1-3/8	3	140732	73.88	229645	92.34
U	1-3/8	3	140743	81.92	229656	102.41
V	1-3/8	3	140754	81.92	229667	102.41
W	1-3/8	3	140765	90.58	229678	113.24
X	1-3/8	3	140776	100.24	229689	125.32
Y	1-3/8	3	140787	105.07	229700	131.34
Z	1-3/8	3	140798	109.91	229711	137.38

DIAMETER TOLERANCE +.0000, -.0005

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

Solid Carbide Drills



STRAIGHT FLUTE - 140° SPLIT POINT



UNCOATED

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	36.76	229722	45.96	31	3/4	2	141139	21.01	230052	26.28
2	1-1/4	2-1/2	140820	36.11	229733	45.13	32	3/4	2	141150	20.84	230063	26.05
3	1-1/8	2-1/2	140831	34.66	229744	43.33	33	3/4	2	141161	20.30	230074	25.38
4	1-1/8	2-1/2	140842	32.74	229755	40.93	34	3/4	2	141172	20.21	230085	25.26
5	1-1/8	2-1/2	140853	33.11	229766	41.39	35	3/4	2	141183	19.70	230096	24.61
6	1-1/8	2-1/2	140864	32.63	229777	40.77	36	5/8	2	141194	19.50	230107	24.38
7	1-1/8	2-1/2	140875	31.42	229788	39.28	37	5/8	2	141205	19.50	230118	24.38
8	1-1/8	2-1/2	140886	30.95	229799	38.69	38	5/8	2	141216	19.30	230129	24.11
9	1-1/8	2-1/2	140897	30.02	229810	37.52	39	5/8	2	141227	18.53	230140	23.17
10	1-1/8	2-1/2	140908	29.57	229821	36.98	40	5/8	2	141238	18.53	230151	23.17
11	1-1/8	2-1/2	140919	29.05	229832	36.32	41	5/8	2	141249	18.54	230162	23.17
12	1-1/8	2-1/2	140930	28.52	229843	35.65	42	1/2	1-1/2	141260	17.85	230173	22.31
13	7/8	2	140941	28.05	229854	35.05	43	1/2	1-1/2	141271	17.56	230184	21.93
14	7/8	2	140952	27.86	229865	34.83	44	1/2	1-1/2	141282	17.31	230195	21.64
15	7/8	2	140963	27.58	229876	34.48	45	1/2	1-1/2	141293	16.93	230206	21.16
16	7/8	2	140974	27.49	229887	34.36	46	1/2	1-1/2	141304	16.39	230217	20.50
17	7/8	2	140985	26.83	229898	33.55	47	1/2	1-1/2	141315	16.39	230228	20.50
18	7/8	2	140996	26.06	229909	32.58	48	7/16	1-1/2	141326	16.39	230239	20.50
19	7/8	2	141007	25.90	229920	32.37	49	7/16	1-1/2	141337	15.99	230250	19.99
20	7/8	2	141018	25.01	229931	31.28	50	7/16	1-1/2	141348	15.79	230261	19.74
21	7/8	2	141029	24.85	229942	31.07	51	7/16	1-1/2	141359	15.70	230272	19.61
22	7/8	2	141040	24.38	229953	30.47	52	7/16	1-1/2	141370	15.70	230283	19.61
23	7/8	2	141051	23.34	229964	29.18	53	13/32	1-1/2	141381	15.49	230294	19.36
24	7/8	2	141062	22.70	229975	28.38	54	13/32	1-1/2	141392	15.49	230305	19.36
25	7/8	2	141073	22.03	229986	27.53	55	13/32	1-1/2	141403	15.25	230316	19.07
26	7/8	2	141084	21.77	229997	27.21	56	3/8	1-1/2	141414	15.25	230327	19.07
27	7/8	2	141095	21.35	230008	26.69	57	3/8	1-1/2	141425	15.25	230338	19.07
28	3/4	2	141106	20.62	230019	25.77	58	3/8	1-1/2	141436	15.25	230349	19.07
29	3/4	2	141117	20.17	230030	25.22	59	3/8	1-1/2	141447	15.25	230360	19.07
30	3/4	2	141128	19.88	230041	24.85	60	3/8	1-1/2	141458	15.25	230371	19.07

NOTE: SIZES 31 AND UNDER ARE NOT SPLIT.

DIAMETER TOLERANCE +.0000, -.0005



Solid Carbide Reamers



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

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0400	N60	.0400	1/4	1-1/2	4	157353	30.06
.0410	N59	.0410	3/8	1-1/2	4	157364	30.06
.0420	N58	.0420	3/8	1-1/2	4	157375	30.06
.0430	N57	.0430	3/8	1-1/2	4	157386	30.06
.0440		.0440	3/8	1-1/2	4	157397	31.75
.0450		.0450	3/8	1-1/2	4	157408	31.75
.0460		.0460	3/8	1-1/2	4	157419	31.75
.0465	N56	.0465	3/8	1-1/2	4	157430	30.06
.0469	3/64	.0469	3/8	1-1/2	4	157441	28.56
.0470		.0470	3/8	1-1/2	4	157452	31.75
.0480		.0480	3/8	1-1/2	4	157463	31.75
.0490		.0490	3/8	1-1/2	4	157474	31.75
.0500		.0500	3/8	1-1/2	4	157485	31.75
.0510		.0510	3/8	1-1/2	4	157496	31.75
.0520	N55	.0520	3/8	1-1/2	4	157507	30.07
.0530		.0530	3/8	1-1/2	4	157518	31.75
.0540		.0540	3/8	1-1/2	4	157529	31.75
.0550	N54	.0550	3/8	1-1/2	4	157540	30.07
.0560		.0560	3/8	1-1/2	4	157551	31.75
.0570		.0570	3/8	1-1/2	4	157562	31.75
.0580		.0580	3/8	1-1/2	4	157573	31.75
.0590		.0590	3/8	1-1/2	4	157584	31.75
.0591	1.5mm	.0591	3/8	1-1/2	4	157595	31.75
.0595	N53	.0595	3/8	1-1/2	4	157606	30.07
.0600		.0600	3/8	1-1/2	4	157617	31.75
.0605		.0605	3/8	1-1/2	4	157628	42.23
.0610		.0610	3/8	1-1/2	4	157639	31.75
.0615		.0615	3/8	1-1/2	4	157650	35.12
.0620		.0620	3/8	1-1/2	4	157661	31.75
.0625	1/16	.0625	3/8	1-1/2	4	157672	28.56
.0630		.0630	3/8	1-1/2	4	157683	31.75
.0635	N52	.0635	3/8	1-1/2	4	157694	30.06
.0640		.0640	3/8	1-1/2	4	157705	31.75
.0645		.0645	3/8	1-1/2	4	157716	42.23
.0650		.0650	3/8	1-1/2	4	157727	31.75
.0660		.0660	1/2	1-3/4	4	157738	31.75
.0670	N51	.0670	1/2	1-3/4	4	157749	30.06
.0680		.0680	1/2	1-3/4	4	157760	31.75
.0690		.0690	1/2	1-3/4	4	157771	31.75
.0700	N50	.0700	1/2	1-3/4	4	157782	30.06
.0710		.0710	1/2	1-3/4	4	157793	31.75
.0720		.0720	1/2	1-3/4	4	157804	31.75
.0730	N49	.0730	1/2	1-3/4	4	157815	30.06
.0740		.0740	1/2	1-3/4	4	157826	31.75
.0750		.0750	1/2	1-3/4	4	157837	31.75
.0760	N48	.0760	1/2	1-3/4	4	157848	30.06
.0770		.0770	1/2	1-3/4	4	157859	31.75
.0780		.0780	1/2	1-3/4	4	157870	31.75
.0781	5/64	.0781	1/2	1-3/4	4	157881	28.56
.0785	N47	.0785	1/2	1-3/4	4	157892	30.06
.0787	2mm	.0787	1/2	1-3/4	4	157903	31.75
.0790		.0790	1/2	1-3/4	4	157914	31.75
.0800		.0800	1/2	1-3/4	4	157925	31.75
.0810	N46	.0810	1/2	2	4	157936	30.06
.0820	N45	.0820	1/2	2	4	157947	30.06
.0830		.0830	1/2	2	4	157958	31.75

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.0840		.0840	1/2	2	4	157969	31.75
.0850		.0850	1/2	2	4	157980	31.75
.0860	N44	.0860	1/2	2	4	157991	30.06
.0870		.0870	1/2	2	4	158002	31.75
.0880		.0880	1/2	2	4	158013	31.75
.0890	N43	.0890	1/2	2	4	158024	30.06
.0900		.0900	1/2	2	4	158035	31.75
.0910		.0910	1/2	2	4	158046	31.75
.0915		.0915	1/2	2	4	158057	41.89
.0920		.0920	1/2	2	4	158068	31.75
.0925		.0925	1/2	2	4	158079	35.12
.0930		.0930	1/2	2	4	158090	31.75
.0935	N42	.0935	1/2	2	4	158101	30.06
.0938	3/32	.0938	1/2	2	4	158112	28.56
.0940		.0940	1/2	2	4	158123	31.75
.0945		.0945	1/2	2	4	158134	35.12
.0950		.0950	1/2	2	4	158145	31.75
.0960	N41	.0960	5/8	2	4	158156	30.06
.0970		.0970	5/8	2	4	158167	31.75
.0980	N40	.0980	5/8	2	4	158178	30.06
.0984	2.5mm	.0984	5/8	2	4	158189	31.75
.0990		.0990	5/8	2-1/4	4	158200	31.75
.0995	N39	.0995	5/8	2-1/4	4	158211	30.06
.1000		.1000	5/8	2-1/4	4	158222	31.75
.1010		.1010	5/8	2-1/4	4	158233	31.75
.1015	N38	.1015	5/8	2-1/4	4	158244	30.06
.1020		.1020	5/8	2-1/4	4	158255	31.75
.1030		.1030	5/8	2-1/4	4	158266	31.75
.1040	N37	.1040	5/8	2-1/4	4	158277	30.06
.1050		.1050	5/8	2-1/4	4	158288	31.75
.1060		.1060	5/8	2-1/4	4	158299	31.75
.1065	N36	.1065	5/8	2-1/4	4	158310	30.06
.1070		.1070	5/8	2-1/4	4	158321	31.75
.1080		.1080	5/8	2-1/4	4	158332	31.75
.1090		.1090	5/8	2-1/4	4	158343	33.10
.1094	7/64	.1094	5/8	2-1/4	4	158354	28.56
.1100	N35	.1100	5/8	2-1/4	4	158365	30.06
.1110	N34	.1110	5/8	2-1/4	4	158376	30.06
.1120		.1120	5/8	2-1/4	4	158387	31.75
.1130	N33	.1130	5/8	2-1/4	4	158398	30.06
.1140		.1140	5/8	2-1/4	4	158409	31.75
.1150		.1150	5/8	2-1/4	4	158420	31.75
.1160	N32	.1160	5/8	2-1/4	4	158431	31.61
.1170		.1170	5/8	2-1/4	4	158442	33.62
.1180		.1180	5/8	2-1/4	4	158453	33.62
.1181	3mm	.1181	5/8	2-1/4	4	158464	30.92
.1190		.1190	5/8	2-1/4	4	158475	33.62
.1200	N31	.1200	5/8	2-1/4	4	158486	31.61
.1210		.1210	5/8	2-1/4	4	158497	33.62
.1220		.1220	5/8	2-1/4	4	158508	33.62
.1230		.1230	5/8	2-1/4	4	158519	33.62
.1235		.1235	5/8	2-1/4	4	158530	44.77
.1240		.1240	5/8	2-1/4	4	158541	33.62
.1245		.1245	5/8	2-1/4	4	158552	37.15
.1250	1/8	.1250	5/8	2-1/4	4	158563	30.40
.1255		.1255	5/8	2-1/4	4	158574	37.15

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

Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1260		.1260	5/8	2-1/4	4	158585	33.62
.1265		.1265	5/8	2-1/4	4	158596	44.77
.1270		.1270	5/8	2-1/4	4	158607	33.62
.1275		.1275	5/8	2-1/4	4	158618	44.77
.1280		.1280	5/8	2-1/4	4	158629	33.62
.1285	N30	.1285	5/8	2-1/4	4	158640	33.62
.1290		.1290	5/8	2-1/4	4	158651	33.62
.1300		.1300	5/8	2-1/2	4	158662	33.62
.1310		.1310	3/4	2-1/2	4	158673	38.50
.1320		.1320	3/4	2-1/2	4	158684	38.50
.1330		.1330	3/4	2-1/2	4	158695	38.50
.1340		.1340	3/4	2-1/2	4	158706	38.50
.1350		.1350	3/4	2-1/2	4	158717	38.50
.1360	N29	.1360	3/4	2-1/2	4	158728	35.99
.1370		.1370	3/4	2-1/2	4	158739	38.50
.1378	3.5mm	.1378	3/4	2-1/2	4	158750	38.50
.1380		.1380	3/4	2-1/2	4	158761	38.50
.1390		.1390	3/4	2-1/2	4	158772	38.50
.1400		.1400	3/4	2-1/2	4	158783	38.50
.1405	N28	.1405	3/4	2-1/2	4	158794	35.99
.1406	9/64	.1406	3/4	2-1/2	4	158805	34.64
.1410		.1410	3/4	2-1/2	4	158816	38.50
.1420		.1420	3/4	2-1/2	4	158827	38.50
.1430		.1430	3/4	2-1/2	4	158838	38.50
.1440	N27	.1440	3/4	2-1/2	4	158849	35.99
.1450		.1450	3/4	2-1/2	4	158860	38.50
.1460		.1460	3/4	2-1/2	4	158871	40.20
.1470	N26	.1470	3/4	2-1/2	4	158882	37.49
.1480		.1480	3/4	2-1/2	4	158893	40.20
.1490		.1490	3/4	2-1/2	4	158904	40.20
.1495	N25	.1495	3/4	2-1/2	4	158915	37.49
.1500		.1500	3/4	2-1/2	4	158926	40.20
.1510		.1510	3/4	2-1/2	4	158937	40.20
.1520	N24	.1520	3/4	2-1/2	4	158948	37.49
.1530		.1530	3/4	2-1/2	4	158959	40.20
.1540	N23	.1540	3/4	2-1/2	4	158970	37.49
.1545		.1545	3/4	2-1/2	4	158981	46.46
.1550		.1550	3/4	2-1/2	4	158992	40.20
.1555		.1555	3/4	2-1/2	4	159003	46.46
.1560		.1560	3/4	2-1/2	4	159014	40.20
.1562	5/32	.1562	3/4	2-1/2	4	159025	36.33
.1565		.1565	3/4	2-1/2	4	159036	46.46
.1570	N22	.1570	3/4	2-1/2	4	159047	37.49
.1575	4mm	.1575	3/4	2-1/2	4	159058	40.20
.1580		.1580	3/4	2-1/2	4	159069	40.20
.1590	N21	.1590	3/4	2-1/2	4	159080	37.49
.1600		.1600	3/4	2-1/2	4	159091	40.20
.1610	N20	.1610	7/8	2-1/2	4	159102	42.23
.1620		.1620	7/8	2-3/4	4	159113	45.26
.1630		.1630	7/8	2-3/4	4	159124	45.26
.1640		.1640	7/8	2-3/4	4	159135	45.26
.1650		.1650	7/8	2-3/4	4	159146	42.23
.1660	N19	.1660	7/8	2-3/4	4	159157	42.23
.1670		.1670	7/8	2-3/4	4	159168	45.26
.1680		.1680	7/8	2-3/4	4	159179	45.26
.1690		.1690	7/8	2-3/4	4	159190	45.26

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.1695	N18	.1695	7/8	2-3/4	4	159201	42.23
.1700		.1700	7/8	2-3/4	4	159212	45.26
.1710		.1710	7/8	2-3/4	4	159223	45.26
.1719	11/64	.1719	7/8	2-3/4	4	159234	40.71
.1720		.1720	7/8	2-3/4	4	159245	45.26
.1730	N17	.1730	7/8	2-3/4	4	159256	42.23
.1740		.1740	7/8	2-3/4	4	159267	45.26
.1750		.1750	7/8	2-3/4	4	159278	45.26
.1760		.1760	7/8	2-3/4	4	159289	45.26
.1770	N16	.1770	7/8	2-3/4	4	159300	42.23
.1772	4.5mm	.1772	7/8	2-3/4	4	159311	47.13
.1780		.1780	7/8	2-3/4	4	159322	45.26
.1790		.1790	7/8	2-3/4	4	159333	45.26
.1800	N15	.1800	7/8	2-3/4	4	159344	42.23
.1810		.1810	7/8	2-3/4	4	159355	45.26
.1820	N14	.1820	7/8	2-3/4	4	159366	42.23
.1830		.1830	7/8	2-3/4	4	159377	45.26
.1840		.1840	7/8	2-3/4	4	159388	45.26
.1850	N13	.1850	7/8	2-3/4	4	159399	42.23
.1855		.1855	7/8	2-3/4	4	159410	54.38
.1860		.1860	7/8	2-3/4	4	159421	45.26
.1865		.1865	7/8	2-3/4	4	159432	48.64
.1870		.1870	7/8	2-3/4	4	159443	45.26
.1875	3/16	.1875	7/8	2-3/4	4	159454	40.71
.1880		.1880	7/8	2-3/4	4	159465	45.26
.1885		.1885	7/8	2-3/4	4	159476	48.64
.1890	N12	.1890	7/8	2-3/4	4	159487	42.23
.1900		.1900	7/8	2-3/4	4	159498	45.26
.1910	N11	.1910	7/8	2-3/4	4	159509	51.35
.1920		.1920	7/8	2-3/4	4	159520	54.90
.1930		.1930	7/8	2-3/4	4	159531	54.90
.1935	N10	.1935	7/8	2-3/4	4	159542	51.34
.1940		.1940	7/8	2-3/4	4	159553	54.90
.1950		.1950	7/8	2-3/4	4	159564	54.90
.1960	N9	.1960	1	3	4	159575	51.34
.1969	5mm	.1969	1	3	4	159586	54.90
.1970		.1970	1	3	4	159597	54.90
.1980		.1980	1	3	4	159608	54.90
.1990	N8	.1990	1	3	4	159619	51.34
.2000		.2000	1	3	4	159630	54.90
.2010	N7	.2010	1	3	4	159641	51.34
.2020		.2020	1	3	4	159652	54.90
.2030		.2030	1	3	4	159663	54.90
.2031	13/64	.2031	1	3	4	159674	49.31
.2040	N6	.2040	1	3	4	159685	51.34
.2050		.2050	1	3	4	159696	54.90
.2055	N5	.2055	1	3	4	159707	51.34
.2060		.2060	1	3	4	159718	54.90
.2070		.2070	1	3	4	159729	54.90
.2080		.2080	1	3	4	159740	54.90
.2090	N4	.2090	1	3	4	159751	51.34
.2100		.2100	1	3	4	159762	54.90
.2110		.2110	1	3	4	159773	54.90
.2120		.2120	1	3	4	159784	54.90
.2130	N3	.2130	1	3	4	159795	51.34
.2140		.2140	1	3	4	159806	54.90

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



Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2150		.2150	1	3	4	159817	54.90
.2160		.2160	1	3	4	159828	54.90
.2165	5.5mm	.2165	1	3	4	159839	57.95
.2170		.2170	1	3	4	159850	54.90
.2180		.2180	1	3	4	159861	54.90
.2188	7/32	.2188	1	3	4	159872	49.31
.2190		.2190	1	3	4	159883	54.90
.2200		.2200	1	3	4	159894	54.90
.2210	N2	.2210	1	3	4	159905	51.34
.2220		.2220	1	3	4	159916	54.90
.2230		.2230	1	3	4	159927	54.90
.2240		.2240	1	3	4	159938	54.90
.2250		.2250	1	3	4	159949	54.90
.2260		.2260	1	3	4	159960	60.31
.2270		.2270	1	3	4	159971	60.31
.2280	N1	.2280	1	3	4	159982	56.25
.2290		.2290	1	3	4	159993	56.25
.2300		.2300	1	3	4	160004	60.31
.2310		.2310	1	3	4	160015	60.31
.2320		.2320	1	3	4	160026	60.31
.2330		.2330	1	3	4	160037	60.31
.2340	A	.2340	1	3	4	160048	60.31
.2344	15/64	.2344	1	3	4	160059	54.23
.2350		.2350	1	3	4	160070	60.31
.2360		.2360	1	3	4	160081	60.31
.2362	6mm	.2362	1	3	4	160092	57.41
.2370		.2370	1	3	4	160103	60.31
.2380	B	.2380	1	3	4	160114	60.31
.2390		.2390	1	3	4	160125	60.31
.2400		.2400	1	3	4	160136	60.31
.2410		.2410	1	3	4	160147	60.31
.2420	C	.2420	1	3	4	160158	60.31
.2430		.2430	1	3	4	160169	60.31
.2440		.2440	1	3	4	160180	60.31
.2450		.2450	1	3	4	160191	60.31
.2460	D	.2460	1	3	4	160202	60.31
.2470		.2470	1	3	4	160213	60.31
.2480		.2480	1	3	4	160224	60.31
.2485		.2485	1	3	4	160235	67.40
.2490		.2490	1	3	4	160246	60.31
.2495		.2495	1	3	4	160257	64.02
.2500	1/4	.2500	1	3	4	160268	54.23
.2505		.2505	1	3	4	160279	64.02
.2510		.2510	1	3	4	160290	60.31
.2515		.2515	1	3	4	160301	74.99
.2520		.2520	1	3	4	160312	60.31
.2530		.2530	1	3	4	160323	60.31
.2540		.2540	1	3	4	160334	60.31
.2550		.2550	1	3	6	160345	60.31
.2559	6.5mm	.2559	1-1/8	3-1/4	6	160356	63.85
.2560		.2560	1-1/8	3-1/4	6	160367	72.96
.2570	F	.2570	1-1/8	3-1/4	6	160378	72.96
.2580		.2580	1-1/8	3-1/4	6	160389	72.96
.2590		.2590	1-1/8	3-1/4	6	160400	72.96
.2600		.2600	1-1/8	3-1/4	6	160411	72.96
.2610	G	.2610	1-1/8	3-1/4	6	160422	72.96

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.2620		.2620	1-1/8	3-1/4	6	160433	72.96
.2630		.2630	1-1/8	3-1/4	6	160444	72.96
.2640		.2640	1-1/8	3-1/4	6	160455	72.96
.2650		.2650	1-1/8	3-1/4	6	160466	72.96
.2656	17/64	.2656	1-1/8	3-1/4	6	160477	65.71
.2660	H	.2660	1-1/8	3-1/4	6	160488	72.96
.2670		.2670	1-1/8	3-1/4	6	160499	72.96
.2680		.2680	1-1/8	3-1/4	6	160510	72.96
.2690		.2690	1-1/8	3-1/4	6	160521	72.96
.2700		.2700	1-1/8	3-1/4	6	160532	72.96
.2710		.2710	1-1/8	3-1/4	6	160543	72.96
.2720	I	.2720	1-1/8	3-1/4	6	160554	72.96
.2730		.2730	1-1/8	3-1/4	6	160565	72.96
.2740		.2740	1-1/8	3-1/4	6	160576	72.96
.2750		.2750	1-1/8	3-1/4	6	160587	72.96
.2756	7mm	.2756	1-1/8	3-1/4	6	160598	79.71
.2760		.2760	1-1/8	3-1/4	6	160609	72.96
.2770	J	.2770	1-1/8	3-1/4	6	160620	72.96
.2780		.2780	1-1/8	3-1/4	6	160631	72.96
.2790		.2790	1-1/8	3-1/4	6	160642	72.96
.2800		.2800	1-1/8	3-1/4	6	160653	72.96
.2810	K	.2810	1-1/8	3-1/4	6	160664	72.96
.2812	9/32	.2812	1-1/8	3-1/4	6	160675	65.71
.2820		.2820	1-1/8	3-1/4	6	160686	72.96
.2830		.2830	1-1/8	3-1/4	6	160697	72.96
.2840		.2840	1-1/8	3-1/4	6	160708	72.96
.2850		.2850	1-1/8	3-1/4	6	160719	72.96
.2860		.2860	1-1/8	3-1/4	6	160730	72.96
.2870		.2870	1-1/8	3-1/4	6	160741	72.96
.2880		.2880	1-1/8	3-1/4	6	160752	72.96
.2890		.2890	1-1/8	3-1/4	6	160763	72.96
.2900	L	.2900	1-1/8	3-1/4	6	160774	72.96
.2910		.2910	1-1/8	3-1/4	6	160785	72.96
.2920		.2920	1-1/8	3-1/4	6	160796	72.96
.2930		.2930	1-1/8	3-1/4	6	160807	72.96
.2940		.2940	1-1/8	3-1/4	6	160818	72.96
.2950	M	.2950	1-1/8	3-1/4	6	160829	72.96
.2953	7.5mm	.2953	1-1/8	3-1/4	6	160840	79.71
.2960		.2960	1-1/8	3-1/4	6	160851	72.96
.2969	19/64	.2969	1-1/8	3-1/4	6	160862	72.96
.2970		.2970	1-1/8	3-1/4	6	160873	72.96
.2980		.2980	1-1/8	3-1/4	6	160884	72.96
.2990		.2990	1-1/8	3-1/4	6	160895	72.96
.3000		.3000	1-1/8	3-1/4	6	160906	72.96
.3010		.3010	1-1/8	3-1/4	6	160917	72.96
.3020	N	.3020	1-1/8	3-1/4	6	160928	72.96
.3030		.3030	1-1/8	3-1/4	6	160939	72.96
.3040		.3040	1-1/8	3-1/4	6	160950	72.96
.3050		.3050	1-1/8	3-1/4	6	160961	72.96
.3060		.3060	1-1/8	3-1/4	6	160972	72.96
.3070		.3070	1-1/8	3-1/4	6	160983	72.96
.3080		.3080	1-1/8	3-1/4	6	160994	72.96
.3090		.3090	1-1/8	3-1/4	6	161005	72.96
.3100		.3100	1-1/8	3-1/4	6	161016	72.96
.3110		.3110	1-1/8	3-1/4	6	161027	72.96
.3115		.3115	1-1/8	3-1/4	6	161038	83.76

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

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

Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3120		.3120	1-1/8	3-1/4	6	161049	72.96
.3125	5/16	.3125	1-1/8	3-1/4	6	161060	72.96
.3130		.3130	1-1/8	3-1/4	6	161071	72.96
.3135		.3135	1-1/8	3-1/4	6	161082	83.76
.3140		.3140	1-1/8	3-1/4	6	161093	72.96
.3150	8mm	.3150	1-1/8	3-1/4	6	161104	72.96
.3160	O	.3160	1-1/8	3-1/4	6	161115	81.58
.3170		.3170	1-1/8	3-1/4	6	161126	81.58
.3180		.3180	1-1/8	3-1/4	6	161137	81.58
.3190		.3190	1-1/8	3-1/4	6	161148	81.58
.3200		.3200	1-1/8	3-1/4	6	161159	81.58
.3210		.3210	1-1/4	3-1/2	6	161170	81.58
.3220		.3220	1-1/4	3-1/2	6	161181	81.58
.3230	P	.3230	1-1/4	3-1/2	6	161192	81.58
.3240		.3240	1-1/4	3-1/2	6	161203	81.58
.3250		.3250	1-1/4	3-1/2	6	161214	81.58
.3260		.3260	1-1/4	3-1/2	6	161225	81.58
.3270		.3270	1-1/4	3-1/2	6	161236	81.58
.3280		.3280	1-1/4	3-1/2	6	161247	81.58
.3281	21/64	.3281	1-1/4	3-1/2	6	161258	82.41
.3290		.3290	1-1/4	3-1/2	6	161269	81.58
.3300		.3300	1-1/4	3-1/2	6	161280	81.58
.3310		.3310	1-1/4	3-1/2	6	161291	81.58
.3320	Q	.3320	1-1/4	3-1/2	6	161302	81.58
.3330		.3330	1-1/4	3-1/2	6	161313	81.58
.3340		.3340	1-1/4	3-1/2	6	161324	81.58
.3346	8.5mm	.3346	1-1/4	3-1/2	6	161335	81.58
.3350		.3350	1-1/4	3-1/2	6	161346	81.58
.3360		.3360	1-1/4	3-1/2	6	161357	81.58
.3370		.3370	1-1/4	3-1/2	6	161368	81.58
.3380		.3380	1-1/4	3-1/2	6	161379	81.58
.3390	R	.3390	1-1/4	3-1/2	6	161390	82.13
.3400		.3400	1-1/4	3-1/2	6	161401	81.58
.3410		.3410	1-1/4	3-1/2	6	161412	81.58
.3420		.3420	1-1/4	3-1/2	6	161423	81.58
.3430		.3430	1-1/4	3-1/2	6	161434	81.58
.3438	11/32	.3438	1-1/4	3-1/2	6	161445	82.41
.3440		.3440	1-1/4	3-1/2	6	161456	81.58
.3450		.3450	1-1/4	3-1/2	6	161467	81.58
.3460		.3460	1-1/4	3-1/2	6	161478	81.58
.3470		.3470	1-1/4	3-1/2	6	161489	81.58
.3480	S	.3480	1-1/4	3-1/2	6	161500	81.58
.3490		.3490	1-1/4	3-1/2	6	161511	81.58
.3500		.3500	1-1/4	3-1/2	6	161522	81.58
.3510		.3510	1-1/4	3-1/2	6	161533	89.02
.3520		.3520	1-1/4	3-1/2	6	161544	89.02
.3530		.3530	1-1/4	3-1/2	6	161555	89.02
.3540		.3540	1-1/4	3-1/2	6	161566	89.02
.3543	9mm	.3543	1-1/4	3-1/2	6	161577	92.88
.3550		.3550	1-1/4	3-1/2	6	161588	89.02
.3560		.3560	1-1/4	3-1/2	6	161599	89.02
.3570		.3570	1-1/4	3-1/2	6	161610	89.02
.3580	T	.3580	1-1/4	3-1/2	6	161621	89.02
.3590		.3590	1-1/4	3-1/2	6	161632	90.53
.3594	23/64	.3594	1-1/4	3-1/2	6	161643	87.82
.3600		.3600	1-1/4	3-1/2	6	161654	89.02

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.3610		.3610	1-1/4	3-1/2	6	161665	89.02
.3620		.3620	1-1/4	3-1/2	6	161676	89.02
.3630		.3630	1-1/4	3-1/2	6	161687	89.02
.3640		.3640	1-1/4	3-1/2	6	161698	89.02
.3650		.3650	1-1/4	3-1/2	6	161709	89.02
.3660		.3660	1-1/4	3-1/2	6	161720	89.02
.3670		.3670	1-1/4	3-1/2	6	161731	89.02
.3680	U	.3680	1-1/4	3-1/2	6	161742	89.02
.3690		.3690	1-1/4	3-1/2	6	161753	89.02
.3700		.3700	1-1/4	3-1/2	6	161764	89.02
.3710		.3710	1-1/4	3-1/2	6	161775	89.02
.3720		.3720	1-1/4	3-1/2	6	161786	89.02
.3730		.3730	1-1/4	3-1/2	6	161797	89.02
.3740	9.5mm	.3740	1-1/4	3-1/2	6	161808	74.33
.3745		.3745	1-1/4	3-1/2	6	161819	108.09
.3750	3/8	.3750	1-1/4	3-1/2	6	161830	87.82
.3755		.3755	1-1/4	3-1/2	6	161841	108.09
.3760		.3760	1-1/4	3-1/2	6	161852	111.80
.3765		.3765	1-1/4	3-1/2	6	161863	117.30
.3770	V	.3770	1-1/4	3-1/2	6	161874	111.80
.3780		.3780	1-1/4	3-1/2	6	161885	111.80
.3790		.3790	1-1/4	3-1/2	6	161896	111.80
.3800		.3800	1-1/4	3-1/2	6	161907	111.80
.3810		.3810	1-1/4	3-1/2	6	161918	111.80
.3820		.3820	1-1/4	3-1/2	6	161929	111.80
.3830		.3830	1-1/4	3-1/2	6	161940	111.80
.3840		.3840	1-1/4	3-1/2	6	161951	111.80
.3850		.3850	1-1/4	3-1/2	6	161962	111.80
.3860	W	.3860	1-1/4	3-1/2	6	161973	111.80
.3870		.3870	1-1/4	3-1/2	6	161984	138.67
.3880		.3880	1-1/4	3-1/2	6	161995	138.67
.3890		.3890	1-1/4	3-1/2	6	162006	138.67
.3900		.3900	1-1/4	3-1/2	6	162017	138.67
.3906	25/64	.3906	1-1/4	3-1/2	6	162028	100.67
.3910		.3910	1-1/4	3-1/2	6	162039	138.67
.3920		.3920	1-1/4	3-1/2	6	162050	138.67
.3930		.3930	1-1/4	3-1/2	6	162061	138.67
.3937	10mm	.3937	1-1/4	3-1/2	6	162072	105.05
.3940		.3940	1-1/4	3-1/2	6	162083	138.67
.3950		.3950	1-1/4	3-1/2	6	162094	138.67
.3960		.3960	1-1/4	3-1/2	6	162105	138.67
.3970	X	.3970	1-1/4	3-1/2	6	162116	138.67
.3980		.3980	1-1/4	3-1/2	6	162127	138.67
.3990		.3990	1-1/4	3-1/2	6	162138	138.67
.4000		.4000	1-1/4	3-1/2	6	162149	138.67
.4010		.4010	1-1/4	3-1/2	6	162160	138.67
.4020		.4020	1-1/4	3-1/2	6	162171	138.67
.4030		.4030	1-1/4	3-1/2	6	162182	138.67
.4040	Y	.4040	1-1/4	3-1/2	6	162193	138.67
.4050		.4050	1-1/4	3-1/2	6	162204	138.67
.4060		.4060	1-1/4	3-1/2	6	162215	138.67
.4062	13/32	.4062	1-1/4	3-1/2	6	162226	100.67
.4070		.4070	1-1/4	3-1/2	6	162237	138.67
.4080		.4080	1-1/4	3-1/2	6	162248	138.67
.4090		.4090	1-1/4	3-1/2	6	162259	138.67
.4100		.4100	1-1/4	3-1/2	6	162270	138.67

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



Solid Carbide Reamers



DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4110		.4110	1-1/4	3-1/2	6	162281	138.67
.4120		.4120	1-1/4	3-1/2	6	162292	138.67
.4130	Z	.4130	1-1/4	3-1/2	6	162303	138.67
.4134	10.5mm	.4134	1-1/4	3-1/2	6	162314	126.32
.4140		.4140	1-1/4	3-1/2	6	162325	138.67
.4150		.4150	1-1/4	3-1/2	6	162336	138.67
.4160		.4160	1-3/8	4	6	162347	138.67
.4170		.4170	1-3/8	4	6	162358	138.67
.4180		.4180	1-3/8	4	6	162369	138.67
.4190		.4190	1-3/8	4	6	162380	138.67
.4200		.4200	1-3/8	4	6	162391	138.67
.4210		.4210	1-3/8	4	6	162402	138.67
.4219	27/64	.4219	1-3/8	4	6	162413	114.15
.4220		.4220	1-3/8	4	6	162424	138.67
.4230		.4230	1-3/8	4	6	162435	138.67
.4240		.4240	1-3/8	4	6	162446	138.67
.4250		.4250	1-3/8	4	6	162457	138.67
.4260		.4260	1-3/8	4	6	162468	138.67
.4270		.4270	1-3/8	4	6	162479	138.67
.4280		.4280	1-3/8	4	6	162490	138.67
.4290		.4290	1-3/8	4	6	162501	138.67
.4300		.4300	1-3/8	4	6	162512	138.67
.4310		.4310	1-3/8	4	6	162523	138.67
.4320		.4320	1-3/8	4	6	162534	138.67
.4330		.4330	1-3/8	4	6	162545	138.67
.4331	11mm	.4331	1-3/8	4	6	162556	126.32
.4340		.4340	1-3/8	4	6	162567	138.67
.4350		.4350	1-3/8	4	6	162578	138.67
.4360		.4360	1-3/8	4	6	162589	138.67
.4365		.4365	1-3/8	4	6	162600	138.67
.4370		.4370	1-3/8	4	6	162611	138.67
.4375	7/16	.4375	1-3/8	4	6	162622	114.15
.4380		.4380	1-3/8	4	6	162633	138.67
.4385		.4385	1-3/8	4	6	162644	165.70
.4390		.4390	1-3/8	4	6	162655	138.67
.4400		.4400	1-3/8	4	6	162666	138.67
.4410		.4410	1-3/8	4	6	162677	157.37
.4420		.4420	1-3/8	4	6	162688	157.37
.4430		.4430	1-3/8	4	6	162699	157.37
.4440		.4440	1-3/8	4	6	162710	157.37
.4450		.4450	1-3/8	4	6	162721	157.37
.4460		.4460	1-3/8	4	6	162732	157.37
.4470		.4470	1-3/8	4	6	162743	157.37
.4480		.4480	1-3/8	4	6	162754	157.37
.4490		.4490	1-3/8	4	6	162765	157.37
.4500		.4500	1-3/8	4	6	162776	157.37
.4510		.4510	1-3/8	4	6	162787	157.37
.4520		.4520	1-3/8	4	6	162798	157.37
.4528	11.5mm	.4528	1-3/8	4	6	162809	157.37
.4530		.4530	1-3/8	4	6	162820	144.23
.4531	29/64	.4531	1-3/8	4	6	162831	125.83
.4540		.4540	1-3/8	4	6	162842	157.37
.4550		.4550	1-3/8	4	6	162853	157.37

DEC. EQUIV.	SIZE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	# OF FLUTES	ITEM#	LIST PRICE
.4560		.4560	1-3/8	4	6	162864	157.37
.4570		.4570	1-3/8	4	6	162875	157.37
.4580		.4580	1-3/8	4	6	162886	157.37
.4590		.4590	1-3/8	4	6	162897	157.37
.4600		.4600	1-3/8	4	6	162908	157.37
.4610		.4610	1-3/8	4	6	162919	157.37
.4620		.4620	1-3/8	4	6	162930	157.37
.4630		.4630	1-3/8	4	6	162941	157.37
.4640		.4640	1-3/8	4	6	162952	157.37
.4650		.4650	1-3/8	4	6	162963	157.37
.4660		.4660	1-3/8	4	6	162974	157.37
.4670		.4670	1-3/8	4	6	162985	157.37
.4680		.4680	1-3/8	4	6	162996	157.37
.4688	15/32	.4688	1-3/8	4	6	163007	125.83
.4690		.4690	1-3/8	4	6	163018	165.81
.4700		.4700	1-3/8	4	6	163029	165.81
.4710		.4710	1-3/8	4	6	163040	165.81
.4720		.4720	1-3/8	4	6	163051	165.81
.4724	12mm	.4724	1-3/8	4	6	163062	159.76
.4730		.4730	1-3/8	4	6	163073	165.81
.4740		.4740	1-3/8	4	6	163084	165.81
.4750		.4750	1-3/8	4	6	163095	165.81
.4760		.4760	1-1/2	4	6	163106	165.81
.4770		.4770	1-1/2	4	6	163117	165.81
.4780		.4780	1-1/2	4	6	163128	165.81
.4790		.4790	1-1/2	4	6	163139	165.81
.4800		.4800	1-1/2	4	6	163150	165.81
.4810		.4810	1-1/2	4	6	163161	165.81
.4820		.4820	1-1/2	4	6	163172	165.81
.4830		.4830	1-1/2	4	6	163183	165.81
.4840		.4840	1-1/2	4	6	163194	165.81
.4844	31/64	.4844	1-1/2	4	6	163205	142.54
.4850		.4850	1-1/2	4	6	163216	165.81
.4860		.4860	1-1/2	4	6	163227	165.81
.4870		.4870	1-1/2	4	6	163238	199.96
.4880		.4880	1-1/2	4	6	163249	199.96
.4890		.4890	1-1/2	4	6	163260	199.96
.4900		.4900	1-1/2	4	6	163271	199.96
.4910		.4910	1-1/2	4	6	163282	199.96
.4920		.4920	1-1/2	4	6	163293	199.96
.4921	12.5mm	.4921	1-1/2	4	6	163304	199.96
.4930		.4930	1-1/2	4	6	163315	199.96
.4940		.4940	1-1/2	4	6	163326	199.96
.4950		.4950	1-1/2	4	6	163337	199.96
.4960		.4960	1-1/2	4	6	163348	199.96
.4970		.4970	1-1/2	4	6	163359	199.96
.4980		.4980	1-1/2	4	6	163370	199.96
.4990		.4990	1-1/2	4	6	163381	199.96
.4995		.4995	1-1/2	4	6	163392	199.96
.5000	1/2	.5000	1-1/2	4	6	163403	142.54
.5005		.5005	1-1/2	4	6	163414	199.96
.5010		.5010	1-1/2	4	6	163425	199.96
.5020		.5020	1-1/2	4	6	163436	199.96

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

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

Solid Carbide Reamers



SPECIAL SIZES

PRICES INCLUDE THE FOLLOWING STYLES:

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

SIZE RANGE	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	1 PIECE	2 PIECES	3-5 PIECES	6-11 PIECES	12-17 PIECES	18-23 PIECES	24-35 PIECES	36-49 PIECES	50-74 PIECES
.0401 - .0450	0.037	3/8	1-1/2	203.20	134.44	117.22	75.03	59.40	53.15	50.02	46.89	43.76
.0451 - .0500	0.042	3/8	1-1/2	203.20	134.44	117.22	75.03	59.40	53.15	50.02	46.89	43.76
.0501 - .0570	0.046	3/8	1-1/2	204.76	135.99	118.80	76.59	60.97	54.70	51.58	48.46	45.33
.0571 - .0650	0.053	3/8	1-1/2	203.20	134.44	117.22	75.03	59.40	53.15	50.02	46.89	43.76
.0651 - .0800	0.060	1/2	1-3/4	204.76	135.99	118.80	76.59	60.97	54.70	51.58	48.46	45.33
.0801 - .0950	0.075	1/2	2	206.33	137.55	120.36	78.15	62.52	56.27	53.15	50.02	46.89
.0951 - .1150	0.090	5/8	2-1/4	209.45	140.67	123.49	81.28	65.64	59.40	56.27	53.15	50.02
.1151 - .1300	0.110	5/8	2-1/4	211.02	142.24	125.04	82.84	67.21	60.97	57.82	54.70	51.58
.1301 - .1450	0.125	3/4	2-1/2	215.70	146.93	129.74	87.54	71.90	65.64	62.52	59.40	56.27
.1451 - .1600	0.140	3/4	2-1/2	220.40	151.62	134.44	92.23	76.59	70.34	67.21	64.09	60.97
.1601 - .1750	0.155	7/8	2-3/4	225.08	156.31	139.11	96.90	81.28	75.03	71.90	68.78	65.64
.1751 - .1950	0.170	7/8	2-3/4	231.34	162.55	145.36	103.16	87.54	81.28	78.15	75.03	71.90
.1951 - .2100	0.188	1	3	243.84	175.07	157.88	115.67	100.03	93.78	90.66	87.54	84.41
.2101 - .2250	0.205	1	3	248.53	179.76	162.55	120.36	104.73	98.47	95.35	92.23	89.08
.2251 - .2400	0.220	1	3	256.34	187.57	170.37	128.17	112.55	106.29	103.16	100.03	96.90
.2401 - .2550	0.235	1	3	262.61	193.82	176.63	134.44	118.80	112.55	109.41	106.29	103.16
.2551 - .2750	0.250	1	3-1/4	278.23	209.45	192.26	150.06	134.44	128.17	125.04	121.92	118.80
.2751 - .2950	0.270	1-1/8	3-1/4	279.78	211.02	193.82	151.62	135.99	129.74	126.62	123.49	120.36
.2951 - .3150	0.290	1-1/8	3-1/4	295.41	226.64	209.45	167.25	151.62	145.36	142.24	139.11	135.99
.3151 - .3350	0.313	1-1/4	3-1/2	317.31	248.53	231.34	189.14	173.50	167.25	164.13	161.00	157.88
.3351 - .3550	0.330	1-1/4	3-1/2	320.43	254.79	234.46	192.26	176.63	170.37	167.25	164.13	161.00
.3551 - .3800	0.350	1-1/4	3-1/2	326.67	261.03	240.71	198.51	182.88	176.63	173.50	170.37	167.25
.3801 - .4100	0.375	1-1/4	4	350.12	281.35	264.15	221.95	206.33	200.08	196.96	193.82	190.69
.4101 - .4400	0.405	1-3/8	4	362.63	293.87	276.66	234.46	218.83	212.58	209.45	206.33	203.20
.4401 - .4700	0.438	1-3/8	4	381.39	312.63	295.41	253.22	237.58	231.34	228.22	225.08	221.95
.4701 - .5050	0.465	1-1/2	4	412.65	343.89	326.67	284.48	268.84	262.61	259.48	256.34	253.22
.5051 - .5400	0.500	1-1/2	4-1/2	453.29	384.52	367.33	325.13	309.49	303.23	300.11	296.99	293.87
.5401 - .5800	0.535	1-1/2	4-1/2	515.82	447.04	429.85	387.65	372.02	365.76	362.63	359.51	356.39
.5801 - .6260	0.575	1-3/4	4-1/2	565.84	497.06	479.87	437.66	422.03	415.78	412.65	409.53	406.40
.6261 - .6600	0.615	1-3/4	4-1/2	640.87	572.09	554.90	512.69	497.06	490.81	487.68	484.56	481.43
.6601 - .7050	0.655	2	5	734.65	665.88	648.67	606.47	590.85	584.59	581.47	578.35	575.21
.7051 - .7550	0.700	2	5	797.17	728.41	711.19	669.00	653.37	647.11	643.99	640.87	637.73
.7551 - .7950	0.750	2	5	859.70	790.93	773.73	731.53	715.89	709.64	706.51	703.39	700.27
.7951 - .8450	0.750	2-1/4	5	922.22	853.45	836.26	794.05	778.42	772.16	769.04	765.91	762.79
.8451 - .9000	0.750	2-1/4	5	1,047.26	978.50	961.30	919.10	903.47	897.20	894.08	890.96	887.84
.9001 - .9600	0.875	2-1/4	5	1,203.58	1,134.80	1,117.61	1,075.40	1,059.77	1,053.53	1,050.38	1,047.26	1,044.14
.9601 - 1.025	0.875	2-1/4	5	1,328.63	1,259.85	1,242.65	1,200.45	1,184.82	1,178.57	1,175.44	1,172.32	1,169.18

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

DIAMETER TOLERANCE +.0003, -.0000



Solid Carbide Burs

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
REAMERS

CARBIDE
REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS

CARBIDE BURS

SA - CYLINDRICAL



UNCOATED



TIN COATED

SA - CYLINDRICAL

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SA-41	1/16	1/8	3/16	1-1/2	122461	8.14	122131	8.14	122472	10.17	122142	10.17
SA-42	3/32	1/8	7/16	1-1/2	122483	8.14	122153	8.14	122494	10.17	122164	10.17
SA-43	1/8	1/8	9/16	1-1/2	122505	8.14	122175	8.14	122516	10.17	122186	10.17
SA-52	5/32	1/8	1/2	1-1/2	122527	27.14	122197	27.14	122538	33.95	122208	33.95
SA-53	3/16	1/8	1/2	1-1/2	122549	27.14	122219	27.14	122560	33.95	122230	33.95
SA-51	1/4	1/8	1/2	1-3/4	122571	12.05	122241	12.05	122582	15.06	122252	15.06
SA-11	1/8	1/4	1/2	2	122593	19.30	122263	19.30	122604	24.12	122274	24.12
SA-13	5/32	1/4	5/8	2	129171	22.35	128973	22.35	129182	27.94	128984	27.94
SA-14	3/16	1/4	5/8	2	122615	19.30	122285	19.30	122626	24.12	122296	24.12
SA-1	1/4	1/4	5/8	2	122637	13.67	122307	13.67	122648	17.09	122318	17.09
SA-2	5/16	1/4	3/4	2-1/2	122659	25.23	122329	25.23	122670	31.55	122340	31.55
SA-3	3/8	1/4	3/4	2-1/2	122681	16.93	122351	16.93	122692	21.17	122362	21.17
SA-4	7/16	1/4	1	2-3/4	122703	39.22	122373	39.22	122714	49.02	122384	49.02
SA-5	1/2	1/4	1	2-3/4	122725	26.99	122395	26.99	122736	33.75	122406	33.75
SA-6	5/8	1/4	1	2-3/4	122747	33.84	122417	33.84	122758	42.31	122428	42.31
SA-7	3/4	1/4	1	2-3/4	122769	52.79	122439	52.79	122780	66.00	122450	66.00
SA-9	1	1/4	1	2-3/4	129193	83.36	128995	83.36	129204	104.21	129006	104.21

SA - CYLINDRICAL - EXTENDED SHANK LENGTHS

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SA-1L6	1/4	1/4	1/2	6-3/4	127829	27.71	127763	27.71	127840	34.63	127774	34.63
SA-3L6	3/8	1/4	3/4	6-3/4	127851	39.02	127785	39.02	127862	48.77	127796	48.77
SA-5L6	1/2	1/4	1	7	127873	60.98	127807	60.98	127884	76.22	127818	76.22

SA - CYLINDRICAL - FOR ALUMINUM

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT UNCOATED	LIST PRICE	—	—	ALUMA CUT TIN	LIST PRICE
SA-1NF	1/4	1/4	3/4	2	—	—	128423	19.80	—	—	128434	24.75
SA-3NF	3/8	1/4	3/4	2-1/2	—	—	128445	27.65	—	—	128456	34.57
SA-5NF	1/2	1/4	1	2-3/4	—	—	128467	46.18	—	—	128478	57.74
SA-6NF	5/8	1/4	1	2-3/4	—	—	128489	59.69	—	—	128500	74.61
SA-7NF	3/4	1/4	1	2-3/4	—	—	128511	78.44	—	—	128522	98.05

SB - CYLINDRICAL END CUT



UNCOATED



TOP VIEW
END CUT



TIN COATED

SB - CYLINDRICAL END CUT

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SB-41	1/16	1/8	1/4	1-1/2	129259	10.97	122791	10.97	129270	13.71	122802	13.71
SB-42	3/32	1/8	7/16	1-1/2	129237	8.67	122813	8.67	129248	10.85	122824	10.85
SB-43	1/8	1/8	9/16	1-1/2	129215	7.92	122835	7.92	129226	9.89	122846	9.89
SB-51	1/4	1/8	3/16	1-7/16	123033	12.07	122857	12.07	123044	15.10	122868	15.10
SB-51	1/4	1/8	1/2	1-3/4	123055	13.16	122879	13.16	123066	16.44	122890	16.44
SB-11	1/8	1/4	1/2	2	123077	20.87	122901	20.87	123088	26.08	122912	26.08
SB-13	5/32	1/4	5/8	2	129281	25.22	129017	25.22	129292	31.53	129028	31.53
SB-14	3/16	1/4	5/8	2	123099	20.87	122923	20.87	123110	26.08	122934	26.08
SB-1	1/4	1/4	5/8	2	123121	16.22	122945	16.22	123132	20.29	122956	20.29
SB-2	5/16	1/4	3/4	2-1/2	123143	27.77	122967	27.77	123154	34.70	122978	34.70
SB-3	3/8	1/4	3/4	2-1/2	123165	19.36	122989	19.36	123176	24.20	123000	24.20
SB-4	7/16	1/4	1	2-3/4	123187	44.58	129039	44.58	123198	55.74	129050	55.74
SB-5	1/2	1/4	1	2-3/4	123209	29.71	123011	29.71	123220	37.14	123022	37.14
SB-6	5/8	1/4	1	2-3/4	123231	37.88	129369	37.87	123242	47.33	129380	47.33
SB-7	3/4	1/4	1	2-3/4	123253	58.15	129061	58.15	123264	72.69	129072	72.69
SB-9	1	1/4	1	2-3/4	129303	90.95	129083	90.95	129314	113.69	129094	113.69

Solid Carbide Burs



SC - CYLINDRICAL BALL NOSE



UNCOATED



TIN COATED

SC - CYLINDRICAL BALL NOSE												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SC-41	3/32	1/8	7/16	1-1/2	123583	8.14	123275	8.14	123594	10.17	123286	10.17
SC-42	1/8	1/8	9/16	1-1/2	123605	8.14	123297	8.14	123616	10.17	123308	10.17
SC-52	5/32	1/8	1/2	1-1/2	123627	27.14	123319	27.14	123638	33.95	123330	33.95
SC-53	3/16	1/8	1/2	1-1/2	123649	27.14	123341	27.14	123660	33.95	123352	33.95
SC-51	1/4	1/8	1/2	1-3/4	123671	12.07	123363	12.07	123682	15.10	123374	15.10
SC-11	1/8	1/4	1/2	2	123693	22.46	123385	22.46	123704	28.05	123396	28.05
SC-13	5/32	1/4	5/8	2	129325	25.67	129105	25.67	129336	32.10	129116	32.10
SC-14	3/16	1/4	5/8	2	123715	22.46	123407	22.46	123726	28.05	123418	28.05
SC-1	1/4	1/4	5/8	1-3/4	123737	16.25	123429	16.25	123748	20.32	123440	20.32
SC-2	5/16	1/4	3/4	2-1/2	123759	27.28	123451	27.28	123770	34.11	123462	34.11
SC-3	3/8	1/4	3/4	2-1/2	123781	19.63	123473	19.63	123792	24.54	123484	24.54
SC-4	7/16	1/4	1	2-3/4	123803	43.10	123495	43.10	123814	53.89	123506	53.89
SC-5	1/2	1/4	1	2-3/4	123825	30.46	123517	30.46	123836	38.07	123528	38.07
SC-6	5/8	1/4	1	2-3/4	123847	39.45	123539	39.45	123858	49.32	123550	49.32
SC-7	3/4	1/4	1	2-3/4	123869	56.86	123561	56.86	123880	71.08	123572	71.08
SC-9	1	1/4	1	2-3/4	129457	85.97	129435	85.97	129468	107.46	129446	107.46

SC - CYLINDRICAL BALL NOSE - EXTENDED SHANK LENGTHS												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SC-1L6	1/4	1/4	1/2	6-3/4	127961	32.26	127895	32.26	127972	40.35	127906	40.35
SC-3L6	3/8	1/4	3/4	6-3/4	127983	43.48	127917	43.48	127994	54.34	127928	54.34
SC-5L6	1/2	1/4	1	7	128005	68.41	127939	68.41	128016	85.53	127950	85.53

SC - CYLINDRICAL BALL NOSE - FOR ALUMINUM												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT UNCOATED	LIST PRICE	—	—	ALUMA CUT TIN	LIST PRICE
SC-1NF	1/4	1/4	3/4	2	—	—	128533	19.46	—	—	128544	24.33
SC-3NF	3/8	1/4	3/4	2-1/2	—	—	128555	25.97	—	—	128566	32.46
SC-5NF	1/2	1/4	1	2-3/4	—	—	128577	36.80	—	—	128588	46.00
SC-7NF	3/4	1/4	1	2-3/4	—	—	128599	77.55	—	—	128610	96.94

SE - EGG SHAPE



UNCOATED



TIN COATED

SE - EGG SHAPE												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SE-41	1/8	1/8	7/32	1-1/2	125695	8.14	125519	8.14	125706	10.17	125530	10.17
SE-53	3/16	1/8	9/32	1-1/2	125717	27.14	125541	27.14	125728	33.95	125552	33.95
SE-51	1/4	1/8	3/8	1-5/8	125739	12.05	125563	12.05	125750	15.06	125574	15.06
SE-1	1/4	1/4	3/8	2	125761	19.30	125585	19.30	125772	24.12	125596	24.12
SE-3	3/8	1/4	5/8	2-3/8	125783	20.31	125607	20.31	125794	25.39	125618	25.39
SE-5	1/2	1/4	7/8	2-5/8	125805	28.42	125629	28.42	125816	35.53	125640	35.53
SE-6	5/8	1/4	1	2-3/4	125827	39.02	125651	39.02	125838	48.77	125662	48.77
SE-7	3/4	1/4	1	2-3/4	125849	54.58	125673	54.58	125860	68.23	125684	68.23

SE - EGG SHAPE - FOR ALUMINUM												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT UNCOATED	LIST PRICE	—	—	ALUMA CUT TIN	LIST PRICE
SE-3NF	3/8	1/4	5/8	2-3/8	—	—	128731	26.96	—	—	128742	33.69
SE-5NF	1/2	1/4	7/8	2-5/8	—	—	128753	46.89	—	—	128764	43.54
SE-6NF	5/8	1/4	1	2-3/4	—	—	128775	57.77	—	—	128786	72.22
SE-7NF	3/4	1/4	1	2-3/4	—	—	128797	82.67	—	—	128808	103.33

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Burs

SD - BALL SHAPE



UNCOATED



TIN COATED

SD - BALL SHAPE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SD-40	1/16	1/8	1/16	1-1/2	-	-	126267	10.97	-	-	126278	13.71
SD-41	3/32	1/8	3/32	1-1/2	126531	8.14	126289	8.14	126542	10.17	126300	10.17
SD-42	1/8	1/8	1/8	1-1/2	126553	8.14	129127	8.14	126564	10.17	129138	10.17
SD-53	3/16	1/8	3/16	1-1/2	126575	27.14	-	-	126586	33.95	-	-
SD-51	1/4	1/8	1/4	1-3/4	126597	12.05	126311	12.05	126608	15.06	126322	15.06
SD-11	1/8	1/4	1/8	2	126619	20.61	126333	20.61	126630	25.76	126344	25.76
SD-14	3/16	1/4	3/16	2	126641	20.61	126355	20.61	126652	25.76	126366	25.76
SD-1	1/4	1/4	1/4	2	126663	15.78	126377	15.78	126674	19.74	126388	19.74
SD-2	5/16	1/4	5/16	2-1/32	126685	22.18	126399	22.18	126696	27.71	126410	27.71
SD-3	3/8	1/4	3/8	2-5/64	126707	16.93	126421	16.93	126718	21.17	126432	21.17
SD-4	7/16	1/4	7/16	2-9/64	126729	28.65	126443	28.65	126740	35.81	126454	35.81
SD-5	1/2	1/4	1/2	2-13/64	126751	22.95	126465	22.95	126762	28.68	126476	28.68
SD-6	5/8	1/4	5/8	2-5/16	126773	31.08	126487	31.08	126784	38.84	126498	38.84
SD-7	3/4	1/4	3/4	2-7/16	126795	42.88	126509	42.88	126806	53.61	126520	53.61
SD-9	1	1/4	1	2-11/16	129347	90.95	129149	90.95	129358	113.69	129160	113.69

SD - BALL SHAPE - EXTENDED SHANK LENGTHS

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SD-1L6	1/4	1/4	1/4	6-1/4	128093	29.76	128027	29.76	128104	37.21	128038	37.21
SD-3L6	3/8	1/4	3/8	6-3/8	128115	35.76	128049	35.76	128126	44.70	128060	44.70
SD-5L6	1/2	1/4	1/2	6-1/2	128137	48.19	128071	48.19	128148	60.23	128082	60.23

SD - BALL SHAPE - FOR ALUMINUM

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	-	-	ALUMA CUT UNCOATED	LIST PRICE	-	-	ALUMA CUT TIN	LIST PRICE
SD-1NF	1/4	1/4	1/4	2	-	-	128885	19.19	-	-	128896	23.98
SD-3NF	3/8	1/4	3/8	2-1/2	-	-	128907	24.27	-	-	128918	30.32
SD-5NF	1/2	1/4	1/2	2-13/64	-	-	128929	39.79	-	-	128940	49.73
SD-6NF	5/8	1/4	5/8	2-5/16	-	-	128951	52.10	-	-	128962	65.13

SG - POINTED TREE



UNCOATED



TIN COATED

SG - POINTED TREE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SG-41	1/8	1/8	1/4	1-1/2	124749	8.10	124463	8.10	124760	10.14	124474	10.14
SG-42	1/8	1/8	5/16	1-1/2	124771	8.10	124485	8.10	124782	10.14	124496	10.14
SG-43	1/8	1/8	3/8	1-1/2	124793	8.10	124507	8.10	124804	10.14	124518	10.14
SG-44	1/8	1/8	1/2	1-1/2	124815	11.26	124529	11.26	124826	14.07	124540	14.07
SG-53	3/16	1/8	1/2	1-1/2	124837	27.14	124551	27.14	124848	33.95	124562	33.95
SG-51	1/4	1/8	1/2	1-3/4	124859	12.05	124573	12.05	124870	15.06	124584	15.06
SG-1	1/4	1/4	5/8	2	124881	17.94	124595	17.94	124892	22.43	124606	22.43
SG-2	5/16	1/4	3/4	2-1/2	124903	28.45	124617	28.45	124914	35.55	124628	35.55
SG-3	3/8	1/4	3/4	2-1/2	124925	20.25	124639	20.25	124936	25.30	124650	25.30
SG-13	1/2	1/4	3/4	2-1/2	124947	42.90	124661	42.90	124958	53.63	124672	53.63
SG-5	1/2	1/4	1	2-3/4	124969	29.71	124683	29.71	124980	37.14	124694	37.14
SG-6	5/8	1/4	1	2-3/4	124991	40.07	124705	40.07	125002	50.09	124716	50.09
SG-7	3/4	1/4	1	2-3/4	125013	53.64	124727	53.64	125024	67.06	124738	67.06

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT DRILLS

HSS & COBALT REAMERS

Solid Carbide Burs



SF - ROUND NOSE TREE



UNCOATED



TIN COATED

SF - ROUND NOSE TREE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SF-41	1/8	1/8	1/4	1-1/2	124177	8.14	123891	8.14	124188	10.17	123902	10.17
SF-42	1/8	1/8	1/2	1-1/2	124199	8.14	123913	8.14	124210	10.17	123924	10.17
SF-53	3/16	1/8	1/2	1-1/2	124221	27.14	123935	27.14	124232	33.95	123946	33.95
SF-51	1/4	1/8	1/2	1-3/4	124243	12.05	123957	12.05	124254	15.06	123968	15.06
SF-1	1/4	1/4	3/4	2	124265	17.60	123979	17.60	124276	22.00	123990	22.00
SF-3	3/8	1/4	3/4	2-1/2	124287	19.63	124001	19.63	124298	24.54	124012	24.54
SF-4	7/16	1/4	1	2-3/4	124309	41.07	124023	41.07	124320	51.34	124034	51.34
SF-13	1/2	1/4	3/4	2-1/2	124331	43.73	124045	43.73	124342	54.67	124056	54.67
SF-5	1/2	1/4	1	2-3/4	124353	29.48	124067	29.48	124364	36.86	124078	36.86
SF-6	5/8	1/4	1	2-3/4	124375	39.26	124089	39.26	124386	49.08	124100	49.08
SF-7	3/4	1/4	1	2-3/4	124397	54.84	124111	54.84	124408	68.54	124122	68.54
SF-14	3/4	1/4	1-1/4	3	124419	99.87	124133	99.87	124430	124.82	124144	124.82
SF-15	3/4	1/4	1-1/2	3	124441	117.27	124155	117.27	124452	146.58	124166	146.58

SF - ROUND NOSE TREE - EXTENDED SHANK LENGTHS

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SF-1L6	1/4	1/4	5/8	6-3/4	128225	33.66	128159	33.66	128236	42.07	128170	42.07
SF-3L6	3/8	1/4	3/4	6-3/4	128247	42.63	128181	42.63	128258	53.29	128192	53.29
SF-5L6	1/2	1/4	1	7	128269	62.87	128203	62.87	128280	78.57	128214	78.57

SF - ROUND NOSE TREE - FOR ALUMINUM

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	—	—	ALUMA CUT UNCOATED	LIST PRICE	—	—	ALUMA CUT TIN	LIST PRICE
SF-1NF	1/4	1/4	3/4	2	—	—	128621	19.84	—	—	128632	24.82
SF-3NF	3/8	1/4	3/4	2-1/2	—	—	128643	26.22	—	—	128654	32.78
SF-5NF	1/2	1/4	1	2-3/4	—	—	128665	46.42	—	—	128676	46.00
SF-6NF	5/8	1/4	1	2-3/4	—	—	128687	61.57	—	—	128698	64.81
SF-14NF	3/4	1/4	1-1/4	3	—	—	128709	74.92	—	—	128720	93.65

SH - FLAME SHAPE



UNCOATED



TIN COATED

SH - FLAME SHAPE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SH-41	1/8	1/8	1/4	1-1/2	126949	8.14	126817	8.14	126960	10.17	126828	10.17
SH-53	3/16	1/8	3/8	1-1/2	126971	27.14	126839	27.14	126982	33.95	126850	33.95
SH-1	1/4	1/4	5/8	2	129523	19.07	129501	19.07	129534	23.84	129512	23.84
SH-2	5/16	1/4	3/4	2-1/2	126993	22.00	126861	22.00	127004	27.50	126872	27.50
SH-5	1/2	1/4	1-1/4	3	127015	42.63	126883	42.63	127026	53.30	126894	53.30
SH-6	5/8	1/4	1-7/16	3-3/16	127037	87.38	126905	87.38	127048	109.23	126916	109.23
SH-7	3/4	1/4	1-5/8	3-3/8	127059	110.99	126927	110.99	127070	138.72	126938	138.72

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Solid Carbide Burs

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

SJ - 60° INCLUDED ANGLE



UNCOATED



TIN COATED

SJ - 60° INCLUDED ANGLE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SJ-42	1/8	1/8	3/32	1-1/2	127675	8.14	127587	8.14	127686	10.17	127598	10.17
SJ-1	1/4	1/4	3/16	2	127697	15.78	127609	15.78	127708	19.74	127620	19.74
SJ-3	3/8	1/4	5/16	2-3/16	127719	19.37	127631	19.37	127730	24.21	127642	24.21
SJ-5	1/2	1/4	7/16	2-19/64	127741	26.54	127653	26.54	127752	33.20	127664	33.20

SK - 90° INCLUDED ANGLE



UNCOATED



TIN COATED

SK - 90° INCLUDED ANGLE

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SK-42	1/8	1/8	1/16	1-1/2	127499	8.14	127411	8.14	127510	10.17	127422	10.17
SK-1	1/4	1/4	1/8	2	127521	15.78	127433	15.78	127532	19.74	127444	19.74
SK-3	3/8	1/4	3/16	2-1/16	127543	16.34	127455	16.34	127554	20.44	127466	20.44
SK-5	1/2	1/4	1/4	2-1/8	127565	25.58	127477	25.58	127576	25.66	127488	25.66
SK-7	3/4	1/4	3/8	2-1/4	129413	45.30	129391	45.30	129424	56.63	129402	56.63

SL - INCLUDED ANGLE WITH RADIUS END



UNCOATED



TIN COATED

SL - INCLUDED ANGLE WITH RADIUS END

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SL-41	1/8	1/8	3/8	1-1/2	8°	126069	8.10	125871	8.10	126080	10.14	125882	10.14
SL-42	1/8	1/8	1/2	1-1/2	8°	126091	8.10	125893	8.10	126102	10.14	125904	10.14
SL-53	3/16	1/8	1/2	1-1/2	14°	126113	27.14	125915	27.14	126124	33.95	125926	33.95
SL-1	1/4	1/4	5/8	2	14°	126135	16.45	125937	16.45	126146	20.57	125948	20.57
SL-2	5/16	1/4	7/8	2-3/4	14°	126157	31.45	125959	31.45	126168	39.31	125970	39.31
SL-3	3/8	1/4	1-1/16	2-15/16	14°	126179	22.75	125981	22.75	126190	28.45	125992	28.45
SL-4	1/2	1/4	1-1/4	3	14°	126201	46.11	126003	46.11	126212	57.64	126014	57.64
SL-6	5/8	1/4	1-5/16	3-3/16	14°	126223	64.30	126025	64.30	126234	80.38	126036	80.38
SL-7	3/4	1/4	1-1/2	3-3/8	14°	126245	87.99	126047	87.99	126256	109.99	126058	109.99

SL - INCLUDED ANGLE WITH RADIUS END - EXTENDED SHANK LENGTHS

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SL-1L6	1/4	1/4	5/8	6-5/8	14°	128357	34.47	128291	34.47	128368	43.10	128302	43.10
SL-3L6	3/8	1/4	1-1/16	7-1/16	14°	128379	54.31	128313	54.31	128390	67.88	128324	67.88
SL-4L6	1/2	1/4	1-1/4	7-1/4	14°	128401	66.53	128335	66.53	128412	83.19	128346	83.19

SL - INCLUDED ANGLE WITH RADIUS END - FOR ALUMINUM

SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	INCL. ANGLE	—	—	ALUMA CUT UNCOATED	LIST PRICE	—	—	ALUMA CUT TIN	LIST PRICE
SL-4NF	1/2	1/4	1-1/4	3	14°	—	—	128819	46.53	—	—	128830	58.16
SL-6NF	5/8	1/4	1-5/16	3-3/16	14°	—	—	128841	81.49	—	—	128852	101.86
SL-7NF	3/4	1/4	1-1/2	3-3/8	14°	—	—	128863	101.21	—	—	128874	126.50

Solid Carbide Burs



SM - POINTED CONE



UNCOATED



TIN COATED

SM - POINTED CONE												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SM-41	1/8	1/8	11/32	1-1/2	125277	8.14	125035	8.14	125288	10.17	125046	10.17
SM-42	1/8	1/8	7/16	1-1/2	125299	8.14	125057	8.14	125310	10.17	125068	10.17
SM-43	1/8	1/8	5/8	1-1/2	125321	8.14	125079	8.14	125332	10.17	125090	10.17
SM-53	3/16	1/8	1/2	1-1/2	125343	27.14	125101	27.14	125354	33.95	125112	33.95
SM-51	1/4	1/8	1/2	1-7/8	125365	12.05	125123	12.05	125376	15.06	125134	15.06
SM-1	1/4	1/4	1/2	2	125387	15.44	125145	15.44	125398	19.31	125156	19.31
SM-2	1/4	1/4	3/4	2	125409	23.95	125167	23.95	125420	29.94	125178	29.94
SM-3	1/4	1/4	1	2	125431	17.25	125189	17.25	125442	21.59	125200	21.59
SM-4	3/8	1/4	5/8	2-1/2	125453	23.01	125211	23.01	125464	28.76	125222	28.76
SM-5	1/2	1/4	7/8	2-3/4	125475	32.21	125233	32.21	125486	40.27	125244	40.27
SM-6	5/8	1/4	1	2-7/8	125497	63.24	125255	63.24	125508	79.05	125266	79.05

SN - INVERTED TAPER



UNCOATED



TIN COATED

SN - INVERTED TAPER												
SIZE	DIA.	SHANK DIA.	LENGTH OF CUT	OVERALL LENGTH	DOUBLE CUT UNCOATED	LIST PRICE	STANDARD CUT UNCOATED	LIST PRICE	DOUBLE CUT TIN	LIST PRICE	STANDARD CUT TIN	LIST PRICE
SN-41	3/32	1/8	3/16	1-1/2	-	-	127081	7.92	-	-	127092	9.89
SN-42	1/8	1/8	3/16	1-1/2	127213	8.14	127103	8.14	127224	10.17	127114	10.17
SN-53	3/16	1/8	1/4	1-1/2	127235	27.14	127125	27.14	127246	33.95	127136	33.95
SN-51	1/4	1/8	1/4	1-1/2	127257	12.05	127147	12.05	127268	15.06	127158	15.06
SN-1	1/4	1/4	5/16	2	127279	15.71	127169	15.71	127290	19.63	127180	19.63
SN-4	1/2	1/4	1/2	2-1/4	127301	45.84	127191	45.84	127312	57.31	127202	57.31

CARBIDE BUR SETS

SET SIZES	# OF PCS. IN SET	DIA.	SHANK DIAMETER	CASE TYPE	TYPE	UNCOATED SET ITEM#	LIST PRICE	TIN SET 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	119.67	127334	156.31
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	128.67	127356	165.78
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	196.03	127378	219.78
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	351.73	127400	378.93
SC-3, SD-3, SF-3, SG-3, SA-5, SC-5, SF-5, SL-4	8 PCS.	-	1/4	WOOD	DOUBLE CUT	129479	226.50	129490	282.30
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	225.31	129556	279.47

CARBIDE BURS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Technical Information

Micrograin Solid Carbide Endmills - Technical Information

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

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

GENERAL RECOMMENDATIONS

The above suggested parameters are recommended for uncoated tools only. When various coatings are applied, SFM may be increased accordingly. These general percentages are as follows under optimal conditions:

TICN = +25% ZRN = +30% ALTIN = +40%

RIGIDITY

Maximize rigidity to reduce chatter and increase tool life. Ways to improve rigidity include choosing the largest diameter possible to perform your milling task, use the shortest LOC (Length of Cut) available, and always use the tool holder which offers the shortest gage line (Shortest Tool Holder Length).

CHATTER

If chatter is present increase feed or reduce speed.

Micrograin Solid Carbide Burs - Technical Information

SELECTION BY CUT

Single Cut:

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

Double Cut:

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

Aluminum Cut:

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

SOLID CARBIDE BURS - SPEEDS & FEEDS

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

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

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

TECHNICAL INFORMATION

Solid Carbide Countersinks



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	15.77
3/16	3/16	2	1	118853	118941	119029	216324	16.83
1/4	1/4	2	1	118864	118952	119040	216335	19.14
3/8	1/4	2-5/8	1	118875	118963	119051	216346	34.65
1/2	1/4	2-5/8	1	118886	118974	119062	216357	42.90
5/8	3/8	2-3/4	1	118897	118985	119073	216368	62.70
3/4	3/8	2-3/4	1	118908	118996	119084	216379	85.80
1	1/2	3	1	118919	119007	119095	216390	131.34



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	15.77
3/16	3/16	2	1	119117	119205	119293	216412	16.83
1/4	1/4	2	1	119128	119216	119304	216423	19.14
3/8	1/4	2-5/8	1	119139	119227	119315	216434	34.65
1/2	1/4	2-5/8	1	119150	119238	119326	216445	42.90
5/8	3/8	2-3/4	1	119161	119249	119337	216456	62.70
3/4	3/8	2-3/4	1	119172	119260	119348	216467	85.80
1	1/2	3	1	119183	119271	119359	216478	131.34



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	15.77
3/16	3/16	2	1	119491	119579	119667	216500	16.83
1/4	1/4	2	1	119502	119590	119678	216511	19.14
3/8	1/4	2-5/8	1	119513	119601	119689	216522	34.65
1/2	1/4	2-5/8	1	119524	119612	119700	216533	42.90
5/8	3/8	2-3/4	1	119535	119623	119711	216544	62.70
3/4	3/8	2-3/4	1	119546	119634	119722	216555	85.80
1	1/2	3	1	119557	119645	119733	216566	131.34

CARBIDE COUNTERSINKS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Combined Drill & Countersinks



SOLID CARBIDE - REGULAR - 60° UNCOATED

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	216302	23.06
0	1/32	1/8	1-1/2	1	216291	22.05
1	3/64	1/8	1-1/2	1	118776	20.06
2	5/64	3/16	2	1	118787	29.85
3	7/64	1/4	2	1	118798	33.67
4	1/8	5/16	2-1/8	1	118809	43.48
5	3/16	7/16	2-3/4	1	118820	68.92
6	7/32	1/2	3	1	118831	85.79



SOLID CARBIDE - REGULAR - 60° ALTiN COATED

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
00	.025	1/8	1-1/2	1	118833	28.82
0	1/32	1/8	1-1/2	1	118834	27.57
1	3/64	1/8	1-1/2	1	118835	25.08
2	5/64	3/16	2	1	118836	37.32
3	7/64	1/4	2	1	118837	42.08
4	1/8	5/16	2-1/8	1	118838	54.35
5	3/16	7/16	2-3/4	1	118839	86.15
6	7/32	1/2	3	1	118840	107.22



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	8.05
1	3/64	1/8	1-1/4	12	118578	5.64
2	5/64	3/16	1-7/8	12	118589	5.93
3	7/64	1/4	2	12	118600	6.20
4	1/8	5/16	2-1/8	12	118611	6.47
5	3/16	7/16	2-3/4	12	118622	12.61
6	7/32	1/2	3	12	118633	19.26
7	1/4	5/8	3-1/4	6	118644	29.85
8	5/16	3/4	3-1/2	3	118655	42.23



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	13.15
0	1/32	1/8	1-1/4	12	119458	13.15
1	3/64	1/8	1-1/4	12	119370	10.51
2	5/64	3/16	1-7/8	12	119381	10.78
3	7/64	1/4	2	12	119392	14.69
4	1/8	5/16	2-1/8	12	119403	15.14
5	3/16	7/16	2-3/4	12	119414	21.07
6	7/32	1/2	3	12	119425	33.66
7	1/4	5/8	3-1/4	6	119436	48.37
8	5/16	3/4	3-1/2	3	119447	77.82

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	8.64
0000	.015	1/8	1-1/4	12	118556	7.87
000	.020	1/8	1-1/4	12	118545	7.54
00	.025	1/8	1-1/4	12	118534	7.54

M42 COBALT - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	12	118732	14.88
2	5/64	3/16	1-7/8	12	118743	15.25
3	7/64	1/4	2	12	118754	15.90
4	1/8	5/16	2-1/8	12	118765	16.34

HIGH SPEED STEEL - 90°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1	3/64	1/8	1-1/4	12	118688	20.83
2	5/64	3/16	1-7/8	12	118699	21.42
3	7/64	1/4	2	12	118710	22.34
4	1/8	5/16	2-1/8	12	118721	22.94

COMBINED DRILL & COUNTERSINK SET - 60°

SIZE	SET ITEM#	LIST PRICE
#1 - #5 HSS - 60	118677	57.55

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

Countersinks



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	16.70
1x4	3/64	1/8	1	119843	17.31
1x5	3/64	1/8	1	119854	24.22
1x6	3/64	1/8	1	119865	31.57
2x3	5/64	3/16	1	119876	17.01
2x4	5/64	3/16	1	119887	19.48
2x5	5/64	3/16	1	119898	24.24
2x6	5/64	3/16	1	119909	31.79
3x3	7/64	1/4	1	119920	17.89

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	ITEM#	LIST PRICE
3x4	7/64	1/4	1	119931	18.96
3x5	7/64	1/4	1	119942	26.44
3x6	7/64	1/4	1	119953	32.15
4x4	1/8	5/16	1	119975	20.43
4x5	1/8	5/16	1	119986	28.50
4x6	1/8	5/16	1	119997	32.91
4-1/2x4	9/64	3/8	1	119964	24.49
4-1/2x5	9/64	3/8	1	120008	34.92
4-1/2x6	9/64	3/8	1	120052	39.02

SIZE	DRILL DIA.	BODY DIA.	PKG. QTY.	ITEM#	LIST PRICE
5x4	3/16	7/16	1	120019	28.69
5x5	3/16	7/16	1	120030	33.13
5x6	3/16	7/16	1	120041	37.18
6x5	7/32	1/2	1	120063	35.33
6x6	7/32	1/2	1	120074	42.07
7x6	1/4	5/8	1	120085	82.46
8x6	5/16	3/4	1	120096	94.97
-	-	-	-	-	-
-	-	-	-	-	-

COMBINED DRILL & COUNTERSINKS



HIGH SPEED STEEL - BELL TYPE - 60°

SIZE	DRILL DIA.	BODY DIA.	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
11	3/64	1/8	1-1/4	12	119744	7.80
12	1/16	3/16	1-7/8	12	119755	7.98
13	3/32	1/4	2	12	119766	8.18
14	7/64	5/16	2-1/8	12	119777	8.51
15	5/32	7/16	2-3/4	12	119788	13.62
16	3/16	1/2	3	12	119799	19.99
17	7/32	5/8	3-1/4	6	119810	38.50
18	1/4	3/4	3-1/2	6	119821	51.02

FOUR-FLUTE MACHINE COUNTERSINKS



60° • 82°
HIGH SPEED STEEL

SIZE	SHANK DIA.	OVERALL LENGTH	PKG. QTY.	60° - ITEM#	82° - ITEM#	LIST PRICE
1/2	1/2	3-7/8	1	113573	113628	60.08
5/8	1/2	4	1	113584	113639	67.65
3/4	1/2	4-1/8	1	113595	113650	86.31
7/8	1/2	4-1/4	1	113606	113661	101.47
1	1/2	4-3/8	1	113617	113672	104.85

SINGLE-FLUTE COUNTERSINKS



60° • 82° • 90°
HIGH SPEED STEEL

SIZE	SHANK DIA.	O.A.L.	PKG. QTY.	60° - ITEM#	LIST PRICE
1/4 - 60	3/16	1-7/16	1	113408	18.82
3/8 - 60	1/4	1-21/32	1	113419	21.44
1/2 - 60	1/4	1-13/32	1	113430	27.40
3/4 - 60	1/2	1-27/32	1	113441	37.83
1 - 60	1/2	2-13/16	1	113452	58.80

SIZE	SHANK DIA.	O.A.L.	PKG. QTY.	82° - ITEM#	LIST PRICE
1/4 - 82	3/16	1-7/16	1	113463	18.82
3/8 - 82	1/4	1-21/32	1	113474	21.44
1/2 - 82	1/4	1-13/32	1	113485	27.40
3/4 - 82	1/2	1-27/32	1	113496	37.83
1 - 82	1/2	2-13/16	1	113507	58.80

SIZE	SHANK DIA.	O.A.L.	PKG. QTY.	90° - ITEM#	LIST PRICE
1/4 - 90	3/16	1-7/16	1	113518	18.82
3/8 - 90	1/4	1-21/32	1	113529	21.44
1/2 - 90	1/4	1-13/32	1	113540	27.40
3/4 - 90	1/2	1-27/32	1	113551	37.83
1 - 90	1/2	2-13/16	1	113562	58.80

COUNTERSINKS

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



Spiral Point Taps

HIGH VANADIUM POWDERED METAL



SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIM	LIST PRICE
4 - 40	H2	2	1	213002	20.50	212793	23.57	213211	31.53
6 - 32	H3	2	1	213013	20.50	212804	23.57	213222	31.53
8 - 32	H3	3	1	213024	20.50	212815	23.57	213233	31.53
10 - 24	H3	3	1	213035	20.50	212826	23.57	213244	31.53
10 - 32	H3	3	1	213046	20.50	212837	23.57	213255	31.53
1/4 - 20	H3	3	1	213057	22.39	212848	25.75	213266	34.45
1/4 - 28	H3	3	1	213068	22.39	212859	25.75	213277	34.45
5/16 - 18	H3	3	1	213079	24.48	212870	28.15	213288	37.66
5/16 - 24	H3	3	1	213090	24.48	212881	28.15	213299	37.66
3/8 - 16	H3	3	1	213101	29.12	212892	33.49	213310	44.81
3/8 - 24	H3	3	1	213112	29.12	212903	33.49	213321	44.81
7/16 - 14	H3	4	1	213123	37.29	212914	42.88	213332	57.38
7/16 - 20	H3	4	1	213134	37.29	212925	42.88	213343	57.38
1/2 - 13	H3	4	1	213145	44.51	212936	51.19	213354	68.48
1/2 - 20	H3	4	1	213156	44.51	212947	51.19	213365	68.48
5/8 - 11	H3	4	1	213167	84.82	212958	97.55	213376	130.49
5/8 - 18	H3	4	1	213178	84.82	212969	97.55	213387	130.49
3/4 - 10	H3	4	1	213189	109.66	212980	126.12	213398	168.71
3/4 - 16	H3	4	1	213200	109.66	212991	126.12	213409	168.71

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

HIGH PERFORMANCE - SPIRAL POINT TAPS

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

Spiral Point Taps



HIGH VANADIUM POWDERED METAL METRIC



SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIN	LIST PRICE
M3 x 0.5	D3	2	1	214311	24.60	214388	28.30	214465	36.88
M4 x 0.7	D4	3	1	214322	24.60	214399	28.30	214476	36.88
M5 x 0.8	D4	3	1	214333	24.60	214410	28.30	214487	36.88
M6 x 1.0	D5	3	1	214344	27.02	214421	31.07	214498	40.53
M8 x 1.25	D5	3	1	214355	29.41	214432	33.82	214509	44.16
M10 x 1.5	D6	3	1	214366	34.91	214443	40.14	214520	51.95
M12 x 1.75	D6	3	1	214377	53.52	214454	61.54	214531	80.01
M14 x 2.0	D7	3	1	233858	81.58	233880	93.82	233902	110.06
M16 x 2.0	D7	3	1	233869	95.84	233891	110.22	233913	129.31

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



Spiral Flute Taps

HIGH VANADIUM POWDERED METAL

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



UNCOATED



STEAM OXIDE



ALTIN COATED

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIN	LIST PRICE
4 - 40	H2	3	1	213420	31.68	213838	36.44	213629	48.74
6 - 32	H3	3	1	213431	31.68	213849	36.44	213640	48.74
8 - 32	H3	3	1	213442	31.68	213860	36.44	213651	48.74
10 - 24	H3	3	1	213453	31.68	213871	36.44	213662	48.74
10 - 32	H3	3	1	213464	31.68	213882	36.44	213673	48.74
1/4 - 20	H3	3	1	213475	32.65	213893	37.55	213684	50.23
1/4 - 28	H3	3	1	213486	32.65	213904	37.55	213695	50.23
5/16 - 18	H3	3	1	213497	35.77	213915	41.13	213706	55.03
5/16 - 24	H3	3	1	213508	35.77	213926	41.13	213717	55.03
3/8 - 16	H3	3	1	213519	42.38	213937	48.74	213728	65.21
3/8 - 24	H3	3	1	213530	42.38	213948	48.74	213739	65.21
7/16 - 14	H3	4	1	213541	53.62	213959	61.66	213750	82.48
7/16 - 20	H3	4	1	213552	53.62	213970	61.66	213761	82.48
1/2 - 13	H3	4	1	213563	63.58	213981	73.12	213772	97.82
1/2 - 20	H3	4	1	213574	63.58	213992	73.12	213783	97.82
5/8 - 11	H3	4	1	213585	121.46	214003	139.68	213794	186.86
5/8 - 18	H3	4	1	213596	121.46	214014	139.68	213805	186.86
3/4 - 10	H3	4	1	213607	141.94	214025	163.24	213816	218.39
3/4 - 16	H3	4	1	213618	141.94	214036	163.24	213827	218.39

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

HIGH PERFORMANCE - SPIRAL FLUTE TAPS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

Spiral Flute Taps



HIGH VANADIUM POWDERED METAL METRIC

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



UNCOATED



STEAM OXIDE



ALTIN COATED

SIZE	D LIMIT	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	ALTIN	LIST PRICE
M3 x 0.5	D3	2	1	214542	38.04	214619	43.74	214696	56.11
M4 x 0.7	D4	3	1	214553	38.04	214630	43.74	214707	56.11
M5 x 0.8	D4	3	1	214564	38.04	214641	43.74	214718	56.11
M6 x 1.0	D5	3	1	214575	39.18	214652	45.05	214729	58.19
M8 x 1.25	D5	3	1	214586	43.02	214663	49.47	214740	64.42
M10 x 1.5	D6	3	1	214597	50.86	214674	58.50	214751	75.85
M12 x 1.75	D6	3	1	214608	76.32	214685	87.76	214762	114.30
M14 x 2.0	D7	3	1	233924	108.18	233946	124.40	233968	146.05
M16 x 2.0	D7	3	1	233935	126.56	233957	145.55	233979	170.86

- **CNC STYLE**
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HIGH PERFORMANCE - SPIRAL FLUTE TAPS

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



Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET - ITEM#	LIST PRICE
0 - 80	H1	2	1	199483	199505	199527	14.14	199549	42.43
0 - 80	H2	2	1	-	199560	199571	14.14	-	-
1 - 64	H1	2	1	199582	199604	199626	13.15	199648	39.45
1 - 64	H2	2	1	-	199659	-	13.15	-	-
1 - 72	H1	2	1	199670	199681	199692	13.15	199703	39.45
1 - 72	H2	2	1	-	199714	199725	13.15	-	-
2 - 56	H1	3	1	199736	199747	199758	12.17	199769	36.47
2 - 56	H2	2	1	-	199780	199791	12.17	-	-
2 - 56	H2	3	1	199802	199824	199846	11.32	199868	33.95
2 - 64	H2	3	1	199879	199901	199923	12.17	199945	36.47
3 - 48	H1	3	1	-	199956	-	9.89	-	-
3 - 48	H2	2	1	-	199967	199978	9.89	-	-
3 - 48	H2	3	1	199989	200011	200033	8.72	200055	26.13
3 - 56	H2	3	1	200066	200077	200088	9.78	200099	29.36
4 - 40	H1	2	1	-	200110	-	8.02	-	-
4 - 40	H1	3	1	200121	200132	200143	7.68	200154	23.05
4 - 40	H2	2	1	-	200165	200176	7.68	-	-
4 - 40	H2	3	1	200187	200209	200242	7.15	200275	21.44
4 - 48	H1	3	1	-	200286	-	8.02	-	-
4 - 48	H2	3	1	200297	200319	200352	7.68	200385	23.05
4 - 36	H2	3	1	200396	200418	200451	7.68	200484	23.05
5 - 40	H1	3	1	-	200495	200506	7.68	-	-
5 - 40	H2	2	1	-	200517	200528	7.68	-	-
5 - 40	H2	3	1	200539	200561	200594	7.15	200627	21.44
5 - 44	H2	2	1	-	200638	-	7.71	-	-
5 - 44	H2	3	1	200649	200671	200704	7.71	200737	23.12
6 - 32	H1	2	1	-	200748	-	6.76	-	-
6 - 32	H1	3	1	200759	200770	200781	6.76	200792	20.27
6 - 32	H2	2	1	-	200803	200814	6.76	-	-
6 - 32	H2	3	1	200825	200847	200880	5.82	200913	17.46
6 - 32	H3	2	1	-	200924	200935	5.82	-	-
6 - 32	H3	3	1	200946	200957	200968	5.48	200979	16.43
6 - 32	H7	3	1	-	200990	201001	6.76	-	-
6 - 40	H1	3	1	-	201012	-	6.76	-	-
6 - 40	H2	2	1	-	201023	-	6.76	-	-
6 - 40	H2	3	1	201034	201056	201089	5.82	201122	17.46
8 - 32	H1	2	1	-	201133	-	6.76	-	-
8 - 32	H1	3	1	-	201144	201155	6.76	-	-
8 - 32	H1	4	1	201166	201177	201188	6.76	201199	20.27
8 - 32	H2	2	1	-	201210	201221	6.76	-	-
8 - 32	H2	3	1	-	201232	201243	6.76	-	-
8 - 32	H2	4	1	201254	201265	201276	5.82	201287	17.46
8 - 32	H3	2	1	-	201298	201309	5.82	-	-
8 - 32	H3	3	1	-	201320	201331	5.82	-	-
8 - 32	H3	4	1	201342	201364	201397	5.61	201430	16.85
8 - 32	H7	3	1	-	201441	201452	6.76	-	-
8 - 32	H7	4	1	-	201463	201474	6.76	-	-
8 - 36	H1	4	1	-	201485	-	6.76	-	-
8 - 36	H2	4	1	201496	201518	201551	5.82	201584	17.46
10 - 24	H1	3	1	-	201595	-	6.76	-	-
10 - 24	H1	4	1	201606	201617	201628	5.99	201639	17.98
10 - 24	H2	2	1	-	201650	201661	6.76	-	-
10 - 24	H2	3	1	-	201672	-	6.76	-	-
10 - 24	H2	4	1	201683	201694	201705	5.99	201716	17.98
10 - 24	H3	2	1	-	201727	201738	5.99	-	-
10 - 24	H3	3	1	-	201749	201760	5.99	-	-
10 - 24	H3	4	1	201771	201793	201826	5.82	201859	17.46
10 - 24	H7	3	1	-	201870	201881	6.76	-	-
10 - 24	H7	4	1	-	201892	201903	6.76	-	-

FOR GENERAL DIMENSIONS SEE PAGE 108

Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET - ITEM#	LIST PRICE
10 - 32	H1	2	1	-	201914	201925	6.76	-	-
10 - 32	H1	3	1	-	201936	-	6.76	-	-
10 - 32	H1	4	1	201947	201958	201969	5.99	201980	17.98
10 - 32	H2	2	1	-	201991	202002	6.76	-	-
10 - 32	H2	3	1	-	202013	202024	6.76	-	-
10 - 32	H2	4	1	202035	202046	202057	5.99	202068	17.98
10 - 32	H3	2	1	-	202079	202090	5.99	-	-
10 - 32	H3	3	1	-	202101	202112	5.99	-	-
10 - 32	H3	4	1	202123	202145	202178	5.82	202211	17.46
10 - 32	H7	3	1	-	202222	202233	6.76	-	-
10 - 32	H7	4	1	-	202244	202255	6.76	-	-
12 - 24	H3	4	1	202266	202288	202321	6.14	202354	18.41
12 - 28	H1	4	1	-	202365	-	7.14	-	-
12 - 28	H3	4	1	202376	202398	202431	6.76	202464	20.27
1/4 - 20	H1	3	1	-	202475	-	7.82	-	-
1/4 - 20	H1	4	1	202486	202497	202508	7.82	202519	23.44
1/4 - 20	H2	3	1	-	202530	-	7.82	-	-
1/4 - 20	H2	4	1	202541	202552	202563	7.44	202574	22.33
1/4 - 20	H3	2	1	-	202585	202596	7.82	-	-
1/4 - 20	H3	3	1	-	202607	202618	7.44	-	-
1/4 - 20	H3	4	1	202629	202651	202684	6.25	202717	18.75
1/4 - 20	H5	3	1	-	202728	202739	7.82	-	-
1/4 - 20	H5	4	1	-	202750	202761	7.44	-	-
1/4 - 28	H1	4	1	-	202772	202783	7.44	-	-
1/4 - 28	H2	4	1	-	202794	202805	7.82	-	-
1/4 - 28	H3	2	1	-	202816	202827	7.82	-	-
1/4 - 28	H3	3	1	-	202838	202849	7.82	-	-
1/4 - 28	H3	4	1	202860	202882	202915	6.25	202948	18.75
1/4 - 28	H4	4	1	-	202959	202970	7.82	-	-
5/16 - 18	H1	4	1	202981	202992	203003	8.67	-	-
5/16 - 18	H2	4	1	203014	203025	203036	8.67	203047	25.98
5/16 - 18	H3	2	1	-	203058	203069	9.74	-	-
5/16 - 18	H3	3	1	-	203080	203091	8.67	-	-
5/16 - 18	H3	4	1	203102	203124	203157	7.70	203190	23.10
5/16 - 18	H5	3	1	-	203201	203212	9.74	-	-
5/16 - 18	H5	4	1	-	203223	203234	8.67	-	-
5/16 - 24	H1	4	1	203245	203256	203267	8.67	-	-
5/16 - 24	H2	4	1	-	203278	203289	8.67	-	-
5/16 - 24	H3	3	1	-	203300	203311	8.67	-	-
5/16 - 24	H3	4	1	203322	203344	203377	7.70	203410	23.10
5/16 - 24	H4	4	1	-	203421	203432	8.67	-	-
3/8 - 16	H1	3	1	-	203443	-	11.09	-	-
3/8 - 16	H1	4	1	-	203454	203465	11.09	-	-
3/8 - 16	H2	4	1	203476	203487	203498	9.74	203509	29.22
3/8 - 16	H3	3	1	-	203520	203531	9.74	-	-
3/8 - 16	H3	4	1	203542	203564	203597	8.69	203630	26.06
3/8 - 16	H5	3	1	-	203641	203652	11.09	-	-
3/8 - 16	H5	4	1	-	203663	203674	9.74	-	-
3/8 - 24	H1	4	1	203685	203696	203707	11.09	-	-
3/8 - 24	H2	4	1	-	203718	203729	9.74	-	-
3/8 - 24	H3	3	1	-	203740	203751	11.09	-	-
3/8 - 24	H3	4	1	203762	203784	203817	8.69	203850	26.06
3/8 - 24	H4	4	1	-	203861	203872	9.74	-	-
7/16 - 14	H1	4	1	-	203883	203894	16.42	-	-
7/16 - 14	H2	4	1	-	203905	203916	16.42	-	-
7/16 - 14	H3	3	1	-	203927	-	16.42	-	-
7/16 - 14	H3	4	1	203938	203960	203993	14.94	204026	44.81
7/16 - 14	H5	4	1	-	204037	204048	16.42	-	-
7/16 - 20	H1	4	1	-	204059	204070	16.42	-	-

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

HAND TAPS

CARRIDE ENDMILLS

CARRIDE MICRO ENDMILLS

CARRIDE THREADMILLS

CARRIDE DRILL MILLS

CARRIDE DRILLS

CARRIDE REAMERS

CARRIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Hand Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
7/16 - 20	H2	4	1	-	204081	204092	16.42	-	-
7/16 - 20	H3	3	1	-	204103	-	16.42	-	-
7/16 - 20	H3	4	1	204114	204136	204169	14.94	204202	44.81
7/16 - 20	H5	4	1	-	204213	204224	16.42	-	-
1/2 - 13	H1	4	1	-	204235	204246	19.15	-	-
1/2 - 13	H2	4	1	-	204257	204268	19.15	-	-
1/2 - 13	H3	3	1	-	204279	204290	19.15	-	-
1/2 - 13	H3	4	1	204301	204323	204356	15.57	204389	46.72
1/2 - 13	H5	4	1	-	204400	204411	19.44	-	-
1/2 - 20	H1	4	1	204422	204433	204444	19.15	-	-
1/2 - 20	H2	4	1	-	204455	204466	19.15	-	-
1/2 - 20	H3	3	1	-	204477	-	19.15	-	-
1/2 - 20	H3	4	1	204488	204510	204543	17.60	204576	52.80
1/2 - 20	H5	4	1	-	204587	204598	19.15	-	-
9/16 - 12	H2	4	1	-	204609	-	28.46	-	-
9/16 - 12	H3	4	1	204620	204642	204675	26.11	204708	78.40
9/16 - 12	H5	4	1	-	204719	204730	28.46	-	-
9/16 - 18	H2	4	1	-	204741	-	28.46	-	-
9/16 - 18	H3	4	1	204752	204774	204807	26.11	204840	78.40
9/16 - 18	H5	4	1	-	204851	204862	28.46	-	-
5/8 - 11	H1	4	1	-	204873	-	36.06	-	-
5/8 - 11	H2	4	1	-	204884	-	36.06	-	-
5/8 - 11	H3	4	1	204895	204917	204950	31.36	204983	94.04
5/8 - 11	H5	4	1	-	204994	205005	36.06	-	-
5/8 - 18	H1	4	1	-	205016	-	36.06	-	-
5/8 - 18	H2	4	1	-	205027	205038	36.06	-	-
5/8 - 18	H3	4	1	205049	205071	205104	31.36	205137	94.04
5/8 - 18	H5	4	1	-	205148	205159	36.06	-	-
11/16 - 11	H3	4	1	205170	205192	205225	38.94	205258	116.83
11/16 - 16	H3	4	1	205269	205291	205324	38.94	205357	116.83
3/4 - 10	H1	4	1	-	205368	-	47.40	-	-
3/4 - 10	H2	4	1	-	205379	-	47.40	-	-
3/4 - 10	H3	4	1	205390	205412	205445	43.89	205478	131.60
3/4 - 10	H5	4	1	-	205489	205500	47.40	-	-
3/4 - 16	H1	4	1	-	205511	-	47.40	-	-
3/4 - 16	H2	4	1	-	205522	-	47.40	-	-
3/4 - 16	H3	4	1	205533	205555	205588	43.89	205621	131.60
3/4 - 16	H5	4	1	-	205632	205643	47.40	-	-
7/8 - 9	H2	4	1	-	205654	-	64.22	-	-
7/8 - 9	H4	4	1	205665	205687	205720	61.17	205753	183.48
7/8 - 9	H6	4	1	-	205764	-	64.22	-	-
7/8 - 14	H2	4	1	-	205775	-	64.22	-	-
7/8 - 14	H4	4	1	205786	205808	205841	61.17	205874	183.48
7/8 - 14	H6	4	1	-	205885	-	64.22	-	-
1 - 8	H2	4	1	-	205896	-	83.75	-	-
1 - 8	H4	4	1	205907	205929	205962	81.31	205995	243.96
1 - 8	H6	4	1	-	206006	-	83.75	-	-
1 - 12	H4	4	1	206017	206039	206072	81.31	206105	243.96
1 - 14	H2	4	1	-	206116	-	83.75	-	-
1 - 14	H4	4	1	206127	206149	206182	81.31	206215	243.96
1 - 14	H6	4	1	206226	206237	206248	83.75	-	-
1-1/8 - 7	H4	4	1	206259	206281	206314	131.60	206347	394.80
1-1/8 - 12	H4	4	1	206358	206380	206413	139.40	206446	418.16
1-1/4 - 7	H4	4	1	206457	206479	206512	172.74	206545	518.21
1-1/4 - 12	H4	6	1	206556	206578	206611	175.75	206644	527.25
1-3/8 - 6	H4	4	1	206655	206677	206710	217.04	206743	651.10
1-3/8 - 12	H4	6	1	206754	206776	206809	218.57	206842	655.70
1-1/2 - 6	H4	4	1	206853	206875	206908	250.64	206941	751.92
1-1/2 - 12	H4	6	1	206952	206974	207007	255.25	207040	765.73

FOR GENERAL DIMENSIONS SEE PAGE 108



Hand Taps

STEAM OXIDE



HIGH SPEED STEEL

NITRIDE & STEAM OXIDE



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	STEAM OXIDE				NITRIDE & STEAM OXIDE		
				TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0 - 80	H1	2	1	199494	199516	199538	16.28	-	-	-
1 - 64	H1	2	1	199593	199615	199637	15.14	-	-	-
2 - 56	H2	3	1	199813	199835	199857	13.04	-	-	-
2 - 64	H2	3	1	199890	199912	199934	14.01	-	-	-
3 - 48	H2	3	1	200000	200022	200044	10.03	-	-	-
4 - 40	H2	3	1	200198	200231	200264	8.23	200220	200253	8.23
4 - 48	H2	3	1	200308	200341	200374	8.85	200330	200363	8.85
4 - 36	H2	3	1	200407	200440	200473	8.85	200429	200462	8.85
5 - 40	H2	3	1	200550	200583	200616	8.23	200572	200605	8.23
5 - 44	H2	3	1	200660	200693	200726	8.88	200682	200715	8.88
6 - 32	H2	3	1	200836	200869	200902	6.70	200858	200891	6.70
6 - 40	H2	3	1	201045	201078	201111	6.70	201067	201100	6.70
8 - 32	H3	4	1	201353	201386	201419	6.47	201375	201408	6.47
8 - 36	H2	4	1	201507	201540	201573	6.70	201529	201562	6.70
10 - 24	H3	4	1	201782	201815	201848	6.70	201804	201837	6.70
10 - 32	H3	4	1	202134	202167	202200	6.71	202156	202189	6.71
12 - 24	H3	4	1	202277	202310	202343	7.07	202299	202332	7.07
12 - 28	H3	4	1	202387	202420	202453	7.78	202409	202442	7.78
1/4 - 20	H3	4	1	202640	202673	202706	7.19	202662	202695	7.19
1/4 - 28	H3	4	1	202871	202904	202937	7.19	202893	202926	7.19
5/16 - 18	H3	4	1	203113	203146	203179	8.86	203135	203168	8.86
5/16 - 24	H3	4	1	203333	203366	203399	8.86	203355	203388	8.86
3/8 - 16	H3	4	1	203553	203586	203619	10.00	203575	203608	10.00
3/8 - 24	H3	4	1	203773	203806	203839	10.00	203795	203828	10.00
7/16 - 14	H3	4	1	203949	203982	204015	17.19	203971	204004	17.19
7/16 - 20	H3	4	1	204125	204158	204191	17.19	204147	204180	17.19
1/2 - 13	H3	4	1	204312	204345	204378	17.92	204334	204367	17.92
1/2 - 20	H3	4	1	204499	204532	204565	20.27	204521	204554	20.27
9/16 - 12	H3	4	1	204631	204664	204697	30.02	204653	204686	30.02
9/16 - 18	H3	4	1	204763	204796	204829	30.02	204785	204818	30.02
5/8 - 11	H3	4	1	204906	204939	204972	36.07	204928	204961	36.07
5/8 - 18	H3	4	1	205060	205093	205126	36.07	205082	205115	36.07
11/16 - 11	H3	4	1	205181	205214	205247	44.78	205203	205236	44.78
11/16 - 16	H3	4	1	205280	205313	205346	44.78	205302	205335	44.78
3/4 - 10	H3	4	1	205401	205434	205467	50.47	205423	205456	50.47
3/4 - 16	H3	4	1	205544	205577	205610	50.47	205566	205599	50.47
7/8 - 9	H4	4	1	205676	205709	205742	70.35	205698	205731	70.35
7/8 - 14	H4	4	1	205797	205830	205863	70.35	205819	205852	70.35
1 - 8	H4	4	1	205918	205951	205984	93.45	205940	205973	93.45
1 - 12	H4	4	1	206028	206061	206094	93.45	206050	206083	93.45
1 - 14	H4	4	1	206138	206171	206204	93.45	206160	206193	93.45
1-1/8 - 7	H4	4	1	206270	206303	206336	151.34	206292	206325	151.34
1-1/8 - 12	H4	4	1	206369	206402	206435	160.30	206391	206424	160.30
1-1/4 - 7	H4	4	1	206468	206501	206534	198.65	206490	206523	198.65
1-1/4 - 12	H4	6	1	206567	206600	206633	202.12	206589	206622	202.12
1-3/8 - 6	H4	4	1	206666	206699	206732	249.59	206688	206721	249.59
1-3/8 - 12	H4	6	1	206765	206798	206831	251.35	206787	206820	251.35
1-1/2 - 6	H4	4	1	206864	206897	206930	288.24	206886	206919	288.24
1-1/2 - 12	H4	6	1	206963	206996	207029	293.53	206985	207018	293.53

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

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

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

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

FOR GENERAL DIMENSIONS SEE PAGE 108

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



Hand Taps



**HIGH SPEED STEEL
TIN COATED**

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	24.04	240527	72.12
2 - 56	H2	3	1	240538	240549	240560	19.25	240571	57.72
4 - 40	H2	3	1	240582	240593	240604	12.16	240615	36.45
5 - 40	H2	3	1	240626	240637	240648	12.16	240659	36.45
6 - 32	H3	3	1	240670	240681	240692	9.32	240703	27.93
8 - 32	H3	4	1	240714	240725	240736	9.54	240747	28.65
10 - 24	H3	4	1	240758	240769	240780	9.89	240791	29.69
10 - 32	H3	4	1	240802	240813	240824	9.89	240835	29.69
12 - 24	H3	4	1	240846	240857	240868	10.43	240879	31.31
12 - 28	H3	4	1	240890	240901	240912	11.50	240923	34.46
1/4 - 20	H3	4	1	240934	240945	240956	10.62	240967	31.89
1/4 - 28	H3	4	1	240978	240989	241000	10.62	241011	31.89
5/16 - 18	H3	4	1	241022	241033	241044	13.09	241055	39.27
5/16 - 24	H3	4	1	241066	241077	241088	13.09	241099	39.27
3/8 - 16	H3	4	1	241110	241121	241132	14.77	241143	44.30
3/8 - 24	H3	4	1	241154	241165	241176	14.77	241187	44.30
7/16 - 14	H3	4	1	241198	241209	241220	25.39	241231	76.18
7/16 - 20	H3	4	1	241242	241253	241264	25.39	241275	76.18
1/2 - 13	H3	4	1	241286	241297	241308	26.47	241319	79.42
1/2 - 20	H3	4	1	241330	241341	241352	29.92	241363	89.76
5/8 - 11	H3	4	1	241374	241385	241396	53.32	241407	159.86
5/8 - 18	H3	4	1	241418	241429	241440	53.32	241451	159.86
3/4 - 10	H3	4	1	241462	241473	241484	74.61	241495	223.72
3/4 - 16	H3	4	1	241506	241517	241528	74.61	241539	223.72



ALL TOOLS ARE 100% MADE IN THE USA

FOR GENERAL DIMENSIONS SEE PAGE 108

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

HAND TAPS



Hand Taps



**HIGH SPEED STEEL
METRIC
UNCOATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	1	-	210791	-	18.89	-	-
M2 x 0.4	D3	3	1	210802	210813	210824	18.89	211594	56.68
M2.5 x 0.45	D3	3	1	-	210835	-	11.62	-	-
M3 x 0.5	D3	3	1	210846	210857	210868	9.69	211605	29.08
M3.5 x 0.6	D4	3	1	-	210879	-	8.01	-	-
M4 x 0.7	D4	4	1	210890	210901	210912	8.01	211616	24.02
M4.5 x 0.75	D4	4	1	-	210923	-	8.01	-	-
M5 x 0.8	D4	4	1	210934	210945	210956	8.01	211627	24.02
M6 x 1.0	D5	4	1	210967	210978	210989	8.46	211638	25.36
M7 x 1.0	D5	4	1	211000	211011	211022	8.47	211649	25.38
M8 x 1.25	D5	4	1	211033	211044	211055	8.47	211660	25.38
M10 x 1.25	D5	4	1	211066	211077	211088	17.37	211671	52.10
M10 x 1.50	D6	4	1	211099	211110	211121	17.37	211682	52.10
M12 x 1.25	D5	4	1	211132	211143	211154	20.36	211693	61.10
M12 x 1.75	D6	4	1	211165	211176	211187	20.36	211704	61.10
M14 x 1.5	D6	4	1	211198	211209	211220	30.45	211715	91.35
M14 x 2.0	D7	4	1	211231	211242	211253	30.45	211726	91.35
M16 x 1.5	D6	4	1	211264	211275	211286	37.11	211737	111.32
M16 x 2.0	D7	4	1	211297	211308	211319	37.11	211748	111.32
M18 x 1.5	D6	4	1	211330	211341	211352	49.97	211759	149.91
M18 x 2.5	D7	4	1	211363	211374	211385	49.97	211770	149.91
M20 x 2.5	D7	4	1	211396	211407	211418	64.63	211781	193.90
M24 x 3.0	D8	4	1	211429	211440	211451	94.58	211792	283.73
M27 x 3.0	D8	4	1	211462	211473	211484	163.47	211803	490.42
M30 x 3.5	D9	4	1	211495	211506	211517	208.77	211814	626.30
M33 x 3.5	D9	4	1	211528	211539	211550	208.21	211825	624.65
M36 x 4.0	D9	4	1	211561	211572	211583	264.07	211836	792.20



**HIGH SPEED STEEL
METRIC
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET-ITEM#	LIST PRICE
M1.6 x 0.35	D3	2	1	-	243486	-	32.12	-	-
M2 x 0.4	D3	3	1	243497	243508	243519	32.12	244289	96.36
M2.5 x 0.45	D3	3	1	-	243530	-	19.76	-	-
M3 x 0.5	D3	3	1	243541	243552	243563	16.48	244300	49.44
M3.5 x 0.6	D4	3	1	-	243574	-	13.61	-	-
M4 x 0.7	D4	4	1	243585	243596	243607	13.61	244311	40.84
M4.5 x 0.75	D4	4	1	-	243618	-	13.61	-	-
M5 x 0.8	D4	4	1	243629	243640	243651	13.61	244322	40.84
M6 x 1.0	D5	4	1	243662	243673	243684	14.38	244333	43.11
M7 x 1.0	D5	4	1	243695	243706	243717	14.40	244344	43.15
M8 x 1.25	D5	4	1	243728	243739	243750	14.40	244355	43.15
M10 x 1.25	D5	4	1	243761	243772	243783	29.52	244366	88.57
M10 x 1.50	D6	4	1	243794	243805	243816	29.52	244377	88.57
M12 x 1.25	D5	4	1	243827	243838	243849	34.62	244388	103.86
M12 x 1.75	D6	4	1	243860	243871	243882	34.62	244399	103.86
M14 x 1.5	D6	4	1	243893	243904	243915	51.76	244410	155.30
M14 x 2.0	D7	4	1	243926	243937	243948	51.76	244421	155.30
M16 x 1.5	D6	4	1	243959	243970	243981	63.09	244432	189.25
M16 x 2.0	D7	4	1	243992	244003	244014	63.09	244443	189.25
M18 x 1.5	D6	4	1	244025	244036	244047	84.95	244454	254.84
M18 x 2.5	D7	4	1	244058	244069	244080	84.95	244465	254.84
M20 x 2.5	D7	4	1	244091	244102	244113	109.87	244476	329.63
M24 x 3.0	D8	4	1	244124	244135	244146	160.79	244487	482.35
M27 x 3.0	D8	4	1	244157	244168	244179	277.91	244498	833.72
M30 x 3.5	D9	4	1	244190	244201	244212	354.90	244509	1064.71
M33 x 3.5	D9	4	1	244223	244234	244245	353.97	244520	1061.90
M36 x 4.0	D9	4	1	244256	244267	244278	448.91	244531	1346.74

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



Spiral Point Plug Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H1	2	1	207161	17.43
0 - 80	H2	2	1	207172	17.43
1 - 64	H1	2	1	207194	15.75
1 - 64	H2	2	1	207205	15.75
1 - 72	H1	2	1	207227	15.75
1 - 72	H2	2	1	207238	15.75
2 - 56	H1	2	1	207260	14.97
2 - 56	H2	2	1	207271	13.37
2 - 64	H1	2	1	207293	14.97
2 - 64	H2	2	1	207304	14.97
3 - 48	H1	2	1	207326	10.72
3 - 48	H2	2	1	207337	10.72
3 - 56	H1	2	1	207359	13.14
3 - 56	H2	2	1	207370	11.93
4 - 40	H1	2	1	207392	9.81
4 - 40	H2	2	1	207403	8.60
4 - 48	H1	2	1	207436	9.97
4 - 48	H2	2	1	207447	9.81
4 - 36	H2	2	1	207480	9.81
5 - 40	H1	2	1	207513	9.81
5 - 40	H2	2	1	207524	8.60
5 - 44	H2	2	1	207557	9.81
6 - 32	H1	2	1	207590	8.60
6 - 32	H2	2	1	207601	7.24
6 - 32	H3	2	1	207612	7.24
6 - 32	H7	2	1	207645	8.21
6 - 40	H1	2	1	207656	8.21
6 - 40	H2	2	1	207667	8.21
8 - 32	H1	2	1	207700	8.21
8 - 32	H2	2	1	207711	7.24
8 - 32	H3	2	1	207722	7.24
8 - 32	H7	2	1	207755	8.21
8 - 36	H1	2	1	207766	8.21
8 - 36	H2	2	1	207777	8.21
10 - 24	H1	2	1	207810	8.97
10 - 24	H2	2	1	207821	8.21
10 - 24	H3	2	1	207832	7.24
10 - 24	H7	2	1	207865	8.97
10 - 32	H1	2	1	207876	8.21
10 - 32	H2	2	1	207887	7.24
10 - 32	H3	2	1	207898	7.24
10 - 32	H7	2	1	207931	8.97
12 - 24	H1	2	1	207942	8.21
12 - 24	H3	2	1	207953	8.21
12 - 28	H3	2	1	207986	8.21
1/4 - 20	H1	2	1	207997	8.21
1/4 - 20	H2	2	1	208008	8.21
1/4 - 20	H3	2	1	208019	7.24
1/4 - 20	H3	3	1	208052	8.97
1/4 - 20	H5	2	1	208063	8.19

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/4 - 20	H5	3	1	208074	8.97
1/4 - 28	H1	2	1	208085	8.97
1/4 - 28	H2	2	1	208096	8.19
1/4 - 28	H2	3	1	208107	8.97
1/4 - 28	H3	2	1	208118	7.24
1/4 - 28	H4	2	1	208151	8.97
1/4 - 28	H4	3	1	208162	8.97
5/16 - 18	H1	2	1	208173	10.32
5/16 - 18	H2	2	1	208184	8.97
5/16 - 18	H3	2	1	208195	7.82
5/16 - 18	H3	3	1	208228	10.32
5/16 - 18	H5	2	1	208239	8.97
5/16 - 18	H5	3	1	208250	10.32
5/16 - 24	H1	2	1	208261	10.32
5/16 - 24	H2	2	1	208272	10.32
5/16 - 24	H2	3	1	208283	10.32
5/16 - 24	H3	2	1	208294	7.82
5/16 - 24	H4	2	1	208327	10.32
5/16 - 24	H4	3	1	208338	10.32
3/8 - 16	H1	3	1	208349	11.57
3/8 - 16	H2	3	1	208360	10.74
3/8 - 16	H3	3	1	208371	9.27
3/8 - 16	H5	3	1	208404	11.67
3/8 - 24	H1	3	1	208415	11.75
3/8 - 24	H2	3	1	208426	11.75
3/8 - 24	H3	3	1	208437	9.96
3/8 - 24	H4	3	1	208470	11.75
7/16 - 14	H2	3	1	208481	17.17
7/16 - 14	H3	3	1	208492	15.75
7/16 - 14	H5	3	1	208525	17.17
7/16 - 20	H2	3	1	208536	17.17
7/16 - 20	H3	3	1	208547	15.75
7/16 - 20	H5	3	1	208580	17.17
1/2 - 13	H1	3	1	208591	21.02
1/2 - 13	H2	3	1	208602	21.02
1/2 - 13	H3	3	1	208613	16.04
1/2 - 13	H5	3	1	208646	18.93
1/2 - 20	H1	3	1	208657	21.02
1/2 - 20	H2	3	1	208668	21.02
1/2 - 20	H3	3	1	208679	18.85
1/2 - 20	H5	3	1	208712	21.02
9/16 - 12	H3	3	1	208723	26.20
9/16 - 18	H3	3	1	208756	26.20
5/8 - 11	H3	3	1	208789	35.78
5/8 - 11	H5	3	1	208822	35.78
5/8 - 18	H3	3	1	208833	35.78
3/4 - 10	H3	3	1	208866	50.46
3/4 - 10	H5	3	1	208899	50.46
3/4 - 16	H3	3	1	208910	50.46
-	-	-	-	-	-

FOR GENERAL DIMENSIONS SEE PAGE 108

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

SPIRAL POINT PLUG TAPS

Spiral Point Plug Taps



STEAM OXIDE



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0 - 80	H2	2	1	207183	20.07
1 - 64	H2	2	1	207216	18.13
1 - 72	H2	2	1	207249	18.13
2 - 56	H2	2	1	207282	15.40
2 - 64	H2	2	1	207315	17.24
3 - 48	H2	2	1	207348	12.34
3 - 56	H2	2	1	207381	13.75
4 - 40	H2	2	1	207425	9.91
4 - 48	H2	2	1	207469	11.29
4 - 36	H2	2	1	207502	11.29
5 - 40	H2	2	1	207546	9.91
5 - 44	H2	2	1	207579	11.29
6 - 32	H3	2	1	207634	8.33
6 - 40	H2	2	1	207689	9.47
8 - 32	H3	2	1	207744	8.33
8 - 36	H2	2	1	207799	9.47
10 - 24	H3	2	1	207854	8.33
10 - 32	H3	2	1	207920	8.33
12 - 24	H3	2	1	207975	9.47
1/4 - 20	H3	2	1	208041	8.33
1/4 - 28	H3	2	1	208140	8.33
5/16 - 18	H3	2	1	208217	9.00
5/16 - 24	H3	2	1	208316	9.00
3/8 - 16	H3	3	1	208393	10.68
3/8 - 24	H3	3	1	208459	11.46
7/16 - 14	H3	3	1	208514	18.13
7/16 - 20	H3	3	1	208569	18.13
1/2 - 13	H3	3	1	208635	18.47
1/2 - 20	H3	3	1	208701	21.69
9/16 - 12	H3	3	1	208745	30.13
9/16 - 18	H3	3	1	208778	30.13
5/8 - 11	H3	3	1	208811	41.15
5/8 - 18	H3	3	1	208855	41.15
3/4 - 10	H3	3	1	208888	58.03
3/4 - 16	H3	3	1	208932	58.03

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



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H2	2	1	207414	9.91
4 - 48	H2	2	1	207458	11.29
4 - 36	H2	2	1	207491	11.29
5 - 40	H2	2	1	207535	9.91
5 - 44	H2	2	1	207568	11.29
6 - 32	H3	2	1	207623	8.33
6 - 40	H2	2	1	207678	9.47
8 - 32	H3	2	1	207733	8.33
8 - 36	H2	2	1	207788	9.47
10 - 24	H3	2	1	207843	8.33
10 - 32	H3	2	1	207909	8.33
12 - 24	H3	2	1	207964	9.47
1/4 - 20	H3	2	1	208030	8.33
1/4 - 28	H3	2	1	208129	8.33
5/16 - 18	H3	2	1	208206	9.00
5/16 - 24	H3	2	1	208305	9.00
3/8 - 16	H3	3	1	208382	10.68
3/8 - 24	H3	3	1	208448	11.46
7/16 - 14	H3	3	1	208503	18.13
7/16 - 20	H3	3	1	208558	18.13
1/2 - 13	H3	3	1	208624	18.47
1/2 - 20	H3	3	1	208690	21.69
9/16 - 12	H3	3	1	208734	30.13
9/16 - 18	H3	3	1	208767	30.13
5/8 - 11	H3	3	1	208800	41.15
5/8 - 18	H3	3	1	208844	41.15
3/4 - 10	H3	3	1	208877	58.03
3/4 - 16	H3	3	1	208921	58.03

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).

SPIRAL POINT PLUG TAPS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA



Spiral Point Plug Taps



**HIGH SPEED STEEL
TIN COATED**



**HIGH SPEED STEEL
ALTIN COATED**

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
0-80	H2	2	1	214773	24.35
2-56	H2	2	1	214784	19.53
4-40	H2	2	1	214795	13.80
5-40	H2	2	1	214806	13.80
6-32	H3	2	1	214817	12.92
8-32	H3	2	1	214828	12.92
10-24	H3	2	1	214839	12.92
10-32	H3	2	1	214850	12.92
12-24	H3	2	1	214861	14.10
12-28	H3	2	1	214872	14.10
1/4-20	H3	2	1	214883	12.92
1/4-28	H3	2	1	214894	12.92
5/16-18	H3	2	1	214905	14.13
5/16-24	H3	2	1	214916	14.13
3/8-16	H3	3	1	214927	16.58
3/8-24	H3	3	1	214938	17.42
7/16-14	H3	3	1	214949	27.43
7/16-20	H3	3	1	214960	27.43
1/2-13	H3	3	1	214971	27.79
1/2-20	H3	3	1	214982	31.03
5/8-11	H3	3	1	214993	64.23
5/8-18	H3	3	1	215004	64.23
3/4-10	H3	3	1	215015	83.87
3/4-16	H3	3	1	215026	83.87

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	24.35
2-56	H2	2	1	214058	19.53
4-40	H2	2	1	214069	13.80
5-40	H2	2	1	214080	13.80
6-32	H3	2	1	214091	12.92
8-32	H3	2	1	214102	12.92
10-24	H3	2	1	214113	12.92
10-32	H3	2	1	214124	12.92
12-24	H3	2	1	214135	14.10
12-28	H3	2	1	214146	14.10
1/4-20	H3	2	1	214157	12.92
1/4-28	H3	2	1	214168	12.92
5/16-18	H3	2	1	214179	14.13
5/16-24	H3	2	1	214190	14.13
3/8-16	H3	3	1	214201	16.58
3/8-24	H3	3	1	214212	17.42
7/16-14	H3	3	1	214223	27.43
7/16-20	H3	3	1	214234	27.43
1/2-13	H3	3	1	214245	27.79
1/2-20	H3	3	1	214256	31.03
5/8-11	H3	3	1	214267	64.23
5/8-18	H3	3	1	214278	64.23
3/4-10	H3	3	1	214289	83.87
3/4-16	H3	3	1	214300	83.87

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 GENERAL DIMENSIONS SEE PAGE 108

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

SPIRAL POINT PLUG TAPS



Spiral Point Plug Taps



**HIGH SPEED STEEL
METRIC
UNCOATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	211847	19.32
M2.5 x 0.45	D3	2	1	211858	13.84
M3 x 0.5	D3	2	1	211869	11.13
M3.5 x 0.6	D4	2	1	211880	9.61
M4 x 0.7	D4	2	1	211891	9.61
M4.5 x 0.75	D4	2	1	211902	9.61
M5 x 0.8	D4	2	1	211913	9.61
M6 x 1.0	D5	2	1	211924	9.61
M7 x 1.0	D5	2	1	211935	11.09
M8 x 1.25	D5	2	1	211946	11.09
M10 x 1.50	D6	3	1	211957	18.42
M12 x 1.75	D6	3	1	211968	23.06
M14 x 2.0	D7	3	1	211979	35.79
M16 x 2.0	D7	3	1	211990	40.56
M18 x 2.5	D7	3	1	212001	59.65
M20 x 2.5	D7	4	1	212012	78.74



**HIGH SPEED STEEL
METRIC
TIN COATED**

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	233220	25.11
M2.5 x 0.45	D3	2	1	233231	17.99
M3 x 0.5	D3	2	1	233242	14.48
M3.5 x 0.6	D4	2	1	233253	12.48
M4 x 0.7	D4	2	1	233264	12.48
M4.5 x 0.75	D4	2	1	233275	12.48
M5 x 0.8	D4	2	1	233286	12.48
M6 x 1.0	D5	2	1	233297	12.48
M7 x 1.0	D5	2	1	233308	14.41
M8 x 1.25	D5	2	1	233319	14.41
M10 x 1.50	D6	3	1	233330	23.95
M12 x 1.75	D6	3	1	233341	29.99
M14 x 2.0	D7	3	1	233352	46.53
M16 x 2.0	D7	3	1	233363	52.73
M18 x 2.5	D7	3	1	233374	77.54
M20 x 2.5	D7	4	1	233385	102.36

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

SPiral POINT PLUG TAPS
 COUNTERSINKS
 CARBIDE BURS
 CARBIDE REAMERS
 CARBIDE DRILLS
 CARBIDE DRILL MILLS
 CARBIDE THREADMILLS
 CARBIDE MICRO ENDMILLS
 CARBIDE ENDMILLS
 HSS & COBALT REAMERS
 HSS & COBALT ENDMILLS
 HSS & COBALT DRILLS



Gold Oxide Taps

HAND TAPS



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	TAPER ITEM#	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE	SET ITEM#	LIST PRICE
0 - 80	H1	2	1	236600	236611	236622	16.28	236633	48.84
1 - 64	H1	2	1	236644	236655	236666	15.14	236677	45.42
2 - 56	H2	3	1	236688	236699	236710	13.04	236721	39.10
2 - 64	H2	3	1	236732	236743	236754	14.01	236765	42.03
3 - 48	H2	3	1	236776	236787	236798	10.03	236809	30.11
4 - 40	H2	3	1	236820	236831	236842	8.23	236853	24.69
4 - 48	H2	3	1	236864	236875	236886	8.85	236897	26.55
4 - 36	H2	3	1	236908	236919	236930	8.85	236941	26.55
5 - 40	H2	3	1	236952	236963	236974	8.23	236985	24.69
5 - 44	H2	3	1	236996	237007	237018	8.88	237029	26.63
6 - 32	H2	3	1	237040	237051	237062	6.70	237073	20.10
6 - 40	H2	3	1	237084	237095	237106	6.70	237117	20.10
8 - 32	H3	4	1	237128	237139	237150	6.47	237161	19.40
8 - 36	H2	4	1	237172	237183	237194	6.70	237205	20.10
10 - 24	H3	4	1	237216	237227	237238	6.70	237249	20.10
10 - 32	H3	4	1	237260	237271	237282	6.71	237293	20.12
12 - 24	H3	4	1	237304	237315	237326	7.07	237337	21.22
12 - 28	H3	4	1	237348	237359	237370	7.78	237381	23.35
1/4 - 20	H3	4	1	237392	237403	237414	7.19	237425	21.58
1/4 - 28	H3	4	1	237436	237447	237458	7.19	237469	21.58
5/16 - 18	H3	4	1	237480	237491	237502	8.86	237513	26.58
5/16 - 24	H3	4	1	237524	237535	237546	8.86	237557	26.58
3/8 - 16	H3	4	1	237568	237579	237590	10.00	237601	29.99
3/8 - 24	H3	4	1	237612	237623	237634	10.00	237645	29.99
7/16 - 14	H3	4	1	237656	237667	237678	17.19	237689	51.59
7/16 - 20	H3	4	1	237700	237711	237722	17.19	237733	51.59
1/2 - 13	H3	4	1	237744	237755	237766	17.92	237777	53.77
1/2 - 20	H3	4	1	237788	237799	237810	20.27	237821	60.79
9/16 - 12	H3	4	1	237832	237843	237854	30.02	237865	90.07
9/16 - 18	H3	4	1	237876	237887	237898	30.02	237909	90.07
5/8 - 11	H3	4	1	237920	237931	237942	36.07	237953	108.20
5/8 - 18	H3	4	1	237964	237975	237986	36.07	237997	108.20
11/16 - 11	H3	4	1	238008	238019	238030	44.78	238041	134.35
11/16 - 16	H3	4	1	238052	238063	238074	44.78	238085	134.35
3/4 - 10	H3	4	1	238096	238107	238118	50.47	238129	151.42
3/4 - 16	H3	4	1	238140	238151	238162	50.47	238173	151.42
7/8 - 9	H4	4	1	238184	238195	238206	70.35	238217	211.04
7/8 - 14	H4	4	1	238228	238239	238250	70.35	238261	211.04
1 - 8	H4	4	1	238272	238283	238294	93.45	238305	280.34
1 - 12	H4	4	1	238316	238327	238338	93.45	238349	280.34
1 - 14	H4	4	1	238360	238371	238382	93.45	238393	280.34
1-1/8 - 7	H4	4	1	238404	238415	238426	151.34	238437	454.02
1-1/8 - 12	H4	4	1	238448	238459	238470	160.30	238481	480.91
1-1/4 - 7	H4	4	1	238492	238503	238514	198.65	238525	595.95
1-1/4 - 12	H4	6	1	238536	238547	238558	202.12	238569	606.35
1-3/8 - 6	H4	4	1	238580	238591	238602	249.59	238613	748.76
1-3/8 - 12	H4	6	1	238624	238635	238646	251.35	238657	754.06
1-1/2 - 6	H4	4	1	238668	238679	238690	288.24	238701	864.71
1-1/2 - 12	H4	6	1	238712	238723	238734	293.53	238745	880.60

FOR GENERAL DIMENSIONS SEE PAGE 108

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

GOLD OXIDE - HAND TAPS

Gold Oxide Taps



SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
0 - 80	H2	2	1	238756	20.07
1 - 64	H2	2	1	238767	18.13
1 - 72	H2	2	1	238778	18.13
2 - 56	H2	2	1	238789	15.40
2 - 64	H2	2	1	238800	17.24
3 - 48	H2	2	1	238811	12.34
3 - 56	H2	2	1	238822	13.75
4 - 40	H2	2	1	238833	9.91
4 - 48	H2	2	1	238844	11.29
4 - 36	H2	2	1	238855	11.29
5 - 40	H2	2	1	238866	9.91
5 - 44	H2	2	1	238877	11.29
6 - 32	H3	2	1	238888	8.33
6 - 40	H2	2	1	238899	9.47
8 - 32	H3	2	1	238910	8.33
8 - 36	H2	2	1	238921	9.47
10 - 24	H3	2	1	238932	8.33
10 - 32	H3	2	1	238943	8.33
12 - 24	H3	2	1	238954	9.47
1/4 - 20	H3	2	1	238965	8.33
1/4 - 28	H3	2	1	238976	8.33
5/16 - 18	H3	2	1	238987	9.00
5/16 - 24	H3	2	1	238998	9.00
3/8 - 16	H3	3	1	239009	10.68
3/8 - 24	H3	3	1	239020	11.46
7/16 - 14	H3	3	1	239031	18.13
7/16 - 20	H3	3	1	239042	18.13
1/2 - 13	H3	3	1	239053	18.47
1/2 - 20	H3	3	1	239064	21.69
9/16 - 12	H3	3	1	239075	30.19
9/16 - 18	H3	3	1	239086	30.19
5/8 - 11	H3	3	1	239097	41.15
5/8 - 18	H3	3	1	239108	41.15
3/4 - 10	H3	3	1	239119	58.03
3/4 - 16	H3	3	1	239130	58.03

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

GOLD OXIDE - SPIRAL POINT PLUG TAPS

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS



Gold Oxide Taps

HAND TAPS



HIGH SPEED STEEL
METRIC

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	-	239141	-	21.73	-	-
M2 x 0.4	D3	3	1	239152	239163	239174	21.73	239944	65.19
M2.5 x 0.45	D3	3	1	-	239185	-	13.36	-	-
M3 x 0.5	D3	3	1	239196	239207	239218	11.15	239955	33.45
M3.5 x 0.6	D4	3	1	-	239229	-	9.21	-	-
M4 x 0.7	D4	4	1	239240	239251	239262	9.21	239966	27.64
M4.5 x 0.75	D4	4	1	-	239273	-	9.21	-	-
M5 x 0.8	D4	4	1	239284	239295	239306	9.21	239977	27.64
M6 x 1.0	D5	4	1	239317	239328	239339	9.73	239988	29.19
M7 x 1.0	D5	4	1	239350	239361	239372	9.74	239999	29.20
M8 x 1.25	D5	4	1	239383	239394	239405	9.74	240010	29.20
M10 x 1.25	D5	4	1	239416	239427	239438	19.97	240021	59.91
M10 x 1.50	D6	4	1	239449	239460	239471	19.97	240032	59.91
M12 x 1.25	D5	4	1	239482	239493	239504	23.41	240043	70.25
M12 x 1.75	D6	4	1	239515	239526	239537	23.41	240054	70.25
M14 x 1.5	D6	4	1	239548	239559	239570	35.02	240065	105.06
M14 x 2.0	D7	4	1	239581	239592	239603	35.02	240076	105.06
M16 x 1.5	D6	4	1	239614	239625	239636	42.68	240087	128.05
M16 x 2.0	D7	4	1	239647	239658	239669	42.68	240098	128.05
M18 x 1.5	D6	4	1	239680	239691	239702	57.47	240109	172.40
M18 x 2.5	D7	4	1	239713	239724	239735	57.47	240120	172.40
M20 x 2.5	D7	4	1	239746	239757	239768	74.33	240131	222.98
M24 x 3.0	D8	4	1	239779	239790	239801	108.76	240142	326.29
M27 x 3.0	D8	4	1	239812	239823	239834	188.00	240153	563.98
M30 x 3.5	D9	4	1	239845	239856	239867	240.08	240164	720.26
M33 x 3.5	D9	4	1	239878	239889	239900	239.45	240175	718.34
M36 x 4.0	D9	4	1	239911	239922	239933	303.68	240186	911.03

SPIRAL POINT PLUG TAPS



HIGH SPEED STEEL
METRIC

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M2 x 0.4	D3	2	1	240197	22.22
M2.5 x 0.45	D3	2	1	240208	15.91
M3 x 0.5	D3	2	1	240219	12.80
M3.5 x 0.6	D4	2	1	240230	11.05
M4 x 0.7	D4	2	1	240241	11.05
M4.5 x 0.75	D4	2	1	240252	11.05
M5 x 0.8	D4	2	1	240263	11.05
M6 x 1.0	D5	2	1	240274	11.05
M7 x 1.0	D5	2	1	240285	12.75
M8 x 1.25	D5	2	1	240296	12.75
M10 x 1.50	D6	3	1	240307	21.19
M12 x 1.75	D6	3	1	240318	26.52
M14 x 2.0	D7	3	1	240329	41.16
M16 x 2.0	D7	3	1	240340	46.64
M18 x 2.5	D7	3	1	240351	68.60
M20 x 2.5	D7	4	1	240362	90.55

NPT TAPER PIPE TAPS



HIGH SPEED STEEL

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	240373	30.06
1/8 - 27*	4	1	240384	30.06
1/8 - 27	4	1	240395	30.06
1/4 - 18	4	1	240406	33.26
3/8 - 18	4	1	240417	43.77
1/2 - 14	4	1	240428	69.61
3/4 - 14	5	1	240439	97.38
1 - 11-1/2	5	1	240450	147.98
1-1/4 - 11-1/2	5	1	240461	210.93
1-1/2 - 11-1/2	7	1	240472	282.95
2 - 11-1/2	7	1	240483	384.89

* SMALL SHANK

FOR GENERAL DIMENSIONS SEE PAGE 108

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

Hi Spiral Flute Taps



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



METRIC

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
3 - 48	H2	2	1	198504	27.80
3 - 56	H2	2	1	198515	27.80
4 - 40	H2	2	1	198526	22.87
4 - 48	H2	2	1	198537	22.87
5 - 40	H3	2	1	198548	22.87
5 - 44	H3	2	1	198559	22.87
6 - 32	H3	2	1	198570	18.56
6 - 40	H3	2	1	198581	18.56
8 - 32	H3	3	1	198592	18.56
8 - 36	H3	3	1	198603	18.56
10 - 24	H3	3	1	198614	18.56
10 - 32	H3	3	1	198625	18.56
12 - 24	H3	3	1	198636	20.15
12 - 28	H3	3	1	198647	20.15
1/4 - 20	H3	3	1	198658	20.15
1/4 - 28	H3	3	1	198669	20.15
5/16 - 18	H3	3	1	198680	24.82
5/16 - 24	H3	3	1	198691	24.82
3/8 - 16	H3	3	1	198702	28.64
3/8 - 24	H3	3	1	198713	28.64
7/16 - 14	H3	3	1	198724	42.94
7/16 - 20	H3	3	1	198735	42.94
1/2 - 13	H3	3	1	198746	51.69
1/2 - 20	H3	3	1	198757	51.69
9/16 - 12	H3	4	1	198768	86.21
9/16 - 18	H3	4	1	198779	86.21
5/8 - 11	H3	4	1	198790	112.51
5/8 - 18	H3	4	1	198801	112.51
3/4 - 10	H3	4	1	198812	144.01
3/4 - 16	H3	4	1	198823	144.01

SIZE	D-LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
M3 x 0.5	D3	2	1	198834	23.53
M3.5 x 0.6	D4	3	1	198845	19.04
M4 x 0.7	D4	3	1	198856	19.04
M4.5 x 0.75	D4	3	1	198867	19.04
M5 x 0.8	D4	3	1	198878	19.04
M6 x 1.0	D5	3	1	198889	20.80
M8 x 1.25	D5	3	1	198900	25.64
M10 x 1.5	D6	3	1	198911	44.32
M12 x 1.75	D6	3	1	198922	53.36

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

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

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



Thread Forming Taps

PLUG & BOTTOMING HIGH SPEED STEEL



TIN COATED



METRIC
TIN COATED

SIZE	H LIMIT	# OF LUBE GROOVES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
0 - 80	H2	1	1	-	209669	25.16
0 - 80	H3	1	1	-	209680	25.16
1 - 64	H2	1	1	-	209691	25.16
1 - 72	H2	1	1	-	209702	25.16
2 - 56	H2	1	1	-	209713	25.00
2 - 56	H3	1	1	-	209724	25.00
2 - 64	H2	1	1	-	209735	25.00
2 - 64	H3	1	1	-	209746	25.00
3 - 48	H2	1	1	-	209757	25.00
3 - 48	H3	1	1	-	209768	25.00
3 - 56	H2	1	1	-	209779	25.00
3 - 56	H3	1	1	-	209790	25.00
4 - 40	H3	1	1	209801	209812	22.52
4 - 40	H5	1	1	209823	209834	22.52
4 - 48	H3	1	1	209845	209856	22.52
4 - 48	H5	1	1	209867	209878	22.52
5 - 40	H3	1	1	209889	209900	22.52
5 - 40	H5	1	1	209911	209922	22.52
5 - 44	H3	1	1	209933	209944	22.52
5 - 44	H5	1	1	209955	209966	22.52
6 - 32	H3	1	1	209977	209988	18.56
6 - 32	H5	1	1	209999	210010	18.56
6 - 32	H7	1	1	210021	210032	18.56
6 - 40	H3	1	1	210043	210054	18.56
6 - 40	H5	1	1	210065	210076	18.56
8 - 32	H3	1	1	210087	210098	18.56
8 - 32	H5	1	1	210109	210120	18.56
8 - 32	H7	1	1	210131	210142	18.56
8 - 36	H3	1	1	210153	210164	18.56
10 - 24	H4	1	1	210175	210186	17.85
10 - 24	H6	1	1	210197	210208	17.85
10 - 32	H4	1	1	210219	210230	17.85
10 - 32	H6	1	1	210241	210252	17.85
12 - 24	H4	2	1	210263	210274	17.85
12 - 24	H6	2	1	210285	210296	17.85
12 - 28	H4	2	1	210307	210318	17.85
1/4 - 20	H3	2	1	210329	210340	18.95
1/4 - 20	H4	2	1	210351	210362	18.95
1/4 - 20	H6	2	1	210373	210384	18.95
1/4 - 28	H4	2	1	210395	210406	18.95
1/4 - 28	H6	2	1	210417	210428	18.95
5/16 - 18	H5	2	1	210439	210450	21.06
5/16 - 18	H7	2	1	210461	210472	21.06
5/16 - 24	H5	2	1	210483	210494	21.06
5/16 - 24	H7	2	1	210505	210516	21.06
3/8 - 16	H5	2	1	210527	210538	21.06
3/8 - 16	H7	2	1	210549	210560	24.03
3/8 - 24	H5	2	1	210571	210582	24.03
3/8 - 24	H7	2	1	210593	210604	24.03
7/16 - 14	H5	2	1	210615	210626	36.58
7/16 - 14	H8	2	1	210637	210648	36.58
7/16 - 20	H5	2	1	210659	210670	36.58
7/16 - 20	H8	2	1	210681	210692	36.58
1/2 - 13	H5	2	1	210703	210714	40.89
1/2 - 13	H8	2	1	210725	210736	40.89
1/2 - 20	H5	2	1	210747	210758	40.89
1/2 - 20	H8	2	1	210769	210780	40.89

SIZE	D LIMIT	# OF LUBE GROOVES	PKG. QTY.	PLUG ITEM#	BOTTOM ITEM#	LIST PRICE
M3 x 0.5	D5	1	1	199329	199340	18.68
M4 x 0.7	D6	1	1	199351	199362	18.68
M5 x 0.8	D7	1	1	199373	199384	18.68
M6 x 1.0	D8	2	1	199395	199406	19.82
M8 x 1.25	D9	2	1	199417	199428	22.68
M10 x 1.5	D10	2	1	199439	199450	25.51
M12 x 1.75	D11	2	1	199461	199472	44.02

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

FOR GENERAL DIMENSIONS SEE PAGE 108

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

Spiral Point Bottoming Taps



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
0 - 80	H2	2	1	208943	30.27
2 - 56	H2	2	1	208954	23.22
3 - 48	H2	2	1	208965	18.62
4 - 40	H2	2	1	208976	14.94
5 - 40	H2	2	1	208987	14.94
6 - 32	H2	2	1	208998	12.56
6 - 32	H3	2	1	209009	12.56
6 - 40	H2	2	1	209020	14.28
8 - 32	H2	2	1	209031	12.56
8 - 32	H3	2	1	209042	12.56
10 - 24	H2	2	1	209053	14.28
10 - 24	H3	2	1	209064	12.56
10 - 32	H2	2	1	209075	12.56
10 - 32	H3	2	1	209086	12.56
12 - 24	H3	2	1	209097	14.28
1/4 - 20	H3	2	1	209108	12.56
1/4 - 28	H3	2	1	209119	12.56
5/16 - 18	H3	2	1	209130	13.57
5/16 - 24	H3	2	1	209141	13.57

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



ALL TOOLS ARE 100% MADE IN THE USA

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

SPIRAL POINT BOTTOMING TAPS
 COUNTERSINKS
 HSS & COBALT REAMERS
 HSS & COBALT ENDMILLS
 HSS & COBALT DRILLS
 CARBIDE BURS
 CARBIDE REAMERS
 CARBIDE DRILLS
 CARBIDE DRILL MILLS
 CARBIDE THREADMILLS
 CARBIDE MICRO ENDMILLS
 CARBIDE ENDMILLS



Combination Drill & Taps



HIGH SPEED STEEL

SIZE	SHANK DIA.	OVERALL LENGTH	DRILL LENGTH	DRILL SIZE	THREAD LENGTH	# OF FLUTES	PACKAGE QUANTITY	ITEM#	LIST PRICE
4-40	0.141	1-7/8	1/4	0.0910	3/8	2	1	198251	30.46
5-40	0.141	1-15/16	9/32	0.1040	13/32	2	1	198262	30.46
6-32	0.141	2	5/16	0.1115	7/16	2	1	198273	30.46
8-32	0.168	2-1/8	3/8	0.1375	1/2	2	1	198284	30.46
10-24	0.194	2-3/8	13/32	0.1545	5/8	2	1	198295	30.46
10-32	0.194	2-3/8	13/32	0.1635	5/8	2	1	198306	30.46
12-24	0.220	2-3/8	15/32	0.1805	21/32	2	1	198317	32.92
1/4-20	0.255	2-1/2	17/32	0.2080	25/32	2	1	198328	30.46
1/4-28	0.255	2-1/2	17/32	0.2200	25/32	2	1	198339	30.46
5/16-18	0.318	2-27/32	11/16	0.2660	15/16	2	1	198350	44.99
5/16-24	0.318	2-27/32	11/16	0.2770	15/16	2	1	198361	44.99
3/8-16	0.381	3-3/8	13/16	0.3225	1-1/16	2	1	198372	54.64
3/8-24	0.381	3-3/8	13/16	0.3395	1-1/16	2	1	198383	54.64
7/16-14	0.323	3-3/4	1	0.3770	1-1/4	2	1	198394	65.40
7/16-20	0.323	3-3/4	1	0.3955	1-1/4	2	1	198405	65.40
1/2-13	0.367	4-1/16	1-1/8	0.4350	1-3/8	2	1	198416	73.81
1/2-20	0.367	4-1/16	1-1/8	0.4580	1-3/8	2	1	198427	73.81

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	33.52
M5 x 0.8	0.194	2-3/8	13/32	0.1700	5/8	2	1	198449	33.52
M6 x 1.0	0.255	2-1/2	17/32	0.2030	25/32	2	1	198460	33.52
M8 x 1.25	0.318	2-27/32	11/16	0.2730	15/16	2	1	198471	60.71
M10 x 1.50	0.381	3.38	13/16	0.3440	0.69	2	1	198482	69.38
M12 x 1.75	0.367	4-1/16	1-1/8	0.4140	1-3/8	2	1	198493	69.38

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

COMBINATION DRILL & TAPS

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS

Taper Pipe Taps



NPT HIGH SPEED STEEL



UNCOATED



STEAM OXIDE



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	UNCOATED	LIST PRICE	STEAM OXIDE	LIST PRICE	TIN	LIST PRICE
1/16 - 27	4	1	212023	26.14	233396	30.06	233407	33.98
1/8 - 27*	4	1	212034	26.14	233418	30.06	233429	33.98
1/8 - 27	4	1	212045	26.14	233440	30.06	233451	33.98
1/4 - 18	4	1	212056	28.92	233462	33.26	233473	37.60
3/8 - 18	4	1	212067	38.06	233484	43.77	233495	49.48
1/2 - 14	4	1	212078	60.53	233506	69.61	233517	78.69
3/4 - 14	5	1	212089	84.68	233528	97.38	233539	110.09
1 - 11-1/2	5	1	212100	128.68	233550	147.98	233561	154.27
1-1/4 - 11-1/2	5	1	212111	183.42	233572	210.93	233583	238.45
1-1/2 - 11-1/2	7	1	212122	246.04	233594	282.95	233605	319.85
2 - 11-1/2	7	1	212133	334.68	233616	384.89	233627	435.09

* 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	40.53	233638	46.61	233649	52.69
1/8 - 27	5	1	212155	40.53	233660	46.61	233671	52.69
1/4 - 18	5	1	212166	44.83	233682	51.55	233693	58.27
3/8 - 18	5	1	212177	56.71	233704	65.22	233715	73.73
1/2 - 14	5	1	212188	90.20	233726	103.73	233737	117.26
3/4 - 14	5	1	212199	131.25	233748	150.94	233759	170.62
1 - 11-1/2	5	1	212210	199.46	233770	229.38	233781	259.30
1-1/4 - 11-1/2	5	1	212221	282.47	233792	324.84	233803	367.22
1-1/2 - 11-1/2	7	1	212232	378.90	233814	435.74	233825	492.57
2 - 11-1/2	7	1	212243	512.06	233836	588.87	233847	665.67

* SMALL SHANK

FOR GENERAL DIMENSIONS SEE PAGE 108

MADE IN THE USA

TAPER PIPE TAPS

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



Taper Pipe Taps

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

TAPER PIPE TAPS

NPTF DRYSEAL HIGH SPEED STEEL



UNCOATED



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	212254	28.75
1/8 - 27*	4	1	212265	28.75
1/8 - 27	4	1	212276	28.75
1/4 - 18	4	1	212287	31.82
3/8 - 18	4	1	212298	41.87
1/2 - 14	4	1	212309	66.59
3/4 - 14	5	1	212320	93.14
1 - 11-1/2	5	1	212331	141.54
1-1/4 - 11-1/2	5	1	212342	201.77
1-1/2 - 11-1/2	7	1	212353	270.63
2 - 11-1/2	7	1	212364	368.15

* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/16 - 27	4	1	245700	43.07
1/8 - 27*	4	1	245711	43.07
1/8 - 27	4	1	245722	43.07
1/4 - 18	4	1	245733	47.66
3/8 - 18	4	1	245744	62.72
1/2 - 14	4	1	245755	99.75
3/4 - 14	5	1	245766	139.54
1 - 11-1/2	5	1	245777	212.04
1-1/4 - 11-1/2	5	1	245788	302.25
1-1/2 - 11-1/2	7	1	245799	405.41
2 - 11-1/2	7	1	245810	551.49

* 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	44.58
1/8 - 27	5	1	212386	44.58
1/4 - 18	5	1	212397	49.31
3/8 - 18	5	1	212408	62.38
1/2 - 14	5	1	212419	99.21
3/4 - 14	5	1	212430	144.38
1 - 11-1/2	5	1	212441	219.40
1-1/4 - 11-1/2	5	1	212452	310.71
1-1/2 - 11-1/2	7	1	212463	416.79
2 - 11-1/2	7	1	212474	563.27

* SMALL SHANK

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27*	5	1	212475	66.79
1/8 - 27	5	1	212476	66.79
1/4 - 18	5	1	212477	73.87
3/8 - 18	5	1	212478	93.45
1/2 - 14	5	1	212479	148.62
3/4 - 14	5	1	212480	216.28
1 - 11-1/2	5	1	212481	328.67
1-1/4 - 11-1/2	5	1	212482	465.44
1-1/2 - 11-1/2	7	1	212483	624.35
2 - 11-1/2	7	1	212484	843.78

* SMALL SHANK

FOR GENERAL DIMENSIONS SEE PAGE 108

Pipe Taps



STRAIGHT PIPE - NPS HIGH SPEED STEEL



UNCOATED



TIN COATED

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212683	41.75
1/4 - 18	4	1	212694	46.20
3/8 - 18	4	1	212705	60.80
1/2 - 14	4	1	212716	96.70
3/4 - 14	5	1	212727	135.26
1 - 11-1/2	5	1	212738	205.54

SIZE	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	1	212740	62.54
1/4 - 18	4	1	212742	69.21
3/8 - 18	4	1	212744	91.08
1/2 - 14	4	1	212745	144.85
3/4 - 14	5	1	212746	202.62
1 - 11-1/2	5	1	212747	307.91

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	78.26
1/4 - 18	4	6	1	212760	90.21
3/8 - 18	4	6	1	212771	122.04
1/2 - 14	4	6	1	212782	195.85



TIN COATED

SIZE	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/8 - 27	4	6	1	212784	117.24
1/4 - 18	4	6	1	212786	135.13
3/8 - 18	4	6	1	212788	182.82
1/2 - 14	4	6	1	212790	293.37

FOR GENERAL DIMENSIONS SEE PAGE 108

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



Taps

STI - SPIRAL POINT PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
4 - 40	H1	2	1	209262	19.81
5 - 40	H1	2	1	209273	19.81
6 - 32	H2	2	1	209284	19.94
6 - 40	H2	2	1	209295	19.94
8 - 32	H2	2	1	209306	20.14
10 - 24	H2	2	1	209317	20.51
10 - 32	H2	2	1	209328	20.89
12 - 24	H2	2	1	209339	20.89
1/4 - 20	H2	2	1	209350	20.89
1/4 - 28	H2	2	1	209361	21.22
5/16 - 18	H3	3	1	209372	26.82
5/16 - 24	H2	3	1	209383	27.17
3/8 - 16	H3	3	1	209394	33.02
3/8 - 24	H2	3	1	209405	33.43
7/16 - 14	H3	3	1	209416	36.23
7/16 - 20	H3	3	1	209427	36.23
1/2 - 13	H3	3	1	209438	40.32
1/2 - 20	H3	3	1	209449	40.32

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	17.67
5 - 40	H1	3	1	198955	198966	17.67
6 - 32	H2	3	1	198977	198988	17.97
6 - 40	H1	3	1	198999	199010	17.97
8 - 32	H2	3	1	199021	199032	18.38
10 - 24	H2	3	1	199043	199054	18.38
10 - 32	H2	3	1	199065	199076	19.14
12 - 24	H2	3	1	199087	199098	19.14
1/4 - 20	H2	3	1	199109	199120	19.23
1/4 - 28	H2	3	1	199131	199142	19.23
5/16 - 18	H3	4	1	199153	199164	20.75
5/16 - 24	H2	4	1	199175	199186	20.75
3/8 - 16	H3	4	1	199197	199208	22.52
3/8 - 24	H2	4	1	199219	199230	22.52
7/16 - 14	H3	4	1	199241	199252	30.99
7/16 - 20	H3	4	1	199263	199274	30.99
1/2 - 13	H3	4	1	199285	199296	34.79
1/2 - 20	H3	4	1	199307	199318	34.79

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	10.24
8 - 32	H11	2	1	209163	10.24
10 - 24	H11	2	1	209174	11.14
10 - 32	H11	2	1	209185	11.14
1/4 - 20	H11	2	1	209196	12.70
5/16 - 18	H11	2	1	209207	14.60
3/8 - 16	H11	3	1	209218	16.60
7/16 - 14	H11	3	1	209229	24.92
1/2 - 13	H11	3	1	209240	30.32
5/8 - 11	H11	3	1	209251	51.66

+.005 OVERSIZE HAND PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	PKG. QTY.	ITEM#	LIST PRICE
6 - 32	H11	3	1	207051	8.51
8 - 32	H11	4	1	207062	8.51
10 - 24	H11	4	1	207073	9.42
10 - 32	H11	4	1	207084	9.42
1/4 - 20	H11	4	1	207095	11.23
5/16 - 18	H11	4	1	207106	14.15
3/8 - 16	H11	4	1	207117	16.24
7/16 - 14	H11	4	1	207128	23.52
1/2 - 13	H11	4	1	207139	27.59
5/8 - 11	H11	4	1	207150	51.97

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

FOR GENERAL DIMENSIONS SEE PAGE 108

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

TAPS

Taps



PULLEY - PLUG



HIGH SPEED STEEL

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/4 - 20	H3	4	6	1	209460	60.12
1/4 - 20	H3	4	8	1	209471	74.33
5/16 - 18	H3	4	6	1	209482	63.40
5/16 - 18	H3	4	8	1	209493	76.52
3/8 - 16	H3	4	6	1	209504	71.05
3/8 - 16	H3	4	8	1	209515	85.26
3/8 - 16	H3	4	10	1	209526	107.13
7/16 - 14	H3	4	6	1	209537	75.42
7/16 - 14	H3	4	8	1	209548	98.37
1/2 - 13	H3	4	6	1	209559	76.52

SIZE	H LIMIT	# OF FLUTES	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1/2 - 13	H3	4	8	1	209570	100.56
1/2 - 13	H3	4	10	1	209581	123.52
1/2 - 13	H3	4	12	1	209592	151.94
5/8 - 11	H3	4	6	1	209603	101.66
5/8 - 11	H3	4	8	1	209614	132.26
5/8 - 11	H3	4	10	1	209625	166.15
5/8 - 11	H3	4	12	1	209636	194.57
3/4 - 10	H3	4	10	1	209647	194.57
3/4 - 10	H3	4	12	1	209658	231.73
-	-	-	-	-	-	-

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	61.00
8 - 32	H3	6	NC	3/4	1/4	0.123	0.092	2	1	212496	59.75
10 - 24	H3	6	NC	7/8	1/4	0.136	0.102	2	1	212507	56.01
10 - 32	H3	6	NF	7/8	1/4	0.136	0.102	2	1	212518	56.01
1/4 - 20	H3	6	NC	1	5/16	0.185	0.139	2	1	212529	76.40
1/4 - 28	H3	6	NF	1	5/16	0.185	0.139	2	1	212540	76.40
5/16 - 18	H3	6	NC	1-1/8	3/8	0.240	0.180	2	1	212551	80.22
5/16 - 24	H3	6	NF	1-1/8	3/8	0.240	0.180	2	1	212562	80.22
3/8 - 16	H3	6	NC	1-1/4	7/16	0.275	0.206	3	1	212573	86.41
3/8 - 24	H3	6	NF	1-1/4	7/16	0.275	0.206	3	1	212584	86.41
7/16 - 14	H3	6	NC	1-7/16	13/32	0.323	0.242	3	1	212595	99.05
7/16 - 20	H3	6	NF	1-7/16	13/32	0.323	0.242	3	1	212606	99.05
1/2 - 13	H3	6	NC	1-21/32	7/16	0.367	0.275	3	1	212617	104.00
1/2 - 20	H3	6	NF	1-21/32	7/16	0.367	0.275	3	1	212628	104.00
5/8 - 11	H3	6	NC	1-13/16	9/16	0.480	0.360	3	1	212639	134.34
5/8 - 18	H3	6	NF	1-13/16	9/16	0.480	0.360	3	1	212650	134.34
3/4 - 10	H3	6	NC	2	11/16	0.590	0.442	3	1	212661	174.48
3/4 - 16	H3	6	NF	2	11/16	0.590	0.442	3	1	212672	174.48

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

FOR GENERAL DIMENSIONS SEE PAGE 108

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



HSS Dies & Die Stocks

ADJUSTABLE ROUND SPLIT



HIGH SPEED STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
4-40	1	171708	50.50
5-40	13/16	171719	41.69
5-44	13/16	171730	41.69
6-32	13/16	171741	41.69
6-32	1	171752	50.50
6-40	13/16	171763	41.69
8-32	13/16	171774	41.69
8-32	1	171785	50.50
10-24	13/16	171796	41.69
10-24	1	171807	50.50
10-32	13/16	171818	41.69
10-32	1	171829	50.50
12-24	13/16	171840	41.69
12-24	1	171851	50.50
12-28	13/16	171862	41.69
1/4-20	13/16	171873	41.69
1/4-20	1	171884	50.50

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
1/4-20	1-1/2	171895	82.56
1/4-28	13/16	171906	41.69
1/4-28	1	171917	50.50
1/4-28	1-1/2	171928	82.56
5/16-18	13/16	171939	41.69
5/16-18	1	171950	50.50
5/16-18	1-1/2	171961	82.56
5/16-24	13/16	171972	41.69
5/16-24	1	171983	50.50
5/16-24	1-1/2	171994	82.56
3/8-16	1	172005	50.50
3/8-16	1-1/2	172016	82.56
3/8-24	1	172027	50.50
3/8-24	1-1/2	172038	82.56
7/16-14	1	172049	50.50
7/16-14	1-1/2	172060	82.56
7/16-20	1	172071	50.50

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
7/16-20	1-1/2	172082	82.56
1/2-13	1	172093	50.50
1/2-13	1-1/2	172104	82.56
1/2-20	1	172115	50.50
1/2-20	1-1/2	172126	82.56
9/16-12	1-1/2	172137	82.56
9/16-18	1-1/2	172148	82.56
5/8-11	1-1/2	172159	82.56
5/8-11	2	172170	112.22
5/8-18	1-1/2	172181	82.56
5/8-18	2	172192	112.22
3/4-10	1-1/2	172203	82.56
3/4-10	2	172214	112.22
3/4-16	1-1/2	172225	82.56
3/4-16	2	172236	112.22
7/8-9	2	172247	112.22
7/8-14	2	172258	112.22

DIE STOCKS



SIZE	ITEM#	LIST PRICE
13/16 OD	170190	26.29
1 OD	170201	37.57
1-1/2 OD	170212	61.56
2 OD	170223	108.37

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

HSS DIES & DIE STOCKS

Carbon Steel Dies



ADJUSTABLE ROUND SPLIT



CARBON STEEL

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
0-80	13/16	170234	46.55
1-64	13/16	170245	46.55
1-72	13/16	170256	46.55
2-56	13/16	170267	41.09
2-64	13/16	170278	41.09
3-48	13/16	170289	36.77
3-56	13/16	170300	36.77
4-40	13/16	170311	27.25
4-48	13/16	170322	27.25
4-36	13/16	170333	27.25
5-40	13/16	170344	27.25
5-44	13/16	170355	27.25
6-32	13/16	170366	27.25
6-32	1	170377	32.83
6-40	13/16	170388	27.25
8-32	13/16	170399	27.25
8-32	1	170410	32.83
8-36	13/16	170421	27.25
10-24	13/16	170432	27.25
10-24	1	170443	32.83
10-32	13/16	170454	27.25
10-32	1	170465	32.83
12-24	13/16	170476	27.25
12-24	1	170487	32.83
12-28	13/16	170498	27.25

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
3/16-24	1	170509	32.83
3/16-32	1	170520	32.83
1/4-20	1	170531	32.83
1/4-20	1-1/2	170542	53.70
1/4-28	1	170553	32.83
1/4-28	1-1/2	170564	53.70
1/4-24	1	170575	32.83
1/4-32	1	170586	32.83
5/16-18	1	170597	32.83
5/16-18	1-1/2	170608	53.70
5/16-24	1	170619	32.83
5/16-24	1-1/2	170630	53.70
5/16-32	1	170641	32.83
3/8-16	1	170652	32.83
3/8-16	1-1/2	170663	53.70
3/8-24	1	170674	32.83
3/8-24	1-1/2	170685	53.70
7/16-14	1	170696	32.83
7/16-14	1-1/2	170707	53.70
7/16-20	1	170718	32.83
7/16-20	1-1/2	170729	53.70
1/2-13	1-1/2	170740	53.70
1/2-20	1-1/2	170751	53.70
9/16-12	1-1/2	170762	53.70
9/16-18	1-1/2	170773	53.70

SIZE	OUTSIDE DIA.	ITEM#	LIST PRICE
5/8-11	1-1/2	170784	53.70
5/8-11	2-1/2	170795	136.26
5/8-18	1-1/2	170806	53.70
3/4-10	2-1/2	170817	136.26
3/4-16	2-1/2	170828	136.26
7/8-9	2	170839	72.94
7/8-9	2-1/2	170850	136.26
7/8-14	2	170861	72.94
7/8-14	2-1/2	170872	136.26
1-8	2-1/2	170883	136.26
1-8	3	170894	304.20
1-12	2-1/2	170905	136.26
1-12	3	170916	304.19
1-14	2-1/2	170927	136.26
1-14	3	170938	304.19
1-1/8-7	3	170949	304.19
1-1/8-12	3	170960	304.19
1-1/4-7	3	170971	304.19
1-1/4-12	3	170982	304.19
1-3/8-6	3	170993	304.19
1-3/8-12	3	171004	304.19
1-1/2-6	3	171015	304.19
1-1/2-12	3	171026	304.19
-	-	-	-
-	-	-	-

HEXAGON RETHREADING



CARBON STEEL

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1/4-20	19/32	1/4	1711037	19.24
1/4-28	19/32	1/4	1711048	19.24
5/16-18	11/16	5/16	1711059	22.45
5/16-24	11/16	5/16	1711070	22.45
3/8-16	25/32	3/8	1711081	24.85
3/8-24	25/32	3/8	1711092	24.85
7/16-14	7/8	7/16	1711103	30.46
7/16-20	7/8	7/16	1711114	30.46
1-2-13	1-1/16	1/2	1711125	33.67
1/2-20	1-1/16	1/2	1711136	33.67
9/16-12	1-1/16	1/2	1711147	36.07

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
9/16-18	1-1/16	1/2	1711158	36.07
5/8-11	1-1/4	5/8	1711169	37.67
5/8-18	1-1/4	5/8	1711180	37.67
11/16-11	1-7/16	3/4	1711191	41.69
11/16-16	1-7/16	3/4	171202	41.69
3/4-10	1-7/16	3/4	171213	46.49
3/4-16	1-7/16	3/4	171224	46.49
7/8-9	1-5/8	7/8	171235	50.50
7/8-14	1-5/8	7/8	171246	50.50
1-8	1-13/16	1	171257	56.91
1-12	1-13/16	1	171268	56.91

SIZE	ACROSS FLATS	THICKNESS	ITEM#	LIST PRICE
1-14	1-13/16	1	171279	56.91
1-1/8-7	2	1	171290	65.73
1-1/8-12	2	1	171301	65.73
1-1/4-7	2-3/16	1	171312	72.14
1-1/4-12	2-3/16	1	171323	72.14
1-3/8-6	2-3/8	1	171334	136.26
1-3/8-12	2-3/8	1	171345	136.26
1-1/2-6	2-9/16	1	171356	152.30
1-1/2-12	2-9/16	1	171367	152.30
-	-	-	-	-
-	-	-	-	-

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



Dies & Accessories

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



**NPT HEXAGON
RETHREADING
CARBON STEEL**

SIZE	ACROSS THE FLATS	THICKNESS	ITEM#	LIST PRICE
1/8 - 27 NPT	1-1/16	3/8	171576	26.61
1/4 - 18 NPT	1-1/4	5/8	171587	29.50
3/8 - 18 NPT	1-7/16	5/8	171598	40.77
1/2 - 14 NPT	1-5/8	3/4	171609	58.94
3/4 - 14 NPT	2	13/16	171620	72.84
1 - 11-1/2 NPT	2-3/8	1	171631	141.02



**METRIC HEXAGON
RETHREADING
CARBON STEEL**

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M3 x 0.5	1	171378	14.67
M4 x 0.7	1	171389	14.27
M5 x 0.8	1	171400	14.27
M6 x 1.0	1	171411	14.27
M7 x 1.0	1	171422	14.67
M8 x 1.25	1	171433	14.27
M10 x 1.25	1	171444	14.27
M10 x 1.50	1	171455	14.27
M12 x 1.25	1	171466	14.27

SIZE	ACROSS THE FLATS	ITEM#	LIST PRICE
M12 x 1.75	1	171477	14.27
M14 x 1.50	1-7/16	171488	22.12
M14 x 2.0	1-7/16	171499	22.12
M16 x 1.50	1-7/16	171510	22.12
M16 x 2.0	1-7/16	171521	22.12
M18 x 1.50	1-7/16	171532	22.12
M18 x 2.50	1-7/16	171543	22.12
M20 x 2.5	1-13/16	171554	46.23
M24 x 3.0	1-13/16	171565	46.23

**T - HANDLE
TAP WRENCHES**



SIZE	ITEM#	LIST PRICE
0 - 1/4	170146	12.18
1/4 - 1/2	170157	18.22

**ADJUSTABLE HANDLE
TAP WRENCHES**



SIZE	ITEM#	LIST PRICE
0 - 1/2	170168	38.74
1/2 - 1	170179	101.16

Tap & Die Sets



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

ITEM#	LIST PRICE
171686	861.70

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



CARBON STEEL - METRIC - HEX T&D SET

ITEM#	LIST PRICE
171697	316.62

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



CARBON STEEL - HEX DIE SET

ITEM#	LIST PRICE
171642	264.52

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

ITEM#	LIST PRICE
171653	264.52

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



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

ITEM#	LIST PRICE
171664	797.58

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

ITEM#	LIST PRICE
171675	797.58

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

TAP & DIE SETS

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS



Technical Information

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

TECHNICAL INFORMATION

MACHINE SCREW TAPS (NC & NF)

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

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 103 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

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

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

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

Drill Sets



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



ITEM# 120261
29 PC. HEAVY DUTY DRILL SET - BLACK/GOLD
HIGH SPEED STEEL

HIGH SPEED STEEL - JOBBER DRILL SETS

DESCRIPTION	ITEM#	LIST PRICE
13Pc. • 1/16" - 1/4" by 64ths • 118° Point • Oxidized	120107	30.91
13Pc. • 1/16" - 1/4" by 64ths • 118° Point • Bright	120118	30.91
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Oxidized	120140	86.30
15Pc. • 1/16" - 1/2" by 32nds • 118° Point • Bright	120162	86.30
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Oxidized	120173	95.19
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Oxidized	120184	72.93
21Pc. • 1/16" - 3/8" by 64ths • 118° Point • Bright	120195	72.93
25Pc. • 1.0mm - 13.0mm by 0.5mm • 118° Point • Oxidized	120203	166.55
26Pc. • A-Z • 118° Point • Oxidized	120217	122.07
26Pc. • A-Z • 118° Point • Bright	120228	122.07
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Oxidized	120239	118.58
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • Bright	120250	118.58
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Oxidized	120272	147.60
29Pc. • 1/16" - 1/2" by 64ths • 3/8" Reduced Shank • 118° Point • Oxidized	120283	126.38
29Pc. • 1/16" - 1/2" by 64ths • 118° Point • TIN Coated	120294	293.27
60Pc. • #1 - #60 • 118° Point • Oxidized	120305	107.27
60Pc. • #1 - #60 • 118° Point • Bright	120316	107.27
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Oxidized	120327	340.84
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • 118° Point • Bright	120338	340.84

HIGH SPEED STEEL - BLACK & GOLD SETS

DESCRIPTION	ITEM#	LIST PRICE
13Pc. • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120129	38.55
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Black/Gold	120151	111.64
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120206	109.36
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120261	178.65
29Pc. • 1/16" - 1/2" by 64ths • H.D. • 135° SP/PT • Black/Gold • Plastic Case	120569	178.65
115Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Black/Gold	120349	426.63

HSS DRILL SETS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

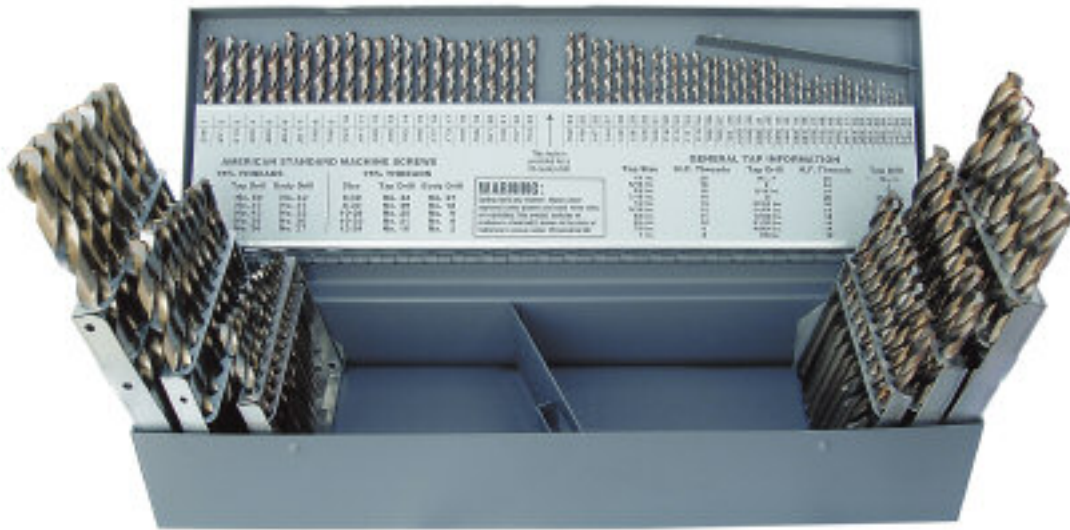
TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Drill Sets



ITEM# 120426

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

M42 COBALT - JOBBER DRILL SETS

DESCRIPTION	ITEM#	LIST PRICE
13Pc. • 1/16" - 1/4" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120360	41.67
15Pc. • 1/16" - 1/2" by 32nds • Heavy Duty • 135° SP/PT • Straw Finish	120371	140.57
21Pc. • 1/16" - 3/8" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120382	153.13
26Pc. • A - Z • Heavy Duty • 135° SP/PT • Straw Finish	120393	233.16
29Pc. • 1/16" - 1/2" by 64ths • Heavy Duty • 135° SP/PT • Straw Finish	120404	228.21
60Pc. • #1 - #60 • Heavy Duty • 135° SP/PT • Straw Finish	120415	199.18
115Pc. • 1/16" - 1/2" by 64ths • #1 - #60 • A - Z • H.D. • 135° SP/PT • Straw Finish	120426	840.06

DRILL INDEXES ONLY

DESCRIPTION	ITEM#	LIST PRICE
21Pc. • 1/16" - 3/8" by 64ths • Metal Case	120492	11.31
26Pc. • A - Z • Metal Case	120503	12.20
29Pc. • 1/16" - 1/2" by 64ths • Metal Case	120514	12.20
60Pc. • #1 - #60 • Metal Case	120525	12.10
115Pc. • 1/16" - 1/2" by 64ths, A - Z, #1 - #60 • Metal Case	120536	74.82

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	159.01

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

Drill Sets



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

SILVER & DEMING SETS - 1/2" SHANK

DESCRIPTION	ITEM#	LIST PRICE
8Pc. • HSS • 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1" • 118° Point • In Plastic Case	120448	288.20
33Pc. • HSS • 1/2" - 1" by 64ths • 118° Point • Metal Stand	120459	1,296.56
8Pc. • M42 Cobalt • 118° Split Point • In Plastic Case	120470	421.05
8Pc. • HSS • Black & Gold • 118° Split Point • In Plastic Case	120481	366.01



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	105.07
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Metal Case	120547	193.93
29Pc. • 1/16" - 1/2" by 64ths • Black/Gold • Heavy Duty • 135° SP/PT • Plastic Case	120580	193.93

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

HSS & COBALT DRILL SETS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



High Speed Steel Drills

JOBBER LENGTH - 118° POINT



BRIGHT FINISH

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	
1/64	3/16	3/4	12	106280	2.81	3/16	2-5/16	3-1/2	12	106401	1.72	23/64	3-1/2	4-7/8	6	106522	5.66	
1/32	1/2	1-3/8	12	106291	1.98	13/64	2-7/16	3-5/8	12	106412	1.97	3/8	3-5/8	5	6	106533	5.94	
3/64	3/4	1-3/4	12	106302	1.98	7/32	2-1/2	3-3/4	12	106423	2.16	25/64	3-3/4	5-1/8	6	106544	6.42	
1/16	7/8	1-7/8	12	106313	1.33	15/64	2-5/8	3-7/8	12	106434	2.42	13/32	3-7/8	5-1/4	6	106555	7.03	
5/64	1	2	12	106324	1.33	1/4	2-3/4	4	12	106445	2.48	27/64	3-15/16	5-3/8	6	106566	7.46	
3/32	1-1/4	2-1/4	12	106335	1.33	17/64	2-7/8	4-1/8	6	106456	3.54	7/16	4-1/16	5-1/2	6	106577	8.16	
7/64	1-1/2	2-5/8	12	106346	1.33	9/32	2-15/16	4-1/4	6	106467	3.76	29/64	4-3/16	5-5/8	6	106588	8.68	
1/8	1-5/8	2-3/4	12	106357	1.33	19/64	3-1/16	4-3/8	6	106478	4.13	15/32	4-5/16	5-3/4	6	106599	9.44	
9/64	1-3/4	2-7/8	12	106368	1.41	5/16	3-3/16	4-1/2	6	106489	4.30	31/64	4-3/8	5-7/8	6	106610	9.99	
5/32	2	3-1/8	12	106379	1.47	21/64	3-5/16	4-5/8	6	106500	4.80	1/2	4-1/2	6	6	106621	10.43	
11/64	2-1/8	3-1/4	12	106390	1.57	11/32	3-7/16	4-3/4	6	106511	5.15	-	-	-	-	-	-	-

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	2.42	J	2-7/8	4-1/8	6	107611	3.68	S	3-1/2	4-7/8	6	107710	5.66	
B	2-3/4	4	12	107523	2.48	K	2-15/16	4-1/4	6	107622	3.76	T	3-1/2	4-7/8	6	107721	5.94	
C	2-3/4	4	12	107534	2.48	L	2-15/16	4-1/4	6	107633	3.94	U	3-5/8	5	6	107732	6.42	
D	2-3/4	4	12	107545	2.55	M	3-1/16	4-3/8	6	107644	4.15	V	3-5/8	5	6	107743	6.64	
E	2-3/4	4	12	107556	2.59	N	3-1/16	4-3/8	6	107655	4.30	W	3-3/4	5-1/8	6	107754	7.08	
F	2-7/8	4-1/8	6	107567	3.57	O	3-3/16	4-1/2	6	107666	4.67	X	3-3/4	5-1/8	6	107765	7.50	
G	2-7/8	4-1/8	6	107578	3.42	P	3-5/16	4-5/8	6	107677	5.00	Y	3-7/8	5-1/4	6	107776	7.88	
H	2-7/8	4-1/8	6	107589	3.47	Q	3-7/16	4-3/4	6	107688	5.22	Z	3-7/8	5-1/4	6	107787	8.03	
I	2-7/8	4-1/8	6	107600	3.57	R	3-7/16	4-3/4	6	107699	5.41	-	-	-	-	-	-	-

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	2.63	28	1-3/4	2-7/8	12	106929	1.28	55	7/8	1-7/8	12	107226	1.36	
2	2-5/8	3-7/8	12	106643	2.63	29	1-3/4	2-7/8	12	106940	1.28	56	3/4	1-3/4	12	107237	1.36	
3	2-1/2	3-3/4	12	106654	2.42	30	1-5/8	2-3/4	12	106951	1.24	57	3/4	1-3/4	12	107248	1.50	
4	2-1/2	3-3/4	12	106665	2.42	31	1-5/8	2-3/4	12	106962	1.21	58	11/16	1-5/8	12	107259	1.50	
5	2-1/2	3-3/4	12	106676	2.38	32	1-5/8	2-3/4	12	106973	1.21	59	11/16	1-5/8	12	107270	1.50	
6	2-1/2	3-3/4	12	106687	2.38	33	1-1/2	2-5/8	12	106984	1.21	60	11/16	1-5/8	12	107281	1.50	
7	2-7/16	3-5/8	12	106698	2.30	34	1-1/2	2-5/8	12	106995	1.21	61	11/16	1-5/8	12	107292	1.57	
8	2-7/16	3-5/8	12	106709	2.30	35	1-1/2	2-5/8	12	107006	1.21	62	5/8	1-1/2	12	107303	1.57	
9	2-7/16	3-5/8	12	106720	2.26	36	1-7/16	2-1/2	12	107017	1.21	63	5/8	1-1/2	12	107314	1.57	
10	2-7/16	3-5/8	12	106731	2.07	37	1-7/16	2-1/2	12	107028	1.21	64	5/8	1-1/2	12	107325	1.57	
11	2-5/16	3-1/2	12	106742	2.07	38	1-7/16	2-1/2	12	107039	1.21	65	5/8	1-1/2	12	107336	1.57	
12	2-5/16	3-1/2	12	106753	2.07	39	1-3/8	2-3/8	12	107050	1.21	66	1/2	1-3/8	12	107347	1.57	
13	2-5/16	3-1/2	12	106764	2.07	40	1-3/8	2-3/8	12	107061	1.21	67	1/2	1-3/8	12	107358	1.57	
14	2-3/16	3-3/8	12	106775	1.97	41	1-3/8	2-3/8	12	107072	1.21	68	1/2	1-3/8	12	107369	1.57	
15	2-3/16	3-3/8	12	106786	1.97	42	1-1/4	2-1/4	12	107083	1.21	69	1/2	1-3/8	12	107380	1.57	
16	2-3/16	3-3/8	12	106797	1.97	43	1-1/4	2-1/4	12	107094	1.21	70	3/8	1-1/4	12	107391	1.57	
17	2-3/16	3-3/8	12	106808	1.87	44	1-1/8	2-1/8	12	107105	1.21	71	3/8	1-1/4	12	107402	1.57	
18	2-1/8	3-1/4	12	106819	1.87	45	1-1/8	2-1/8	12	107116	1.28	72	5/16	1-1/8	12	107413	1.57	
19	2-1/8	3-1/4	12	106830	1.87	46	1-1/8	2-1/8	12	107127	1.28	73	5/16	1-1/8	12	107424	2.08	
20	2-1/8	3-1/4	12	106841	1.68	47	1	2	12	107138	1.28	74	1/4	1	12	107435	2.08	
21	2-1/8	3-1/4	12	106852	1.68	48	1	2	12	107149	1.28	75	1/4	1	12	107446	2.08	
22	2	3-1/8	12	106863	1.60	49	1	2	12	107160	1.28	76	3/16	7/8	12	107457	2.08	
23	2	3-1/8	12	106874	1.60	50	1	2	12	107171	1.28	77	3/16	7/8	12	107468	2.34	
24	2	3-1/8	12	106885	1.60	51	1	2	12	107182	1.28	78	3/16	7/8	12	107479	2.34	
25	1-7/8	3	12	106896	1.39	52	7/8	1-7/8	12	107193	1.28	79	1/8	3/4	12	107490	2.34	
26	1-7/8	3	12	106907	1.39	53	7/8	1-7/8	12	107204	1.28	80	1/8	3/4	12	107501	2.34	
27	1-7/8	3	12	106918	1.39	54	7/8	1-7/8	12	107215	1.36	-	-	-	-	-	-	-

HSS JOBBER DRILLS

High Speed Steel Drills



JOBBER LENGTH - 118° POINT



TIN COATED

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	110647	3.47	7/32	2-1/2	3-3/4	12	110757	6.45	3/8	3-5/8	5	6	110867	16.07
5/64	1	2	12	110658	3.47	15/64	2-5/8	3-7/8	12	110768	6.75	25/64	3-3/4	5-1/8	6	110878	19.89
3/32	1-1/4	2-1/4	12	110669	3.47	1/4	2-3/4	4	12	110779	6.90	13/32	3-7/8	5-1/4	6	110889	20.34
7/64	1-1/2	2-5/8	12	110680	3.54	17/64	2-7/8	4-1/8	6	110790	9.82	27/64	3-15/16	5-3/8	6	110900	21.05
1/8	1-5/8	2-3/4	12	110691	3.54	9/32	2-15/16	4-1/4	6	110801	10.90	7/16	4-1/16	5-1/2	6	110911	21.50
9/64	1-3/4	2-7/8	12	110702	3.72	19/64	3-1/16	4-3/8	6	110812	11.12	29/64	4-3/16	5-5/8	6	110922	23.62
5/32	2	3-1/8	12	110713	4.12	5/16	3-3/16	4-1/2	6	110823	11.75	15/32	4-5/16	5-3/4	6	110933	24.31
11/64	2-1/8	3-1/4	12	110724	4.18	21/64	3-5/16	4-5/8	6	110834	13.39	31/64	4-3/8	5-7/8	6	110944	24.51
3/16	2-5/16	3-1/2	12	110735	4.40	11/32	3-7/16	4-3/4	6	110845	14.09	1/2	4-1/2	6	6	110955	25.01
13/64	2-7/16	3-5/8	12	110746	6.27	23/64	3-1/2	4-7/8	6	110856	15.90	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	110966	7.02	J	2-7/8	4-1/8	6	111065	11.95	S	3-1/2	4-7/8	6	111164	17.93
B	2-3/4	4	12	110977	7.19	K	2-15/16	4-1/4	6	111076	12.84	T	3-1/2	4-7/8	6	111175	18.80
C	2-3/4	4	12	110988	7.19	L	2-15/16	4-1/4	6	111087	12.84	U	3-5/8	5	6	111186	18.80
D	2-3/4	4	12	110999	7.19	M	3-1/16	4-3/8	6	111098	13.07	V	3-5/8	5	6	111197	19.04
E	2-3/4	4	12	111010	6.90	N	3-1/16	4-3/8	6	111109	13.31	W	3-3/4	5-1/8	6	111208	22.05
F	2-7/8	4-1/8	6	111021	11.85	O	3-3/16	4-1/2	6	111120	13.31	X	3-3/4	5-1/8	6	111219	23.75
G	2-7/8	4-1/8	6	111032	11.85	P	3-5/16	4-5/8	6	111131	13.87	Y	3-7/8	5-1/4	6	111230	25.31
H	2-7/8	4-1/8	6	111043	11.85	Q	3-7/16	4-3/4	6	111142	13.87	Z	3-7/8	5-1/4	6	111241	25.59
I	2-7/8	4-1/8	6	111054	11.85	R	3-7/16	4-3/4	6	111153	14.22	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	111252	7.02	21	2-1/8	3-1/4	12	111472	4.52	41	1-3/8	2-3/8	12	111692	3.47
2	2-5/8	3-7/8	12	111263	7.02	22	2	3-1/8	12	111483	4.52	42	1-1/4	2-1/4	12	111703	3.47
3	2-1/2	3-3/4	12	111274	6.73	23	2	3-1/8	12	111494	4.46	43	1-1/4	2-1/4	12	111714	3.47
4	2-1/2	3-3/4	12	111285	6.73	24	2	3-1/8	12	111505	4.46	44	1-1/8	2-1/8	12	111725	3.47
5	2-1/2	3-3/4	12	111296	6.73	25	1-7/8	3	12	111516	4.38	45	1-1/8	2-1/8	12	111736	3.47
6	2-1/2	3-3/4	12	111307	6.73	26	1-7/8	3	12	111527	4.38	46	1-1/8	2-1/8	12	111747	3.47
7	2-7/16	3-5/8	12	111318	6.40	27	1-7/8	3	12	111538	4.38	47	1	2	12	111758	3.47
8	2-7/16	3-5/8	12	111329	6.40	28	1-3/4	2-7/8	12	111549	4.25	48	1	2	12	111769	3.47
9	2-7/16	3-5/8	12	111340	6.40	29	1-3/4	2-7/8	12	111560	4.25	49	1	2	12	111780	3.47
10	2-7/16	3-5/8	12	111351	6.40	30	1-5/8	2-3/4	12	111571	3.54	50	1	2	12	111791	3.47
11	2-5/16	3-1/2	12	111362	6.40	31	1-5/8	2-3/4	12	111582	3.54	51	1	2	12	111802	3.47
12	2-5/16	3-1/2	12	111373	5.23	32	1-5/8	2-3/4	12	111593	3.54	52	7/8	1-7/8	12	111813	3.47
13	2-5/16	3-1/2	12	111384	5.15	33	1-1/2	2-5/8	12	111604	3.54	53	7/8	1-7/8	12	111824	3.47
14	2-3/16	3-3/8	12	111395	5.15	34	1-1/2	2-5/8	12	111615	3.54	54	7/8	1-7/8	12	111835	3.47
15	2-3/16	3-3/8	12	111406	5.15	35	1-1/2	2-5/8	12	111626	3.54	55	7/8	1-7/8	12	111846	3.47
16	2-3/16	3-3/8	12	111417	5.15	36	1-7/16	2-1/2	12	111637	3.47	56	3/4	1-3/4	12	111857	3.47
17	2-3/16	3-3/8	12	111428	5.15	37	1-7/16	2-1/2	12	111648	3.47	57	3/4	1-3/4	12	111868	3.47
18	2-1/8	3-1/4	12	111439	4.59	38	1-7/16	2-1/2	12	111659	3.47	58	11/16	1-5/8	12	111879	3.47
19	2-1/8	3-1/4	12	111450	4.59	39	1-3/8	2-3/8	12	111670	3.47	59	11/16	1-5/8	12	111890	3.47
20	2-1/8	3-1/4	12	111461	4.59	40	1-3/8	2-3/8	12	111681	3.47	60	11/16	1-5/8	12	111901	3.47

HSS JOBBER DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT REAMERS

HSS & COBALT ENDMILLS



High Speed Steel Drills

JOBBER LENGTH - 118° POINT



OXIDE FINISH

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

HSS JOBBER DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/64	3/16	3/4	12	104630	2.81
1/32	1/2	1-3/8	12	104641	1.98
3/64	3/4	1-3/4	12	104652	1.98
1/16	7/8	1-7/8	12	104663	1.33
5/64	1	2	12	104674	1.33
3/32	1-1/4	2-1/4	12	104685	1.33
7/64	1-1/2	2-5/8	12	104696	1.33
1/8	1-5/8	2-3/4	12	104707	1.33
9/64	1-3/4	2-7/8	12	104718	1.41
5/32	2	3-1/8	12	104729	1.47
11/64	2-1/8	3-1/4	12	104740	1.57
3/16	2-5/16	3-1/2	12	104751	1.72
13/64	2-7/16	3-5/8	12	104762	1.97
7/32	2-1/2	3-3/4	12	104773	2.16
15/64	2-5/8	3-7/8	12	104784	2.42

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/4	2-3/4	4	12	104795	2.48
17/64	2-7/8	4-1/8	6	104806	3.54
9/32	2-15/16	4-1/4	6	104817	3.76
19/64	3-1/16	4-3/8	6	104828	4.13
5/16	3-3/16	4-1/2	6	104839	4.30
21/64	3-5/16	4-5/8	6	104850	4.80
11/32	3-7/16	4-3/4	6	104861	5.15
23/64	3-1/2	4-7/8	6	104872	5.66
3/8	3-5/8	5	6	104883	5.94
25/64	3-3/4	5-1/8	6	104894	6.42
13/32	3-7/8	5-1/4	6	104905	7.03
27/64	3-15/16	5-3/8	6	104916	7.46
7/16	4-1/16	5-1/2	6	104927	8.16
29/64	4-3/16	5-5/8	6	104938	8.68
15/32	4-5/16	5-3/4	6	104949	9.44

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
31/64	4-3/8	5-7/8	6	104960	9.99
1/2	4-1/2	6	6	104971	10.43
33/64	4-13/16	6-5/8	1	104982	24.88
17/32	4-13/16	6-5/8	1	104993	26.06
35/64	4-13/16	6-5/8	1	105004	28.23
9/16	4-13/16	6-5/8	1	105015	29.54
37/64	4-13/16	6-5/8	1	105026	29.64
19/32	5-3/16	7-1/8	1	105037	30.46
39/64	5-3/16	7-1/8	1	105048	33.46
5/8	5-3/16	7-1/8	1	105059	32.65
41/64	5-3/16	7-1/8	1	105070	35.71
21/32	5-3/16	7-1/8	1	105081	34.51
43/64	5-5/8	7-5/8	1	105092	40.56
11/16	5-5/8	7-5/8	1	105103	39.67
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	105994	2.42
B	2-3/4	4	12	106005	2.48
C	2-3/4	4	12	106016	2.48
D	2-3/4	4	12	106027	2.55
E	2-3/4	4	12	106038	2.59
F	2-7/8	4-1/8	6	106049	3.57
G	2-7/8	4-1/8	6	106060	3.42
H	2-7/8	4-1/8	6	106071	3.47
I	2-7/8	4-1/8	6	106082	3.57

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	2-7/8	4-1/8	6	106093	3.68
K	2-15/16	4-1/4	6	106104	3.76
L	2-15/16	4-1/4	6	106115	3.94
M	3-1/16	4-3/8	6	106126	4.15
N	3-1/16	4-3/8	6	106137	4.30
O	3-3/16	4-1/2	6	106148	4.67
P	3-5/16	4-5/8	6	106159	5.00
Q	3-7/16	4-3/4	6	106170	5.22
R	3-7/16	4-3/4	6	106181	5.41

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	3-1/2	4-7/8	6	106192	5.66
T	3-1/2	4-7/8	6	106203	5.94
U	3-5/8	5	6	106214	6.42
V	3-5/8	5	6	106225	6.64
W	3-3/4	5-1/8	6	106236	7.08
X	3-3/4	5-1/8	6	106247	7.50
Y	3-7/8	5-1/4	6	106258	7.88
Z	3-7/8	5-1/4	6	106269	8.03
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	105114	2.63
2	2-5/8	3-7/8	12	105125	2.63
3	2-1/2	3-3/4	12	105136	2.42
4	2-1/2	3-3/4	12	105147	2.42
5	2-1/2	3-3/4	12	105158	2.38
6	2-1/2	3-3/4	12	105169	2.38
7	2-7/16	3-5/8	12	105180	2.30
8	2-7/16	3-5/8	12	105191	2.30
9	2-7/16	3-5/8	12	105202	2.26
10	2-7/16	3-5/8	12	105213	2.07
11	2-5/16	3-1/2	12	105224	2.07
12	2-5/16	3-1/2	12	105235	2.07
13	2-5/16	3-1/2	12	105246	2.07
14	2-3/16	3-3/8	12	105257	1.97
15	2-3/16	3-3/8	12	105268	1.97
16	2-3/16	3-3/8	12	105279	1.97
17	2-3/16	3-3/8	12	105290	1.87
18	2-1/8	3-1/4	12	105301	1.87
19	2-1/8	3-1/4	12	105312	1.87
20	2-1/8	3-1/4	12	105323	1.68
21	2-1/8	3-1/4	12	105334	1.68
22	2	3-1/8	12	105345	1.60
23	2	3-1/8	12	105356	1.60
24	2	3-1/8	12	105367	1.60
25	1-7/8	3	12	105378	1.39
26	1-7/8	3	12	105389	1.39
27	1-7/8	3	12	105400	1.39

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
28	1-3/4	2-7/8	12	105411	1.28
29	1-3/4	2-7/8	12	105422	1.28
30	1-5/8	2-3/4	12	105433	1.24
31	1-5/8	2-3/4	12	105444	1.21
32	1-5/8	2-3/4	12	105455	1.21
33	1-1/2	2-5/8	12	105466	1.21
34	1-1/2	2-5/8	12	105477	1.21
35	1-1/2	2-5/8	12	105488	1.21
36	1-7/16	2-1/2	12	105499	1.21
37	1-7/16	2-1/2	12	105510	1.21
38	1-7/16	2-1/2	12	105521	1.21
39	1-3/8	2-3/8	12	105532	1.21
40	1-3/8	2-3/8	12	105543	1.21
41	1-3/8	2-3/8	12	105554	1.21
42	1-1/4	2-1/4	12	105565	1.21
43	1-1/4	2-1/4	12	105576	1.21
44	1-1/8	2-1/8	12	105587	1.21
45	1-1/8	2-1/8	12	105598	1.28
46	1-1/8	2-1/8	12	105609	1.28
47	1	2	12	105620	1.28
48	1	2	12	105631	1.28
49	1	2	12	105642	1.28
50	1	2	12	105653	1.28
51	1	2	12	105664	1.28
52	7/8	1-7/8	12	105675	1.28
53	7/8	1-7/8	12	105686	1.28
54	7/8	1-7/8	12	105697	1.36

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
55	7/8	1-7/8	12	105708	1.36
56	3/4	1-3/4	12	105719	1.36
57	3/4	1-3/4	12	105730	1.50
58	11/16	1-5/8	12	105741	1.50
59	11/16	1-5/8	12	105752	1.50
60	11/16	1-5/8	12	105763	1.50
61	11/16	1-5/8	12	105774	1.57
62	5/8	1-1/2	12	105785	1.57
63	5/8	1-1/2	12	105796	1.57
64	5/8	1-1/2	12	105807	1.57
65	5/8	1-1/2	12	105818	1.57
66	1/2	1-3/8	12	105829	1.57
67	1/2	1-3/8	12	105840	1.57
68	1/2	1-3/8	12	105851	1.57
69	1/2	1-3/8	12	105862	1.57
70	3/8	1-1/4	12	105873	1.57
71	3/8	1-1/4	12	105884	1.57
72	5/16	1-1/8	12	105895	1.57
73	5/16	1-1/8	12	105906	2.08
74	1/4	1	12	105917	2.08
75	1/4	1	12	105928	2.08
76	3/16	7/8	12	105939	2.08
77	3/16	7/8	12	105950	2.34
78	3/16	7/8	12	105961	2.34
79	1/8	3/4	12	105972	2.34
80	1/8	3/4	12	105983	2.34
-	-	-	-	-	-

High Speed Steel Drills



JOBBER LENGTH - 118° POINT



OXIDE FINISH

METRIC SIZES						METRIC SIZES					
SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE	SIZE (mm)	FLUTE LENGTH	OVERALL LENGTH	PKG. QTY.	ITEM#	LIST PRICE
1.00	12	34	12	215037	1.63	5.20	52	86	12	215664	3.09
1.05	12	34	12	215048	1.80	5.30	52	86	12	215675	3.17
1.10	14	36	12	215059	1.72	5.40	57	93	12	215686	3.39
1.15	14	36	12	215070	1.76	5.50	57	93	12	215697	3.01
1.20	16	38	12	215081	1.72	5.60	57	93	12	215708	3.53
1.25	16	38	12	215092	1.76	5.70	57	93	12	215719	3.56
1.30	16	38	12	215103	1.72	5.80	57	93	12	215730	3.65
1.35	18	40	12	215114	1.80	5.90	57	93	12	215741	3.65
1.40	18	40	12	215125	1.72	6.00	57	93	12	215752	3.26
1.45	18	40	12	215136	1.80	6.10	63	101	12	215763	3.86
1.50	18	40	12	215147	1.72	6.20	63	101	12	215774	4.04
1.55	20	43	12	215158	1.80	6.30	63	101	12	215785	4.08
1.60	20	43	12	215169	1.72	6.40	63	101	6	215796	4.25
1.65	20	43	12	215180	1.76	6.50	63	101	6	215807	4.16
1.70	20	43	12	215191	1.76	6.60	63	101	6	215818	4.42
1.75	22	46	12	215202	1.80	6.70	63	101	6	215829	4.51
1.80	22	46	12	215213	1.76	6.80	69	109	6	215840	4.59
1.85	22	46	12	215224	1.80	6.90	69	109	6	215851	4.94
1.90	22	46	12	215235	1.76	7.00	69	109	6	215862	4.34
1.95	24	49	12	215246	1.80	7.10	69	109	6	215873	5.07
2.00	24	49	12	215257	1.76	7.20	69	109	6	215884	5.15
2.05	24	49	12	215268	1.80	7.30	69	109	6	215895	5.41
2.10	24	49	12	215279	1.80	7.40	69	109	6	215906	5.49
2.15	27	53	12	215290	1.85	7.50	69	109	6	215917	5.15
2.20	27	53	12	215301	1.80	7.60	75	117	6	215928	5.75
2.25	27	53	12	215312	1.88	7.70	75	117	6	215939	5.96
2.30	27	53	12	215323	1.80	7.80	75	117	6	215950	6.14
2.35	27	53	12	215334	1.98	7.90	75	117	6	215961	6.18
2.40	30	57	12	215345	1.85	8.00	75	117	6	215972	5.66
2.45	30	57	12	215356	2.06	8.10	75	117	6	215983	6.18
2.50	30	57	12	215367	1.85	8.20	75	117	6	215994	6.35
2.60	30	57	12	215378	2.02	8.30	75	117	6	216005	6.48
2.70	33	61	12	215389	2.02	8.40	75	117	6	216016	6.65
2.80	33	61	12	215400	2.06	8.50	75	117	6	216027	6.48
2.90	33	61	12	215411	2.06	8.60	81	125	6	216038	6.91
3.00	33	61	12	215422	1.94	8.70	81	125	6	216049	7.09
3.10	36	65	12	215433	2.19	8.80	81	125	6	216060	7.17
3.20	36	65	12	215444	2.32	8.90	81	125	6	216071	7.55
3.30	36	65	12	215455	2.19	9.00	81	125	6	216082	7.29
3.40	39	70	12	215466	2.24	9.10	81	125	6	216093	7.94
3.50	39	70	12	215477	2.02	9.20	81	125	6	216104	8.12
3.60	39	70	12	215488	2.36	9.30	81	125	6	216115	8.24
3.70	39	70	12	215499	2.40	9.40	81	125	6	216126	8.24
3.80	43	75	12	215510	2.45	9.50	81	125	6	216137	7.64
3.90	43	75	12	215521	2.49	9.60	87	133	6	216148	8.28
4.00	43	75	12	215532	2.10	9.70	87	133	6	216159	8.54
4.10	43	75	12	215543	2.54	9.80	87	133	6	216170	8.54
4.20	43	75	12	215554	2.54	9.90	87	133	6	216181	8.63
4.30	47	80	12	215565	2.57	10.00	87	133	6	216192	8.20
4.40	47	80	12	215576	2.75	10.20	87	133	6	216203	8.89
4.50	47	80	12	215587	2.36	10.50	87	133	6	216214	9.35
4.60	47	80	12	215598	2.84	11.00	94	142	6	216225	9.61
4.70	47	80	12	215609	2.57	11.20	94	142	6	216236	10.95
4.80	52	86	12	215620	2.84	11.50	94	142	6	216247	10.77
4.90	52	86	12	215631	2.92	12.00	101	151	6	216258	11.89
5.00	52	86	12	215642	2.66	12.50	101	151	6	216269	12.14
5.10	52	86	12	215653	3.09	13.00	101	151	6	216280	20.13

NOTE: ALL DIMENSIONS IN TABLE ARE METRIC (mm)

HSS JOBBER DRILLS

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



High Speed Steel Drills

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



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	107798	1.32	7/32	2-1/2	3-3/4	12	107908	2.51	3/8	3-5/8	5	6	108018	6.82
5/64	1	2	12	107809	1.32	15/64	2-5/8	3-7/8	12	107919	2.73	25/64	3-3/4	5-1/8	6	108029	7.41
3/32	1-1/4	2-1/4	12	107820	1.32	1/4	2-3/4	4	12	107930	2.92	13/32	3-7/8	5-1/4	6	108040	8.03
7/64	1-1/2	2-5/8	12	107831	1.32	17/64	2-7/8	4-1/8	6	107941	4.01	27/64	3-15/16	5-3/8	6	108051	8.65
1/8	1-5/8	2-3/4	12	107842	1.34	9/32	2-15/16	4-1/4	6	107952	4.35	7/16	4-1/16	5-1/2	6	108062	9.40
9/64	1-3/4	2-7/8	12	107853	1.43	19/64	3-1/16	4-3/8	6	107963	4.80	29/64	4-3/16	5-5/8	6	108073	10.03
5/32	2	3-1/8	12	107864	1.74	5/16	3-3/16	4-1/2	6	107974	4.96	15/32	4-5/16	5-3/4	6	108084	10.90
11/64	2-1/8	3-1/4	12	107875	1.87	21/64	3-5/16	4-5/8	6	107985	5.59	31/64	4-3/8	5-7/8	6	108095	11.52
3/16	2-5/16	3-1/2	12	107886	2.12	11/32	3-7/16	4-3/4	6	107996	5.94	1/2	4-1/2	6	6	108106	12.10
13/64	2-7/16	3-5/8	12	107897	2.30	23/64	3-1/2	4-7/8	6	108007	6.26	-	-	-	-	-	-

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	2-5/8	3-7/8	12	108777	3.13	J	2-7/8	4-1/8	6	108876	4.84	S	3-1/2	4-7/8	6	108975	7.65
B	2-3/4	4	12	108788	3.13	K	2-15/16	4-1/4	6	108887	4.84	T	3-1/2	4-7/8	6	108986	7.65
C	2-3/4	4	12	108799	3.13	L	2-15/16	4-1/4	6	108898	4.84	U	3-5/8	5	6	108997	8.13
D	2-3/4	4	12	108810	3.13	M	3-1/16	4-3/8	6	108909	5.94	V	3-5/8	5	6	109008	8.13
E	2-3/4	4	12	108821	3.13	N	3-1/16	4-3/8	6	108920	5.94	W	3-3/4	5-1/8	6	109019	9.22
F	2-7/8	4-1/8	6	108832	3.99	O	3-3/16	4-1/2	6	108931	5.94	X	3-3/4	5-1/8	6	109030	9.22
G	2-7/8	4-1/8	6	108843	3.99	P	3-5/16	4-5/8	6	108942	6.72	Y	3-7/8	5-1/4	6	109041	10.06
H	2-7/8	4-1/8	6	108854	3.99	Q	3-7/16	4-3/4	6	108953	6.72	Z	3-7/8	5-1/4	6	109052	10.06
I	2-7/8	4-1/8	6	108865	3.99	R	3-7/16	4-3/4	6	108964	6.72	-	-	-	-	-	-

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	108117	2.71	21	2-1/8	3-1/4	12	108337	2.16	41	1-3/8	2-3/8	12	108557	1.81
2	2-5/8	3-7/8	12	108128	2.71	22	2	3-1/8	12	108348	2.16	42	1-1/4	2-1/4	12	108568	1.81
3	2-1/2	3-3/4	12	108139	2.52	23	2	3-1/8	12	108359	2.16	43	1-1/4	2-1/4	12	108579	1.81
4	2-1/2	3-3/4	12	108150	2.52	24	2	3-1/8	12	108370	2.16	44	1-1/8	2-1/8	12	108590	1.81
5	2-1/2	3-3/4	12	108161	2.52	25	1-7/8	3	12	108381	2.16	45	1-1/8	2-1/8	12	108601	1.81
6	2-1/2	3-3/4	12	108172	2.52	26	1-7/8	3	12	108392	2.16	46	1-1/8	2-1/8	12	108612	1.81
7	2-7/16	3-5/8	12	108183	2.38	27	1-7/8	3	12	108403	2.16	47	1	2	12	108623	1.81
8	2-7/16	3-5/8	12	108194	2.42	28	1-3/4	2-7/8	12	108414	2.16	48	1	2	12	108634	1.81
9	2-7/16	3-5/8	12	108205	2.42	29	1-3/4	2-7/8	12	108425	1.74	49	1	2	12	108645	1.81
10	2-7/16	3-5/8	12	108216	2.18	30	1-5/8	2-3/4	12	108436	1.74	50	1	2	12	108656	1.81
11	2-5/16	3-1/2	12	108227	2.18	31	1-5/8	2-3/4	12	108447	1.91	51	1	2	12	108667	1.81
12	2-5/16	3-1/2	12	108238	2.18	32	1-5/8	2-3/4	12	108458	1.91	52	7/8	1-7/8	12	108678	1.81
13	2-5/16	3-1/2	12	108249	2.42	33	1-1/2	2-5/8	12	108469	1.91	53	7/8	1-7/8	12	108689	1.81
14	2-3/16	3-3/8	12	108260	2.42	34	1-1/2	2-5/8	12	108480	1.91	54	7/8	1-7/8	12	108700	1.81
15	2-3/16	3-3/8	12	108271	2.42	35	1-1/2	2-5/8	12	108491	1.91	55	7/8	1-7/8	12	108711	1.81
16	2-3/16	3-3/8	12	108282	2.42	36	1-7/16	2-1/2	12	108502	1.91	56	3/4	1-3/4	12	108722	1.81
17	2-3/16	3-3/8	12	108293	2.42	37	1-7/16	2-1/2	12	108513	1.91	57	3/4	1-3/4	12	108733	1.81
18	2-1/8	3-1/4	12	108304	2.42	38	1-7/16	2-1/2	12	108524	1.91	58	11/16	1-5/8	12	108744	1.81
19	2-1/8	3-1/4	12	108315	2.29	39	1-3/8	2-3/8	12	108535	1.91	59	11/16	1-5/8	12	108755	1.81
20	2-1/8	3-1/4	12	108326	2.29	40	1-3/8	2-3/8	12	108546	1.91	60	11/16	1-5/8	12	108766	1.81

High Speed Steel Drills



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



BLACK & GOLD

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	109063	1.52	7/32	2-1/2	3-3/4	12	109173	3.07	3/8	3-5/8	5	6	109283	7.79
5/64	1	2	12	109074	1.68	15/64	2-5/8	3-7/8	12	109184	3.36	25/64	3-3/4	5-1/8	6	109294	8.45
3/32	1-1/4	2-1/4	12	109085	1.52	1/4	2-3/4	4	12	109195	3.54	13/32	3-7/8	5-1/4	6	109305	9.31
7/64	1-1/2	2-5/8	12	109096	1.57	17/64	2-7/8	4-1/8	6	109206	4.75	27/64	3-15/16	5-3/8	6	109316	9.93
1/8	1-5/8	2-3/4	12	109107	1.74	9/32	2-15/16	4-1/4	6	109217	5.12	7/16	4-1/16	5-1/2	6	109327	10.71
9/64	1-3/4	2-7/8	12	109118	1.83	19/64	3-1/16	4-3/8	6	109228	5.62	29/64	4-3/16	5-5/8	6	109338	11.39
5/32	2	3-1/8	12	109129	2.20	5/16	3-3/16	4-1/2	6	109239	5.83	15/32	4-5/16	5-3/4	6	109349	12.37
11/64	2-1/8	3-1/4	12	109140	2.33	21/64	3-5/16	4-5/8	6	109250	6.42	31/64	4-3/8	5-7/8	6	109360	13.04
3/16	2-5/16	3-1/2	12	109151	2.57	11/32	3-7/16	4-3/4	6	109261	6.88	1/2	4-1/2	6	6	109371	13.63
13/64	2-7/16	3-5/8	12	109162	2.80	23/64	3-1/2	4-7/8	6	109272	7.44	-	-	-	-	-	-

LETTER SIZES						LETTER SIZES						LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	2-5/8	3-7/8	12	110042	3.65	J	2-7/8	4-1/8	6	110141	4.49	S	3-1/2	4-7/8	6	110240	6.36
B	2-3/4	4	12	110053	3.65	K	2-15/16	4-1/4	6	110152	4.91	T	3-1/2	4-7/8	6	110251	6.67
C	2-3/4	4	12	110064	3.65	L	2-15/16	4-1/4	6	110163	5.21	U	3-5/8	5	6	110262	6.88
D	2-3/4	4	12	110075	3.65	M	3-1/16	4-3/8	6	110174	5.21	V	3-5/8	5	6	110273	7.09
E	2-3/4	4	12	110086	3.54	N	3-1/16	4-3/8	6	110185	5.21	W	3-3/4	5-1/8	6	110284	7.14
F	2-7/8	4-1/8	6	110097	3.76	O	3-3/16	4-1/2	6	110196	5.46	X	3-3/4	5-1/8	6	110295	7.83
G	2-7/8	4-1/8	6	110108	4.16	P	3-5/16	4-5/8	6	110207	5.73	Y	3-7/8	5-1/4	6	110306	8.17
H	2-7/8	4-1/8	6	110119	4.32	Q	3-7/16	4-3/4	6	110218	5.83	Z	3-7/8	5-1/4	6	110317	8.59
I	2-7/8	4-1/8	6	110130	4.32	R	3-7/16	4-3/4	6	110229	6.15	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	2-5/8	3-7/8	12	109382	3.39	21	2-1/8	3-1/4	12	109602	2.87	41	1-3/8	2-3/8	12	109822	2.20
2	2-5/8	3-7/8	12	109393	3.50	22	2	3-1/8	12	109613	2.87	42	1-1/4	2-1/4	12	109833	2.20
3	2-1/2	3-3/4	12	109404	3.54	23	2	3-1/8	12	109624	2.77	43	1-1/4	2-1/4	12	109844	2.20
4	2-1/2	3-3/4	12	109415	3.54	24	2	3-1/8	12	109635	2.77	44	1-1/8	2-1/8	12	109855	2.20
5	2-1/2	3-3/4	12	109426	3.54	25	1-7/8	3	12	109646	2.77	45	1-1/8	2-1/8	12	109866	2.20
6	2-1/2	3-3/4	12	109437	3.54	26	1-7/8	3	12	109657	2.77	46	1-1/8	2-1/8	12	109877	2.20
7	2-7/16	3-5/8	12	109448	3.13	27	1-7/8	3	12	109668	2.69	47	1	2	12	109888	2.20
8	2-7/16	3-5/8	12	109459	3.13	28	1-3/4	2-7/8	12	109679	2.69	48	1	2	12	109899	2.20
9	2-7/16	3-5/8	12	109470	3.13	29	1-3/4	2-7/8	12	109690	2.63	49	1	2	12	109910	2.20
10	2-7/16	3-5/8	12	109481	3.13	30	1-5/8	2-3/4	12	109701	2.29	50	1	2	12	109921	2.20
11	2-5/16	3-1/2	12	109492	3.13	31	1-5/8	2-3/4	12	109712	2.29	51	1	2	12	109932	2.20
12	2-5/16	3-1/2	12	109503	3.13	32	1-5/8	2-3/4	12	109723	2.29	52	7/8	1-7/8	12	109943	2.08
13	2-5/16	3-1/2	12	109514	3.13	33	1-1/2	2-5/8	12	109734	2.29	53	7/8	1-7/8	12	109954	2.08
14	2-3/16	3-3/8	12	109525	2.96	34	1-1/2	2-5/8	12	109745	2.29	54	7/8	1-7/8	12	109965	2.08
15	2-3/16	3-3/8	12	109536	2.96	35	1-1/2	2-5/8	12	109756	2.29	55	7/8	1-7/8	12	109976	2.08
16	2-3/16	3-3/8	12	109547	2.96	36	1-7/16	2-1/2	12	109767	2.20	56	3/4	1-3/4	12	109987	2.08
17	2-3/16	3-3/8	12	109558	2.96	37	1-7/16	2-1/2	12	109778	2.20	57	3/4	1-3/4	12	109998	2.08
18	2-1/8	3-1/4	12	109569	2.96	38	1-7/16	2-1/2	12	109789	2.20	58	11/16	1-5/8	12	110009	2.08
19	2-1/8	3-1/4	12	109580	2.87	39	1-3/8	2-3/8	12	109800	2.20	59	11/16	1-5/8	12	110020	2.08
20	2-1/8	3-1/4	12	109591	2.87	40	1-3/8	2-3/8	12	109811	2.20	60	11/16	1-5/8	12	110031	2.08

HSS JOBBER DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



High Speed Steel Drills

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



BLACK & GOLD

FRACTIONAL SIZES

SIZE	FLUTE LENGTH	OVERALL LENGTH	PACKAGE QUANTITY	ITEM#	LIST PRICE
1/16	7/8	1-7/8	12	110328	1.80
5/64	1	2	12	110339	1.95
3/32	1-1/4	2-1/4	12	110350	1.95
7/64	1-5/16	2-3/8	12	110361	2.01
1/8	1-7/16	2-1/2	12	110372	2.09
9/64	1-9/16	2-5/8	12	110383	2.15
5/32	1-11/16	2-3/4	12	110394	2.57
11/64	1-13/16	2-7/8	12	110405	2.63
3/16	1-7/8	3	12	110416	2.99
13/64	1-15/16	3-1/8	12	110427	3.26
7/32	2	3-1/4	12	110438	3.62
15/64	2-1/16	3-3/8	12	110449	3.89
1/4	2	3-1/2	12	110460	4.10
17/64	2-1/8	3-5/8	6	110471	5.14
9/32	2-1/4	3-3/4	6	110482	5.14
19/64	2-3/8	3-7/8	6	110493	6.12
5/16	2-1/2	4	6	110504	6.53
21/64	2-9/16	4-1/16	6	110515	6.95
11/32	2-5/8	4-1/8	6	110526	7.58
23/64	2-11/16	4-3/16	6	110537	8.06
3/8	2-11/16	4-1/4	6	110548	8.55
25/64	2-3/4	4-5/16	6	110559	9.10
13/32	2-13/16	4-3/8	6	110570	9.80
27/64	2-7/8	4-7/16	6	110581	11.05
7/16	2-15/16	4-1/2	6	110592	11.67
29/64	3	4-5/8	6	110603	12.71
15/32	3-1/8	4-3/4	6	110614	13.61
31/64	3-1/4	4-7/8	6	110625	13.90
1/2	3-3/8	5	6	110636	14.25

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

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

High Speed Steel Drills



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



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	5/8	1-5/8	12	102100	1.56	7/32	1-1/4	2-3/8	12	102210	2.36	3/8	1-13/16	3-1/8	6	102320	5.19
5/64	11/16	1-11/16	12	102111	1.57	15/64	1-5/16	2-7/16	12	102221	2.71	25/64	1-7/8	3-1/4	6	102331	5.53
3/32	3/4	1-3/4	12	102122	1.57	1/4	1-3/8	2-1/2	12	102232	2.99	13/32	1-15/16	3-5/16	6	102342	6.07
7/64	13/16	1-13/16	12	102133	1.57	17/64	1-7/16	2-5/8	6	102243	3.10	27/64	2	3-3/8	6	102353	6.40
1/8	7/8	1-7/8	12	102144	1.57	9/32	1-1/2	2-11/16	6	102254	3.25	7/16	1-1/16	3-7/16	6	102364	6.99
9/64	15/16	1-15/16	12	102155	1.57	19/64	1-9/16	2-3/4	6	102265	3.55	29/64	2-1/8	3-9/16	6	102375	7.43
5/32	1	2-1/16	12	102166	1.74	5/16	1-5/8	2-13/16	6	102276	3.76	15/32	2-1/8	3-5/8	6	102386	8.14
11/64	1-1/16	2-1/8	12	102177	1.74	21/64	1-11/16	2-15/16	6	102287	4.21	31/64	2-3/16	3-11/16	6	102397	8.45
3/16	1-1/8	2-3/16	12	102188	2.01	11/32	1-11/16	3	6	102298	4.49	1/2	2-1/4	3-3/4	6	102408	8.90
13/64	1-3/16	2-1/4	12	102199	2.08	23/64	1-3/4	3-1/16	6	102309	4.78	-	-	-	-	-	-

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	3.27	J	1-1/2	2-11/16	6	103178	5.04	S	1-3/4	3-1/16	6	103277	7.35
B	1-3/8	2-1/2	12	103090	3.43	K	1-1/2	2-11/16	6	103189	5.12	T	1-3/4	3-1/16	6	103288	7.53
C	1-3/8	2-1/2	12	103101	3.43	L	1-9/16	2-3/4	6	103200	5.24	U	1-13/16	3-1/8	6	103299	8.12
D	1-3/8	2-1/2	12	103112	3.46	M	1-9/16	2-3/4	6	103211	5.50	V	1-7/8	3-1/4	6	103310	8.64
E	1-3/8	2-1/2	12	103123	3.46	N	1-5/8	2-13/16	6	103222	5.72	W	1-7/8	3-1/4	6	103321	8.96
F	1-7/16	2-5/8	6	103134	4.44	O	1-11/16	2-15/16	6	103233	6.43	X	1-15/16	3-5/16	6	103332	9.48
G	1-7/16	2-5/8	6	103145	4.75	P	1-11/16	2-15/16	6	103244	6.60	Y	1-15/16	3-5/16	6	103343	9.68
H	1-1/2	2-11/16	6	103156	4.90	Q	1-11/16	3	6	103255	6.87	Z	2	3-3/8	6	103354	10.02
I	1-1/2	2-11/16	6	103167	4.94	R	1-11/16	3	6	103266	7.06	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	1-5/16	2-7/16	12	102419	2.71	21	1-1/16	2-1/8	12	102639	2.29	41	13/16	1-13/16	12	102859	1.74
2	1-5/16	2-7/16	12	102430	2.71	22	1-1/16	2-1/8	12	102650	2.22	42	3/4	1-3/4	12	102870	1.74
3	1-1/4	2-3/8	12	102441	2.81	23	1	2-1/16	12	102661	2.22	43	3/4	1-3/4	12	102881	1.74
4	1-1/4	2-3/8	12	102452	2.81	24	1	2-1/16	12	102672	2.22	44	3/4	1-3/4	12	102892	1.74
5	1-1/4	2-3/8	12	102463	2.81	25	1	2-1/16	12	102683	2.22	45	3/4	1-3/4	12	102903	1.74
6	1-1/4	2-3/8	12	102474	2.81	26	1	2-1/16	12	102694	2.22	46	3/4	1-3/4	12	102914	1.74
7	1-3/16	2-1/4	12	102485	2.41	27	1	2-1/16	12	102705	2.22	47	11/16	1-11/16	12	102925	1.74
8	1-3/16	2-1/4	12	102496	2.41	28	15/16	1-15/16	12	102716	2.22	48	11/16	1-11/16	12	102936	1.74
9	1-3/16	2-1/4	12	102507	2.41	29	15/16	1-15/16	12	102727	2.22	49	11/16	1-11/16	12	102947	1.74
10	1-3/16	2-1/4	12	102518	2.41	30	15/16	1-15/16	12	102738	1.74	50	11/16	1-11/16	12	102958	1.74
11	1-3/16	2-1/4	12	102529	2.41	31	7/8	1-7/8	12	102749	1.74	51	11/16	1-11/16	12	102969	1.74
12	1-3/16	2-1/4	12	102540	2.41	32	7/8	1-7/8	12	102760	1.74	52	11/16	1-11/16	12	102980	1.74
13	1-1/5	2-3/16	12	102551	2.41	33	7/8	1-7/8	12	102771	1.74	53	5/8	1-5/8	12	102991	1.74
14	1-1/8	2-3/16	12	102562	2.41	34	7/8	1-7/8	12	102782	1.74	54	5/8	1-5/8	12	103002	1.74
15	1-1/8	2-3/16	12	102573	2.41	35	7/8	1-7/8	12	102793	1.74	55	5/8	1-5/8	12	103013	1.74
16	1-1/8	2-3/16	12	102584	2.41	36	13/16	1-13/16	12	102804	1.74	56	1/2	1-3/8	12	103024	1.74
17	1-1/8	2-3/16	12	102595	2.41	37	13/16	1-13/16	12	102815	1.74	57	1/2	1-3/8	12	103035	1.74
18	1-1/16	2-1/8	12	102606	2.29	38	13/16	1-13/16	12	102826	1.74	58	1/2	1-3/8	12	103046	1.74
19	1-1/16	2-1/8	12	102617	2.29	39	13/16	1-13/16	12	102837	1.74	59	1/2	1-3/8	12	103057	1.74
20	1-1/16	2-1/8	12	102628	2.29	40	13/16	1-13/16	12	102848	1.74	60	1/2	1-3/8	12	103068	1.74

HSS SCREW MACHINE DRILLS

CARRIAGE ENDMILLS

CARRIAGE MICRO ENDMILLS

CARRIAGE THREADMILLS

CARRIAGE DRILL MILLS

CARRIAGE DRILLS

CARRIAGE REAMERS

CARRIAGE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT REAMERS

HSS & COBALT ENDMILLS



High Speed Steel Drills

TAPER LENGTH - 118° POINT



OXIDE FINISH

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

HSS TAPER LENGTH DRILLS

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/64	1-1/8	2-1/4	12	113683	4.19
1/16	1-3/4	3-3/4	12	113694	4.50
5/64	2	3-3/4	12	113705	5.23
3/32	2-1/4	4-1/4	12	113716	6.25
7/64	2-1/2	4-5/8	12	113727	7.87
1/8	2-3/4	5-1/8	12	113738	8.09
9/64	3	5-3/8	12	113749	10.81
5/32	3	5-3/8	12	113760	10.94
11/64	3-3/8	5-3/4	12	113771	11.45
3/16	3-3/8	5-3/4	12	113782	10.67
13/64	3-5/8	6	12	113793	13.02
7/32	3-5/8	6	12	113804	14.05
15/64	3-3/4	6-1/8	12	113815	14.05
1/4	3-3/4	6-1/8	12	113826	12.10
17/64	3-7/8	6-1/4	6	113837	14.69
9/32	3-7/8	6-1/4	6	113848	14.69
19/64	4	6-3/8	6	113859	16.00
5/16	4	6-3/8	6	113870	16.00
21/64	4-1/8	6-1/2	6	113881	16.00
11/32	4-1/8	6-1/2	6	113892	16.00
23/64	4-1/4	6-3/4	6	113903	18.86
3/8	4-1/4	6-3/4	6	113914	18.86
25/64	4-3/8	6-3/4	6	113925	21.46
13/32	4-3/8	7	6	113936	21.46
27/64	4-5/8	7-1/4	6	113947	22.75
7/16	4-5/8	7-1/4	6	113958	22.75
29/64	4-3/4	7-1/2	6	113969	25.89

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
15/32	4-3/4	7-1/2	6	113980	25.89
31/64	4-3/4	7-3/4	6	113991	27.39
1/2	4-3/4	7-3/4	6	114002	27.39
33/64	4-3/4	8	1	114013	36.41
17/32	4-3/4	8	1	114024	36.41
35/64	4-7/8	8-1/4	1	114035	38.23
9/16	4-7/8	8-1/4	1	114046	38.23
37/64	4-7/8	8-3/4	1	114057	44.74
19/32	4-7/8	8-3/4	1	114068	44.74
39/64	4-7/8	8-3/4	1	114079	46.36
5/8	4-7/8	8-3/4	1	114090	46.36
41/64	5-1/8	9	1	114101	52.80
21/32	5-1/8	9	1	114112	52.80
43/64	5-3/8	9-1/4	1	114123	62.43
11/16	5-3/8	9-1/4	1	114134	62.43
45/64	5-5/8	9-1/2	1	114145	65.29
23/32	5-5/8	9-1/2	1	114156	65.29
47/64	5-7/8	9-3/4	1	114167	70.23
3/4	5-7/8	9-3/4	1	114178	70.23
49/64	6	9-7/8	1	114189	76.07
25/32	6	9-7/8	1	114200	76.07
51/64	6-1/8	10	1	114211	82.13
13/16	6-1/8	10	1	114222	82.13
53/64	6-1/8	10	1	114233	86.48
27/32	6-1/8	10	1	114244	86.48
55/64	6-1/8	10	1	114255	90.77
7/8	6-1/8	10	1	114266	90.77

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
57/64	6-1/8	10	1	114277	94.61
29/32	6-1/8	10	1	114288	94.61
59/64	6-1/8	10-3/4	1	114299	102.85
15/16	6-1/8	10-3/4	1	114310	102.85
61/64	6-3/8	11	1	114321	113.52
31/32	6-3/8	11	1	114332	113.52
63/64	6-3/8	11	1	114343	118.34
1	6-3/8	11	1	114354	118.34
1-1/32	6-1/2	11-1/8	1	114365	141.73
1-1/16	6-5/8	11-1/4	1	114376	146.62
1-3/32	6-7/8	11-1/2	1	114387	157.27
1-1/8	7-1/8	11-3/4	1	114398	163.21
1-5/32	7-1/4	11-7/8	1	114409	177.66
1-3/16	7-3/8	12	1	114420	191.29
1-7/32	7-1/2	12-1/8	1	114431	196.98
1-1/4	7-7/8	12-1/2	1	114442	204.89
1-9/32	8-1/2	14-1/8	1	114453	244.46
1-5/16	8-5/8	14-1/4	1	114464	244.46
1-11/32	8-3/4	14-3/8	1	114475	262.18
1-3/8	8-7/8	14-1/2	1	114486	262.18
1-13/32	9	14-5/8	1	114497	298.57
1-7/16	9-1/8	14-3/4	1	114508	311.58
1-15/32	9-1/4	14-7/8	1	114519	320.30
1-1/2	9-3/8	15	1	114530	320.30
1-9/16	9-5/8	15-1/4	1	114541	358.38
1-5/8	9-7/8	15-5/8	1	114552	404.71
1-3/4	10-1/2	16-1/4	1	114563	487.65

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	3-3/4	6-1/8	12	114574	14.73
2	3-3/4	6-1/8	12	114585	14.73
3	3-5/8	6	12	114596	14.25
4	3-5/8	6	12	114607	14.25
5	3-5/8	6	12	114618	14.25
6	3-5/8	6	12	114629	14.25
7	3-5/8	6	12	114640	14.25
8	3-5/8	6	12	114651	14.25
9	3-5/8	6	12	114662	14.25
10	3-5/8	6	12	114673	14.25
11	3-5/8	6	12	114684	14.25
12	3-5/8	6	12	114695	14.25
13	3-3/8	5-3/4	12	114706	12.94
14	3-3/8	5-3/4	12	114717	12.94

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
15	3-3/8	5-3/4	12	114728	12.94
16	3-3/8	5-3/4	12	114739	12.94
17	3-3/8	5-3/4	12	114750	12.94
18	3-3/8	5-3/4	12	114761	12.94
19	3-3/8	5-3/4	12	114772	12.94
20	3-3/8	5-3/4	12	114783	12.94
21	3-3/8	5-3/4	12	114794	12.94
22	3-3/8	5-3/4	12	114805	12.94
23	3	5-3/8	12	114816	12.94
24	3	5-3/8	12	114827	12.94
25	3	5-3/8	12	114838	12.94
26	3	5-3/8	12	114849	12.94
27	3	5-3/8	12	114860	12.94
28	3	5-3/8	12	114871	12.94

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
29	3	5-3/8	12	114882	12.94
30	3	5-3/8	12	114893	12.94
31	2-3/4	5-1/8	12	114904	12.68
32	2-3/4	5-1/8	12	114915	12.68
33	2-3/4	5-1/8	12	114926	12.68
34	2-3/4	5-1/8	12	114937	12.68
35	2-3/4	5-1/8	12	114948	12.68
36	2-1/2	4-5/8	12	114959	9.49
37	2-1/2	4-5/8	12	114970	9.49
38	2-1/2	4-5/8	12	114981	9.49
39	2-1/2	4-5/8	12	114992	8.31
40	2-1/2	4-5/8	12	115003	8.31
-	-	-	-	-	-
-	-	-	-	-	-

High Speed Steel Drills



TAPER SHANK - 118° POINT



OXIDE FINISH

FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	MORSE TAPER #	FLUTE LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE	SIZE	MORSE TAPER #	FLUTE LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
3/16	#1	2-1/2	5-3/4	115201	28.62	13/16	#3	6-1/8	10-3/4	115641	95.90
13/64	#1	2-3/4	6	115212	28.62	53/64	#3	6-1/8	10-3/4	115652	106.26
7/32	#1	2-3/4	6	115223	28.62	27/32	#3	6-1/8	10-3/4	115663	103.39
15/64	#1	2-7/8	6-1/8	115234	28.62	55/64	#3	6-1/8	10-3/4	115674	116.65
1/4	#1	2-7/8	6-1/8	115245	28.62	7/8	#3	6-1/8	10-3/4	115685	106.52
17/64	#1	3	6-1/4	115256	28.62	57/64	#3	6-1/8	10-3/4	115696	112.49
9/32	#1	3	6-1/4	115267	28.62	29/32	#3	6-1/8	10-3/4	115707	112.49
19/64	#1	3-1/8	6-3/8	115278	30.30	59/64	#3	6-1/8	10-3/4	115718	114.06
5/16	#1	3-1/8	6-3/8	115289	31.87	15/16	#3	6-1/8	10-3/4	115729	106.90
21/64	#1	3-1/4	6-1/2	115300	31.87	61/64	#3	6-3/8	11	115740	117.17
11/32	#1	3-1/4	6-1/2	115311	31.87	31/32	#3	6-3/8	11	115751	116.38
23/64	#1	3-1/2	6-3/4	115322	32.51	63/64	#3	6-3/8	11	115762	124.32
3/8	#1	3-1/2	6-3/4	115333	32.51	1	#3	6-3/8	11	115773	118.34
25/64	#1	3-5/8	7	115344	38.64	1-1/64	#3	6-1/2	11-1/8	115784	137.58
13/32	#1	3-5/8	7	115355	38.64	1-1/32	#3	6-1/2	11-1/8	115795	136.55
27/64	#1	3-7/8	7-1/4	115366	41.61	1-3/64	#3	6-5/8	11-1/4	115806	143.05
7/16	#1	3-7/8	7-1/4	115377	41.61	1-1/16	#3	6-5/8	11-1/4	115817	136.55
29/64	#1	4-1/8	7-1/2	115388	41.61	1-5/64	#4	6-7/8	12-1/2	115828	162.55
15/32	#2	4-1/8	7-1/2	115399	41.61	1-3/32	#4	6-7/8	12-1/2	115839	162.55
31/64	#2	4-3/8	8-1/4	115410	45.52	1-7/64	#4	7-1/8	12-3/4	115850	169.06
1/2	#2	4-3/8	8-1/4	115421	42.59	1-1/8	#4	7-1/8	12-3/4	115861	169.06
33/64	#2	4-5/8	8-1/2	115432	49.09	1-9/64	#4	7-1/4	12-7/8	115872	182.06
17/32	#2	4-5/8	8-1/2	115443	50.71	1-5/32	#4	7-1/4	12-7/8	115883	175.56
35/64	#2	4-7/8	8-3/4	115454	53.44	1-11/64	#4	7-3/8	13	115894	182.06
9/16	#2	4-7/8	8-3/4	115465	52.02	1-3/16	#4	7-3/8	13	115905	182.06
37/64	#2	4-7/8	8-3/4	115476	56.89	1-13/64	#4	7-1/2	13-1/8	115916	195.06
19/32	#2	4-7/8	8-3/4	115487	55.92	1-7/32	#4	7-1/2	13-1/8	115927	195.06
39/64	#2	4-7/8	8-3/4	115498	59.17	1-1/4	#4	7-7/8	13-1/2	115949	204.18
5/8	#2	4-7/8	8-3/4	115509	56.57	1-5/16	#4	8-5/8	14-1/4	115982	250.99
41/64	#2	5-1/8	9	115520	65.03	1-3/8	#4	8-7/8	14-1/2	116004	267.89
21/32	#2	5-1/8	9	115531	63.72	1-7/16	#4	9-1/8	14-3/4	116026	293.90
43/64	#2	5-3/8	9-1/4	115542	70.23	1-1/2	#4	9-3/8	15	116048	308.21
11/16	#2	5-3/8	9-1/4	115553	66.31	1-9/16	#5	9-5/8	16-5/8	116070	375.82
45/64	#2	5-5/8	9-1/2	115564	72.82	1-5/8	#5	10	17	116092	405.75
23/32	#2	5-5/8	9-1/2	115575	70.35	1-11/16	#5	10-1/8	17-1/8	116114	447.35
47/64	#2	5-7/8	9-3/4	115586	78.04	1-3/4	#5	10-1/8	17-1/8	116136	475.97
3/4	#2	5-7/8	9-3/4	115597	77.39	1-13/16	#5	10-1/8	17-1/8	116158	511.08
49/64	#2	6	9-7/8	115608	93.25	1-7/8	#5	10-3/8	17-3/8	116180	533.18
25/32	#2	6	9-7/8	115619	92.73	1-15/16	#5	10-3/8	17-3/8	116202	574.80
51/64	#3	6-1/8	10-3/4	115630	102.09	2	#5	10-3/8	17-3/8	116224	595.60

HSS TAPER SHANK DRILLS

CARRIIDE ENDMILLS

CARRIIDE MICRO ENDMILLS

CARRIIDE THREADMILLS

CARRIIDE DRILL MILLS

CARRIIDE DRILLS

CARRIIDE REAMERS

CARRIIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



M42 Cobalt Drills

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



**NAS 907 - M42 COBALT
STRAW FINISH**

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

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	1.93	7/32	1-1/4	2-3/8	12	103475	4.65	3/8	1-13/16	3-1/8	6	103585	11.02		
5/64	11/16	1-11/16	12	103376	1.93	15/64	1-5/16	2-7/16	12	103486	4.99	25/64	1-7/8	3-1/4	6	103596	12.61		
3/32	3/4	1-3/4	12	103387	1.93	1/4	1-3/8	2-1/2	12	103497	5.18	13/32	1-15/16	3-5/16	6	103607	13.02		
7/64	13/16	1-13/16	12	103398	2.18	17/64	1-7/16	2-5/8	6	103508	5.91	27/64	2	3-3/8	6	103618	14.42		
1/8	7/8	1-7/8	12	103409	2.53	9/32	1-1/2	2-11/16	6	103519	6.43	7/16	1-1/16	3-7/16	6	103629	14.82		
9/64	15/16	1-15/16	12	103420	2.53	19/64	1-9/16	2-3/4	6	103530	7.44	29/64	2-1/8	3-9/16	6	103640	17.79		
5/32	1	2-1/16	12	103431	2.78	5/16	1-5/8	2-13/16	6	103541	7.98	15/32	2-1/8	3-5/8	6	103651	17.79		
11/64	1-1/16	2-1/8	12	103442	3.13	21/64	1-11/16	2-15/16	6	103552	8.85	31/64	2-3/16	3-11/16	6	103662	17.79		
3/16	1-1/8	2-3/16	12	103453	3.68	11/32	1-11/16	3	6	103563	9.58	1/2	2-1/4	3-3/4	6	103673	17.79		
13/64	1-3/16	2-1/4	12	103464	4.20	23/64	1-3/4	3-1/16	6	103574	11.02	-	-	-	-	-	-	-	-

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	5.93	J	1-1/2	2-11/16	6	104443	7.09	S	1-3/4	3-1/16	6	104542	13.46		
B	1-3/8	2-1/2	12	104355	6.31	K	1-1/2	2-11/16	6	104454	7.09	T	1-3/4	3-1/16	6	104553	13.46		
C	1-3/8	2-1/2	12	104366	6.31	L	1-9/16	2-3/4	6	104465	8.40	U	1-13/16	3-1/8	6	104564	13.46		
D	1-3/8	2-1/2	12	104377	6.31	M	1-9/16	2-3/4	6	104476	8.40	V	1-7/8	3-1/4	6	104575	14.93		
E	1-3/8	2-1/2	12	104388	5.76	N	1-5/8	2-13/16	6	104487	9.02	W	1-7/8	3-1/4	6	104586	14.93		
F	1-7/16	2-5/8	6	104399	6.67	O	1-11/16	2-15/16	6	104498	10.00	X	1-15/16	3-5/16	6	104597	14.93		
G	1-7/16	2-5/8	6	104410	6.67	P	1-11/16	2-15/16	6	104509	10.00	Y	1-15/16	3-5/16	6	104608	14.93		
H	1-1/2	2-11/16	6	104421	7.09	Q	1-11/16	3	6	104520	10.81	Z	2	3-3/8	6	104619	17.13		
I	1-1/2	2-11/16	6	104432	7.09	R	1-11/16	3	6	104531	10.81	-	-	-	-	-	-	-	-

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	5.72	21	1-1/16	2-1/8	12	103904	2.97	41	13/16	1-13/16	12	104124	2.02
2	1-5/16	2-7/16	12	103695	5.72	22	1-1/16	2-1/8	12	103915	2.97	42	3/4	1-3/4	12	104135	1.99
3	1-1/4	2-3/8	12	103706	5.72	23	1	2-1/16	12	103926	2.97	43	3/4	1-3/4	12	104146	1.99
4	1-1/4	2-3/8	12	103717	5.10	24	1	2-1/16	12	103937	2.97	44	3/4	1-3/4	12	104157	1.99
5	1-1/4	2-3/8	12	103728	5.10	25	1	2-1/16	12	103948	2.78	45	3/4	1-3/4	12	104168	1.99
6	1-1/4	2-3/8	12	103739	5.10	26	1	2-1/16	12	103959	2.78	46	3/4	1-3/4	12	104179	1.99
7	1-3/16	2-1/4	12	103750	4.01	27	1	2-1/16	12	103970	2.78	47	11/16	1-11/16	12	104190	1.99
8	1-3/16	2-1/4	12	103761	4.01	28	15/16	1-15/16	12	103981	2.53	48	11/16	1-11/16	12	104201	1.99
9	1-3/16	2-1/4	12	103772	4.01	29	15/16	1-15/16	12	103992	2.53	49	11/16	1-11/16	12	104212	1.99
10	1-3/16	2-1/4	12	103783	4.01	30	15/16	1-15/16	12	104003	2.39	50	11/16	1-11/16	12	104223	1.99
11	1-3/16	2-1/4	12	103794	3.90	31	7/8	1-7/8	12	104014	2.39	51	11/16	1-11/16	12	104234	1.99
12	1-3/16	2-1/4	12	103805	3.90	32	7/8	1-7/8	12	104025	2.39	52	11/16	1-11/16	12	104245	1.99
13	1-1/5	2-3/16	12	103816	3.83	33	7/8	1-7/8	12	104036	2.30	53	5/8	1-5/8	12	104256	2.24
14	1-1/8	2-3/16	12	103827	3.83	34	7/8	1-7/8	12	104047	2.30	54	5/8	1-5/8	12	104267	2.24
15	1-1/8	2-3/16	12	103838	3.83	35	7/8	1-7/8	12	104058	2.30	55	5/8	1-5/8	12	104278	2.24
16	1-1/8	2-3/16	12	103849	3.81	36	13/16	1-13/16	12	104069	2.30	56	1/2	1-3/8	12	104289	2.24
17	1-1/8	2-3/16	12	103860	3.68	37	13/16	1-13/16	12	104080	2.30	57	1/2	1-3/8	12	104300	2.24
18	1-1/16	2-1/8	12	103871	3.13	38	13/16	1-13/16	12	104091	2.09	58	1/2	1-3/8	12	104311	2.39
19	1-1/16	2-1/8	12	103882	2.97	39	13/16	1-13/16	12	104102	2.09	59	1/2	1-3/8	12	104322	2.39
20	1-1/16	2-1/8	12	103893	2.97	40	13/16	1-13/16	12	104113	2.09	60	1/2	1-3/8	12	104333	2.39

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

M42 Cobalt Drills



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



**NAS 907 - M42 COBALT
ALTIN COATED**

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1/16	5/8	1-5/8	12	233990	3.41
5/64	11/16	1-11/16	12	234001	3.41
3/32	3/4	1-3/4	12	234012	3.41
7/64	13/16	1-13/16	12	234023	3.87
1/8	7/8	1-7/8	12	234034	4.49
9/64	15/16	1-15/16	12	234045	4.49
5/32	1	2-1/16	12	234056	4.93
11/64	1-1/16	2-1/8	12	234067	5.54
3/16	1-1/8	2-3/16	12	234078	6.53
13/64	1-3/16	2-1/4	12	234089	7.45

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
7/32	1-1/4	2-3/8	12	234100	8.23
15/64	1-5/16	2-7/16	12	234111	8.85
1/4	1-3/8	2-1/2	12	234122	9.19
17/64	1-7/16	2-5/8	6	234133	10.49
9/32	1-1/2	2-11/16	6	234144	11.40
19/64	1-9/16	2-3/4	6	234155	13.19
5/16	1-5/8	2-13/16	6	234166	14.15
21/64	1-11/16	2-15/16	6	234177	15.70
11/32	1-11/16	3	6	234188	16.97
23/64	1-3/4	3-1/16	6	234199	19.53

FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/8	1-13/16	3-1/8	6	234210	19.53
25/64	1-7/8	3-1/4	6	234221	22.35
13/32	1-15/16	3-5/16	6	234232	23.08
27/64	2	3-3/8	6	234243	25.56
7/16	1-1/16	3-7/16	6	234254	26.28
29/64	2-1/8	3-9/16	6	234265	31.54
15/32	2-1/8	3-5/8	6	234276	31.54
31/64	2-3/16	3-11/16	6	234287	31.54
1/2	2-1/4	3-3/4	6	234298	31.54
-	-	-	-	-	-

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
A	1-5/16	2-7/16	12	234969	10.52
B	1-3/8	2-1/2	12	234980	11.19
C	1-3/8	2-1/2	12	234991	11.19
D	1-3/8	2-1/2	12	235002	11.19
E	1-3/8	2-1/2	12	235013	10.22
F	1-7/16	2-5/8	6	235024	11.84
G	1-7/16	2-5/8	6	235035	11.84
H	1-1/2	2-11/16	6	235046	12.57
I	1-1/2	2-11/16	6	235057	12.57

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
J	1-1/2	2-11/16	6	235068	12.57
K	1-1/2	2-11/16	6	235079	12.57
L	1-9/16	2-3/4	6	235090	14.90
M	1-9/16	2-3/4	6	235101	14.90
N	1-5/8	2-13/16	6	235112	15.98
O	1-11/16	2-15/16	6	235123	17.73
P	1-11/16	2-15/16	6	235134	17.73
Q	1-11/16	3	6	235145	19.16
R	1-11/16	3	6	235156	19.16

LETTER SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
S	1-3/4	3-1/16	6	235167	23.86
T	1-3/4	3-1/16	6	235178	23.86
U	1-13/16	3-1/8	6	235189	23.86
V	1-7/8	3-1/4	6	235200	26.46
W	1-7/8	3-1/4	6	235211	26.46
X	1-15/16	3-5/16	6	235222	26.46
Y	1-15/16	3-5/16	6	235233	26.46
Z	2	3-3/8	6	235244	30.36
-	-	-	-	-	-

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
1	1-5/16	2-7/16	12	234309	10.13
2	1-5/16	2-7/16	12	234320	10.13
3	1-1/4	2-3/8	12	234331	10.13
4	1-1/4	2-3/8	12	234342	9.05
5	1-1/4	2-3/8	12	234353	9.05
6	1-1/4	2-3/8	12	234364	9.05
7	1-3/16	2-1/4	12	234375	7.11
8	1-3/16	2-1/4	12	234386	7.11
9	1-3/16	2-1/4	12	234397	7.11
10	1-3/16	2-1/4	12	234408	7.11
11	1-3/16	2-1/4	12	234419	6.91
12	1-3/16	2-1/4	12	234430	6.91
13	1-1/5	2-3/16	12	234441	6.79
14	1-1/8	2-3/16	12	234452	6.79
15	1-1/8	2-3/16	12	234463	6.79
16	1-1/8	2-3/16	12	234474	6.75
17	1-1/8	2-3/16	12	234485	6.53
18	1-1/16	2-1/8	12	234496	5.54
19	1-1/16	2-1/8	12	234507	5.27
20	1-1/16	2-1/8	12	234518	5.27

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
21	1-1/16	2-1/8	12	234529	5.27
22	1-1/16	2-1/8	12	234540	5.27
23	1	2-1/16	12	234551	5.27
24	1	2-1/16	12	234562	5.27
25	1	2-1/16	12	234573	4.93
26	1	2-1/16	12	234584	4.93
27	1	2-1/16	12	234595	4.93
28	15/16	1-15/16	12	234606	4.49
29	15/16	1-15/16	12	234617	4.49
30	15/16	1-15/16	12	234628	4.23
31	7/8	1-7/8	12	234639	4.23
32	7/8	1-7/8	12	234650	4.23
33	7/8	1-7/8	12	234661	4.09
34	7/8	1-7/8	12	234672	4.09
35	7/8	1-7/8	12	234683	4.09
36	13/16	1-13/16	12	234694	4.09
37	13/16	1-13/16	12	234705	4.09
38	13/16	1-13/16	12	234716	3.71
39	13/16	1-13/16	12	234727	3.71
40	13/16	1-13/16	12	234738	3.71

WIRE SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
41	13/16	1-13/16	12	234749	3.58
42	3/4	1-3/4	12	234760	3.53
43	3/4	1-3/4	12	234771	3.53
44	3/4	1-3/4	12	234782	3.53
45	3/4	1-3/4	12	234793	3.53
46	3/4	1-3/4	12	234804	3.53
47	11/16	1-11/16	12	234815	3.53
48	11/16	1-11/16	12	234826	3.53
49	11/16	1-11/16	12	234837	3.53
50	11/16	1-11/16	12	234848	3.53
51	11/16	1-11/16	12	234859	3.53
52	11/16	1-11/16	12	234870	3.53
53	5/8	1-5/8	12	234881	3.97
54	5/8	1-5/8	12	234892	3.97
55	5/8	1-5/8	12	234903	3.97
56	1/2	1-3/8	12	234914	3.97
57	1/2	1-3/8	12	234925	3.97
58	1/2	1-3/8	12	234936	4.23
59	1/2	1-3/8	12	234947	4.23
60	1/2	1-3/8	12	234958	4.23

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

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

COBALT SCREW MACHINE DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

TAPS & DIES

COUNTERSINKS

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



M42 Cobalt Drills

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



**NAS 907 - M42 COBALT
STRAW FINISH**

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

COBALT JOBBER DRILLS

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES					
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE
3/64	3/4	1-3/4	12	111912	2.94	13/64	2-7/16	3-5/8	12	112022	4.57	23/64	3-1/2	4-7/8	6	112132	12.22
1/16	7/8	1-7/8	12	111923	2.22	7/32	2-1/2	3-3/4	12	112033	5.01	3/8	3-5/8	5	6	112143	12.22
5/64	1	2	12	111934	2.22	15/64	2-5/8	3-7/8	12	112044	5.33	25/64	3-3/4	5-1/8	6	112154	13.89
3/32	1-1/4	2-1/4	12	111945	2.22	1/4	2-3/4	4	12	112055	5.70	13/32	3-7/8	5-1/4	6	112165	14.49
7/64	1-1/2	2-5/8	12	111956	2.34	17/64	2-7/8	4-1/8	6	112066	6.45	27/64	3-15/16	5-3/8	6	112176	16.02
1/8	1-5/8	2-3/4	12	111967	2.88	9/32	2-15/16	4-1/4	6	112077	6.77	7/16	4-1/16	5-1/2	6	112187	16.39
9/64	1-3/4	2-7/8	12	111978	2.88	19/64	3-1/16	4-3/8	6	112088	8.24	29/64	4-3/16	5-5/8	6	112198	19.67
5/32	2	3-1/8	12	111989	3.23	5/16	3-3/16	4-1/2	6	112099	8.77	15/32	4-5/16	5-3/4	6	112209	20.04
11/64	2-1/8	3-1/4	12	112000	3.41	21/64	3-5/16	4-5/8	6	112110	9.71	31/64	4-3/8	5-7/8	6	112220	20.14
3/16	2-5/16	3-1/2	12	112011	3.81	11/32	3-7/16	4-3/4	6	112121	10.66	1/2	4-1/2	6	6	112231	20.14

LETTER SIZES						LETTER SIZES						LETTER SIZES							
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE		
A	2-5/8	3-7/8	12	113122	6.03	J	2-7/8	4-1/8	6	113221	7.83	S	3-1/2	4-7/8	6	113320	14.08		
B	2-3/4	4	12	113133	6.95	K	2-15/16	4-1/4	6	113232	7.83	T	3-1/2	4-7/8	6	113331	14.08		
C	2-3/4	4	12	113144	6.95	L	2-15/16	4-1/4	6	113243	8.89	U	3-5/8	5	6	113342	14.08		
D	2-3/4	4	12	113155	7.83	M	3-1/16	4-3/8	6	113254	9.43	V	3-5/8	5	6	113353	15.52		
E	2-3/4	4	12	113166	5.70	N	3-1/16	4-3/8	6	113265	9.43	W	3-3/4	5-1/8	6	113364	15.52		
F	2-7/8	4-1/8	6	113177	6.95	O	3-3/16	4-1/2	6	113276	10.42	X	3-3/4	5-1/8	6	113375	15.52		
G	2-7/8	4-1/8	6	113188	6.95	P	3-5/16	4-5/8	6	113287	11.07	Y	3-7/8	5-1/4	6	113386	16.44		
H	2-7/8	4-1/8	6	113199	7.83	Q	3-7/16	4-3/4	6	113298	11.48	Z	3-7/8	5-1/4	6	113397	17.89		
I	2-7/8	4-1/8	6	113210	7.83	R	3-7/16	4-3/4	6	113309	11.48	-	-	-	-	-	-	-	-

WIRE SIZES						WIRE SIZES						WIRE SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
1	2-5/8	3-7/8	12	112242	6.10	28	1-3/4	2-7/8	12	112539	2.90	55	7/8	1-7/8	12	112836	2.47	
2	2-5/8	3-7/8	12	112253	6.10	29	1-3/4	2-7/8	12	112550	2.81	56	3/4	1-3/4	12	112847	2.79	
3	2-1/2	3-3/4	12	112264	5.70	30	1-5/8	2-3/4	12	112561	2.65	57	3/4	1-3/4	12	112858	2.79	
4	2-1/2	3-3/4	12	112275	5.70	31	1-5/8	2-3/4	12	112572	2.59	58	11/16	1-5/8	12	112869	2.79	
5	2-1/2	3-3/4	12	112286	5.70	32	1-5/8	2-3/4	12	112583	2.55	59	11/16	1-5/8	12	112880	2.79	
6	2-1/2	3-3/4	12	112297	5.70	33	1-1/2	2-5/8	12	112594	2.46	60	11/16	1-5/8	12	112891	2.79	
7	2-7/16	3-5/8	12	112308	4.44	34	1-1/2	2-5/8	12	112605	2.46	61	11/16	1-5/8	12	112902	2.97	
8	2-7/16	3-5/8	12	112319	4.44	35	1-1/2	2-5/8	12	112616	2.46	62	5/8	1-1/2	12	112913	2.97	
9	2-7/16	3-5/8	12	112330	4.44	36	1-7/16	2-1/2	12	112627	2.44	63	5/8	1-1/2	12	112924	2.97	
10	2-7/16	3-5/8	12	112341	4.44	37	1-7/16	2-1/2	12	112638	2.44	64	5/8	1-1/2	12	112935	2.97	
11	2-5/16	3-1/2	12	112352	4.44	38	1-7/16	2-1/2	12	112649	2.25	65	5/8	1-1/2	12	112946	2.97	
12	2-5/16	3-1/2	12	112363	4.44	39	1-3/8	2-3/8	12	112660	2.25	66	1/2	1-3/8	12	112957	3.23	
13	2-5/16	3-1/2	12	112374	4.36	40	1-3/8	2-3/8	12	112671	2.25	67	1/2	1-3/8	12	112968	3.23	
14	2-3/16	3-3/8	12	112385	4.36	41	1-3/8	2-3/8	12	112682	2.22	68	1/2	1-3/8	12	112979	3.23	
15	2-3/16	3-3/8	12	112396	4.36	42	1-1/4	2-1/4	12	112693	2.20	69	1/2	1-3/8	12	112990	3.23	
16	2-3/16	3-3/8	12	112407	3.97	43	1-1/4	2-1/4	12	112704	2.20	70	3/8	1-1/4	12	113001	3.23	
17	2-3/16	3-3/8	12	112418	3.88	44	1-1/8	2-1/8	12	112715	2.20	71	3/8	1-1/4	12	113012	3.23	
18	2-1/8	3-1/4	12	112429	3.55	45	1-1/8	2-1/8	12	112726	2.20	72	5/16	1-1/8	12	113023	3.23	
19	2-1/8	3-1/4	12	112440	3.44	46	1-1/8	2-1/8	12	112737	2.20	73	5/16	1-1/8	12	113034	3.23	
20	2-1/8	3-1/4	12	112451	3.44	47	1	2	12	112748	2.20	74	1/4	1	12	113045	3.23	
21	2-1/8	3-1/4	12	112462	3.42	48	1	2	12	112759	2.20	75	1/4	1	12	113056	3.38	
22	2	3-1/8	12	112473	3.42	49	1	2	12	112770	2.20	76	3/16	7/8	12	113067	3.38	
23	2	3-1/8	12	112484	3.42	50	1	2	12	112781	2.20	77	3/16	7/8	12	113078	3.38	
24	2	3-1/8	12	112495	3.42	51	1	2	12	112792	2.20	78	3/16	7/8	12	113089	3.38	
25	1-7/8	3	12	112506	3.13	52	7/8	1-7/8	12	112803	2.20	79	1/8	3/4	12	113100	3.38	
26	1-7/8	3	12	112517	3.10	53	7/8	1-7/8	12	112814	2.47	80	1/8	3/4	12	113111	3.38	
27	1-7/8	3	12	112528	3.10	54	7/8	1-7/8	12	112825	2.47	-	-	-	-	-	-	-

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

M42 Cobalt Drills



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



**NAS 907 - M42 COBALT
ALTiN COATED**

FRACTIONAL SIZES						FRACTIONAL SIZES						FRACTIONAL SIZES						
SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	SIZE	FLUTE LENGTH	O.A.L.	PKG. QTY.	ITEM#	LIST PRICE	
1/16	7/8	1-7/8	12	235266	3.93	7/32	2-1/2	3-3/4	12	235376	8.88	3/8	3-5/8	5	6	235486	21.66	
5/64	1	2	12	235277	3.93	15/64	2-5/8	3-7/8	12	235387	9.43	25/64	3-3/4	5-1/8	6	235497	24.62	
3/32	1-1/4	2-1/4	12	235288	3.93	1/4	2-3/4	4	12	235398	10.10	13/32	3-7/8	5-1/4	6	235508	25.70	
7/64	1-1/2	2-5/8	12	235299	4.15	17/64	2-7/8	4-1/8	6	235409	11.43	27/64	3-15/16	5-3/8	6	235519	28.41	
1/8	1-5/8	2-3/4	12	235310	5.10	9/32	2-15/16	4-1/4	6	235420	12.00	7/16	4-1/16	5-1/2	6	235530	29.06	
9/64	1-3/4	2-7/8	12	235321	5.10	19/64	3-1/16	4-3/8	6	235431	14.61	29/64	4-3/16	5-5/8	6	235541	34.87	
5/32	2	3-1/8	12	235332	5.72	5/16	3-3/16	4-1/2	6	235442	15.54	15/32	4-5/16	5-3/4	6	235552	35.53	
11/64	2-1/8	3-1/4	12	235343	6.03	21/64	3-5/16	4-5/8	6	235453	17.21	31/64	4-3/8	5-7/8	6	235563	35.71	
3/16	2-5/16	3-1/2	12	235354	6.75	11/32	3-7/16	4-3/4	6	235464	18.90	1/2	4-1/2	6	6	235574	35.71	
13/64	2-7/16	3-5/8	12	235365	8.12	23/64	3-1/2	4-7/8	6	235475	21.66	-	-	-	-	-	-	-

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	10.68	J	2-7/8	4-1/8	6	236344	13.87	S	3-1/2	4-7/8	6	236443	24.97	
B	2-3/4	4	12	236256	12.31	K	2-15/16	4-1/4	6	236355	13.87	T	3-1/2	4-7/8	6	236454	24.97	
C	2-3/4	4	12	236267	12.31	L	2-15/16	4-1/4	6	236366	15.76	U	3-5/8	5	6	236465	24.97	
D	2-3/4	4	12	236278	13.87	M	3-1/16	4-3/8	6	236377	16.71	V	3-5/8	5	6	236476	27.51	
E	2-3/4	4	12	236289	10.10	N	3-1/16	4-3/8	6	236388	16.71	W	3-3/4	5-1/8	6	236487	27.51	
F	2-7/8	4-1/8	6	236300	12.31	O	3-3/16	4-1/2	6	236399	18.48	X	3-3/4	5-1/8	6	236498	27.51	
G	2-7/8	4-1/8	6	236311	12.31	P	3-5/16	4-5/8	6	236410	19.63	Y	3-7/8	5-1/4	6	236509	29.14	
H	2-7/8	4-1/8	6	236322	13.87	Q	3-7/16	4-3/4	6	236421	20.34	Z	3-7/8	5-1/4	6	236520	31.71	
I	2-7/8	4-1/8	6	236333	13.87	R	3-7/16	4-3/4	6	236432	20.34	-	-	-	-	-	-	-

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	10.82	21	2-1/8	3-1/4	12	235805	6.07	41	1-3/8	2-3/8	12	236025	3.93
2	2-5/8	3-7/8	12	235596	10.82	22	2	3-1/8	12	235816	6.07	42	1-1/4	2-1/4	12	236036	3.91
3	2-1/2	3-3/4	12	235607	10.12	23	2	3-1/8	12	235827	6.07	43	1-1/4	2-1/4	12	236047	3.91
4	2-1/2	3-3/4	12	235618	10.12	24	2	3-1/8	12	235838	6.07	44	1-1/8	2-1/8	12	236058	3.91
5	2-1/2	3-3/4	12	235629	10.12	25	1-7/8	3	12	235849	5.54	45	1-1/8	2-1/8	12	236069	3.91
6	2-1/2	3-3/4	12	235640	10.12	26	1-7/8	3	12	235860	5.48	46	1-1/8	2-1/8	12	236080	3.91
7	2-7/16	3-5/8	12	235651	7.88	27	1-7/8	3	12	235871	5.48	47	1	2	12	236091	3.91
8	2-7/16	3-5/8	12	235662	7.88	28	1-3/4	2-7/8	12	235882	5.14	48	1	2	12	236102	3.91
9	2-7/16	3-5/8	12	235673	7.88	29	1-3/4	2-7/8	12	235893	4.98	49	1	2	12	236113	3.91
10	2-7/16	3-5/8	12	235684	7.88	30	1-5/8	2-3/4	12	235904	4.68	50	1	2	12	236124	3.91
11	2-5/16	3-1/2	12	235695	7.88	31	1-5/8	2-3/4	12	235915	4.59	51	1	2	12	236135	3.91
12	2-5/16	3-1/2	12	235706	7.88	32	1-5/8	2-3/4	12	235926	4.52	52	7/8	1-7/8	12	236146	3.91
13	2-5/16	3-1/2	12	235717	7.74	33	1-1/2	2-5/8	12	235937	4.36	53	7/8	1-7/8	12	236157	4.37
14	2-3/16	3-3/8	12	235728	7.74	34	1-1/2	2-5/8	12	235948	4.36	54	7/8	1-7/8	12	236168	4.37
15	2-3/16	3-3/8	12	235739	7.74	35	1-1/2	2-5/8	12	235959	4.36	55	7/8	1-7/8	12	236179	4.37
16	2-3/16	3-3/8	12	235750	7.04	36	1-7/16	2-1/2	12	235970	4.31	56	3/4	1-3/4	12	236190	4.94
17	2-3/16	3-3/8	12	235761	6.88	37	1-7/16	2-1/2	12	235981	4.31	57	3/4	1-3/4	12	236201	4.94
18	2-1/8	3-1/4	12	235772	6.29	38	1-7/16	2-1/2	12	235992	3.99	58	11/16	1-5/8	12	236212	4.94
19	2-1/8	3-1/4	12	235783	6.10	39	1-3/8	2-3/8	12	236003	3.99	59	11/16	1-5/8	12	236223	4.94
20	2-1/8	3-1/4	12	235794	6.10	40	1-3/8	2-3/8	12	236014	3.99	60	11/16	1-5/8	12	236234	4.94

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

NOTE: ALL COBALT DRILLS HAVE IDENTIFICATION RING ON SHANK

COBALT JOBBER DRILLS



Silver & Deming Drills



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



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



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



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

SIZE	OVERALL LENGTH	HSS	LIST PRICE	HSS 3 FLATS	LIST PRICE	BLK & GOLD	LIST PRICE	COBALT	LIST PRICE
33/64	6	120591	25.46	121075	27.77	121779	32.53	121427	50.67
17/32	6	120602	25.46	121086	27.77	121790	32.53	121438	50.67
35/64	6	120613	26.90	121097	29.52	121801	34.44	121449	60.97
9/16	6	120624	26.90	121108	29.52	121812	34.44	121460	60.97
37/64	6	120635	28.86	121119	31.71	121823	36.56	121471	63.03
19/32	6	120646	28.86	121130	31.71	121834	36.56	121482	63.03
39/64	6	120657	30.34	121141	33.20	121845	38.02	121493	64.65
5/8	6	120668	30.34	121152	33.20	121856	38.02	121504	64.65
41/64	6	120679	31.77	121163	35.41	121867	40.32	121515	67.82
21/32	6	120690	31.77	121174	35.41	121878	40.32	121526	67.82
43/64	6	120701	33.78	121185	36.81	121889	42.07	121537	69.20
11/16	6	120712	33.78	121196	36.81	121900	42.07	121548	69.20
45/64	6	120723	33.94	121207	37.29	121911	43.80	121559	72.99
23/32	6	120734	33.94	121218	37.29	121922	43.80	121570	72.99
47/64	6	120745	37.01	121229	40.64	121933	45.71	121581	76.15
3/4	6	120756	37.13	121240	40.64	121944	45.71	121592	76.15
49/64	6	120767	39.36	121251	43.36	121955	48.26	121603	79.64
25/32	6	120778	39.36	121262	43.36	121966	48.26	121614	79.64
51/64	6	120789	41.37	121273	47.52	121977	51.33	121625	81.77
13/16	6	120800	41.37	121284	47.52	121988	51.33	121636	81.77
53/64	6	120811	42.98	121295	49.50	121999	53.57	121647	88.35
27/32	6	120822	42.98	121306	49.50	122010	53.57	121658	88.35
55/64	6	120833	44.42	121317	52.80	122021	55.03	121669	88.35
7/8	6	120844	44.42	121328	52.80	122032	55.03	121680	88.35
57/64	6	120855	46.23	121339	54.78	122043	57.43	121691	91.74
29/32	6	120866	46.23	121350	54.78	122054	57.43	121702	91.74
59/64	6	120877	50.33	121361	56.10	122065	61.72	121713	95.70
15/16	6	120888	50.33	121372	56.10	122076	61.72	121724	95.70
61/64	6	120899	52.74	121383	58.74	122087	66.48	121735	100.98
31/32	6	120910	52.74	121394	58.74	122098	66.48	121746	100.98
63/64	6	120921	58.80	121405	64.35	122109	69.81	121757	104.94
1	6	120932	58.80	121416	64.35	122120	69.81	121768	104.94
1-1/32	6	120943	78.91	-	-	-	-	-	-
1-1/16	6	120954	78.91	-	-	-	-	-	-
1-3/32	6	120965	84.14	-	-	-	-	-	-
1-1/8	6	120976	89.89	-	-	-	-	-	-
1-5/32	6	120987	89.89	-	-	-	-	-	-
1-3/16	6	120998	99.51	-	-	-	-	-	-
1-7/32	6	121009	110.13	-	-	-	-	-	-
1-1/4	6	121020	110.13	-	-	-	-	-	-
1-5/16	6	121031	116.48	-	-	-	-	-	-
1-3/8	6	121042	134.17	-	-	-	-	-	-
1-7/16	6	121053	147.54	-	-	-	-	-	-
1-1/2	6	121064	162.12	-	-	-	-	-	-

SILVER & DEMING DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS

High Speed Steel Drills



EXTRA LENGTH - STRAIGHT SHANK - 118° POINT



**8" O.A.L. 5-1/2" FLUTE
BRIGHT FINISH**

**12" O.A.L. 9" FLUTE
BRIGHT FINISH**

SIZE	8" O.A.L. 5-1/2" FL	LIST PRICE	12" O.A.L. 9" FL	LIST PRICE
1/8	117324	20.03	117863	30.79
9/64	117335	28.41	117874	44.64
5/32	117346	21.18	117885	40.59
11/64	117357	22.73	117896	34.62
3/16	117368	22.73	117907	34.62
13/64	117379	23.96	117918	41.95
7/32	117390	24.48	117929	37.55
15/64	117401	25.31	117940	37.55
1/4	117412	25.37	117951	38.84
17/64	117423	25.37	117962	40.19
9/32	117434	25.70	117973	40.19
19/64	117445	31.12	117984	41.67
5/16	117456	27.20	117995	41.67
21/64	117467	31.12	118006	59.54
11/32	117478	28.54	118017	44.64
23/64	117489	32.48	118028	44.64
3/8	117500	29.77	118039	41.13
25/64	117511	32.61	118050	62.23
13/32	117522	32.61	118061	62.23
27/64	-	-	118072	62.23
7/16	117533	34.84	118083	53.16
29/64	-	-	118094	64.94
15/32	117544	39.24	118105	58.46
31/64	-	-	118116	59.81
1/2	117555	39.92	118127	59.81
33/64	-	-	118138	75.76
17/32	-	-	118149	75.76
35/64	-	-	118160	75.76
9/16	-	-	118171	75.76
19/32	-	-	118193	94.70
5/8	-	-	118215	92.01
21/32	-	-	118237	92.01
11/16	-	-	118259	97.42
23/32	-	-	118281	105.53
3/4	-	-	118303	109.72

HSS EXTRA LENGTH DRILLS

CARBIDE
ENDMILLS

CARBIDE
MICRO
ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS



A/C Extension Drills

6" OVERALL LENGTH - 135° SPLIT POINT



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



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

FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
3/32	6	1-1/4	12	116433	4.81	116741	7.46
7/64	6	1-1/2	12	116444	5.20	116752	8.42
1/8	6	1-5/8	12	116455	5.11	116763	8.04
9/64	6	1-3/4	12	116466	6.11	116774	9.54
5/32	6	2	12	116477	6.11	116785	9.46
11/64	6	2-1/8	12	116488	6.67	116796	10.48
3/16	6	2-5/16	12	116499	6.67	116807	10.25
13/64	6	2-7/16	12	116510	8.14	116818	12.97
7/32	6	2-1/2	12	116521	8.14	116829	12.84
15/64	6	2-5/8	12	116532	9.05	116840	14.09
1/4	6	2-3/4	12	116543	8.89	116851	13.83
17/64	6	2-7/8	6	116554	20.33	-	-
9/32	6	2-15/16	6	116565	21.11	-	-
19/64	6	3-1/16	6	116576	24.80	-	-
5/16	6	3-3/16	6	116587	26.91	-	-
21/64	6	3-5/16	6	116598	29.24	-	-
11/32	6	3-7/16	6	116609	28.92	-	-
23/64	6	3-1/2	6	116620	32.46	-	-
3/8	6	3-5/8	6	116631	33.08	-	-

WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	6	2-5/8	12	116642	9.57	116862	14.81
2	6	2-5/8	12	116653	9.57	116873	14.81
10	6	2-7/16	12	116664	7.76	116884	11.67
11	6	2-5/16	12	116675	7.15	116895	11.21
20	6	2-1/8	12	116686	6.42	116906	9.76
21	6	2-1/8	12	116697	6.42	116917	9.76
29	6	1-3/4	12	116708	6.50	116928	10.04
30	6	1-5/8	12	116719	5.21	116939	7.92
40	6	1-5/8	12	116730	4.73	116950	7.34

HSS & COBALT A/C EXTENSION DRILLS

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
ENDMILLS

HSS & COBALT
REAMERS

A/C Extension Drills



12" OVERALL LENGTH - 135° SPLIT POINT



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



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

FRACTIONAL SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1/8	12	1-5/8	12	116961	14.82	118314	23.14
9/64	12	1-3/4	12	116972	14.98	118325	25.98
5/32	12	2	12	116983	14.98	118336	23.68
11/64	12	2-1/8	12	116994	16.86	118347	25.75
3/16	12	2-5/16	12	117005	16.69	118358	25.05
13/64	12	2-7/16	12	117016	19.15	118369	32.79
7/32	12	2-1/2	12	117027	18.97	118380	29.54
15/64	12	2-5/8	12	117038	21.36	118391	31.65
1/4	12	2-3/4	12	117049	20.39	118402	30.21
17/64	12	2-7/8	6	117060	25.38	-	-
9/32	12	2-15/16	6	117071	25.91	-	-
19/64	12	3-1/16	6	117082	29.90	-	-
5/16	12	3-3/16	6	117093	32.72	-	-
21/64	12	3-5/16	6	117104	35.55	-	-
11/32	12	3-7/16	6	117115	35.16	-	-
23/64	12	3-1/2	6	117126	39.83	-	-
3/8	12	3-5/8	6	117137	40.19	-	-
25/64	12	3-3/4	6	117148	44.83	-	-
13/32	12	3-7/8	6	117159	43.23	-	-
27/64	12	3-15/16	6	117170	47.66	-	-
7/16	12	4-1/16	6	117181	47.75	-	-
29/64	12	4-3/16	6	117192	53.86	-	-
15/32	12	4-5/16	6	117203	55.81	-	-
31/64	12	4-3/8	6	117214	57.87	-	-
1/2	12	4-1/2	6	117225	57.26	-	-

WIRE SIZES

SIZE	OVERALL LENGTH	FLUTE LENGTH	PACKAGE QUANTITY	HSS	LIST PRICE	COBALT	LIST PRICE
1	12	2-5/8	12	117236	23.27	118413	32.76
10	12	2-7/16	12	117247	18.71	118424	26.21
11	12	2-5/16	12	117258	18.88	118435	26.21
20	12	2-1/8	12	117269	16.98	118446	24.03
21	12	2-1/8	12	117280	16.66	118457	24.03
29	12	1-3/4	12	117291	17.65	118468	25.21
30	12	1-5/8	12	117302	16.66	118479	24.03
40	12	1-3/8	12	117313	16.66	118490	24.03

HSS & COBALT A/C EXTENSION DRILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT ENDMILLS

HSS & COBALT REAMERS



Drills • Drifts • Extractors

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



OXIDE FINISH

SIZE	SHANK DIAMETER	PKG. QTY.	ITEM#	LIST PRICE
9/32	1/4	6	116323	5.47
5/16	1/4	6	116334	6.55
11/32	1/4	6	116345	6.55
3/8	1/4	6	116356	8.66
13/32	1/4	6	116367	10.00
7/16	1/4	6	116378	11.53
15/32	1/4	6	116389	12.79
1/2	1/4	6	116400	14.21

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	8.96
13/32	3/8	6	116246	10.11
27/64	3/8	6	116257	10.49
7/16	3/8	6	116268	11.18
29/64	3/8	6	116279	12.04
15/32	3/8	6	116290	12.88
31/64	3/8	6	116301	13.42
1/2	3/8	6	116312	13.84

DOUBLE END - 135° POINT HIGH SPEED STEEL



OXIDE FINISH

SIZE	PKG. QTY.	ITEM#	LIST PRICE
1/8	12	116411	2.99
#30	12	116422	2.99

DRILL DRIFTS



OXIDE FINISH

SIZE	FOR USE WITH TAPER#	ITEM#	LIST PRICE
1	1	115157	18.26
2	2	115168	21.65
3	3	115179	24.80
4	4,5,6	115190	27.33

SCREW EXTRACTORS HIGH SPEED STEEL



SIZE	FOR SCREW & BOLT SIZES	PIPE SIZE	PKG. QTY.	ITEM#	LIST PRICE
1	3/16 - 1/4	-	1	115014	5.13
2	1/4 - 5/16	-	1	115025	5.45
3	5/16 - 7/16	-	1	115036	6.63
4	7/16 - 9/16	1/8	1	115047	7.02
5	9/16 - 3/4	1/4	1	115058	8.77
6	3/4 - 1	3/8	1	115069	19.27
7	1 - 1-3/8	1/2	1	115080	31.01
8	1-3/8 - 1-3/4	3/4	1	115091	42.21
9	1-3/4 - 2-1/8	1	1	115102	73.38
10	2-1/8 - 2-1/2	1-1/4	1	115113	190.43
11	2-1/2 - 3	1-1/2	1	115124	202.72
12	3 - 3-1/2	2	1	115135	268.91
SET	SIZES 1-5	-	1	115146	32.99

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

DRILLS • DRIFTS • EXTRACTORS



Technical Information

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

DIAMETER AT POINT

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

SHANK DIAMETER

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

BACK TAPER

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

FLUTE LENGTH

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

OVERALL LENGTH

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

INCLUDED POINT ANGLE

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

LIP HEIGHT

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

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

SUGGESTED METHOD OF MEASUREMENT:

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

CENTRALITY OF WEB

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

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

SUGGESTED METHOD OF MEASUREMENT:

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

FLUTE SPACING

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

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

SUGGESTED METHOD OF MEASUREMENT:

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

High Speed Steel Endmills



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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	2	166758	36.26	166989	45.32
5/32	3/8	7/16	3-1/8	2	166769	38.50	167000	48.11
3/16	3/8	7/16	3-1/8	2	166780	36.29	167011	45.35
7/32	3/8	1/2	3-1/8	2	166791	38.51	167022	48.12
1/4	3/8	1/2	3-1/8	2	166802	36.29	167033	45.35
9/32	3/8	9/16	3-1/8	2	166813	38.51	167044	48.12
5/16	3/8	9/16	3-1/8	2	166824	36.29	167055	45.35
11/32	3/8	9/16	3-1/8	2	166835	38.51	167066	48.12
3/8	3/8	9/16	3-1/8	2	166846	36.29	167077	45.35
13/32	1/2	13/16	3-3/4	2	166857	58.67	167088	73.33
7/16	1/2	13/16	3-3/4	2	166868	55.18	167099	68.97
15/32	1/2	13/16	3-3/4	2	166879	58.67	167110	73.33
1/2	1/2	13/16	3-3/4	2	166890	55.18	167121	68.97
9/16	5/8	1-1/8	4-1/2	2	166901	75.08	167132	93.85
5/8	5/8	1-1/8	4-1/2	2	166912	75.08	167143	93.85
11/16	3/4	1-5/16	5	2	166923	94.55	167154	118.19
3/4	3/4	1-5/16	5	2	166934	94.55	167165	118.19
13/16	7/8	1-9/16	5-1/2	2	166945	118.94	167176	148.68
7/8	7/8	1-9/16	5-1/2	2	166956	118.94	167187	148.68
15/16	1	1-5/8	5-7/8	2	166967	153.26	167198	191.57
1	1	1-5/8	5-7/8	2	166978	146.32	167209	182.89

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	4	168672	36.63	168903	45.80
5/32	3/8	7/16	3-1/8	4	168683	38.68	168914	48.33
3/16	3/8	1/2	3-1/8	4	168694	36.63	168925	45.80
7/32	3/8	9/16	3-1/4	4	168705	38.68	168936	48.33
1/4	3/8	5/8	3-3/8	4	168716	36.63	168947	45.80
9/32	3/8	11/16	3-3/8	4	168727	38.68	168958	48.33
5/16	3/8	3/4	3-1/2	4	168738	36.63	168969	45.80
11/32	3/8	3/4	3-1/2	4	168749	38.68	168980	48.33
3/8	3/8	3/4	3-1/2	4	168760	36.63	168991	45.80
13/32	1/2	1	4-1/8	4	168771	56.85	169002	71.06
7/16	1/2	1	4-1/8	4	168782	55.29	169013	69.12
15/32	1/2	1	4-1/8	4	168793	56.85	169024	71.06
1/2	1/2	1	4-1/8	4	168804	55.29	169035	69.12
9/16	5/8	1-3/8	5	4	168815	73.80	169046	92.25
5/8	5/8	1-3/8	5	4	168826	73.80	169057	92.25
11/16	3/4	1-5/8	5-5/8	4	168837	92.96	169068	116.21
3/4	3/4	1-5/8	5-5/8	4	168848	92.96	169079	116.21
13/16	7/8	1-7/8	6-1/8	4	168859	124.11	169090	155.15
7/8	7/8	1-7/8	6-1/8	4	168870	124.11	169101	155.15
15/16	1	1-7/8	6-3/8	4	168881	150.29	169112	187.86
1	1	1-7/8	6-3/8	4	168892	144.11	169123	180.03

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

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

M42 Cobalt Endmills



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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	2	231218	44.13	231449	55.16
5/32	3/8	7/16	3-1/8	2	231229	46.85	231460	58.57
3/16	3/8	7/16	3-1/8	2	231240	44.17	231471	55.20
7/32	3/8	1/2	3-1/8	2	231251	46.87	231482	58.58
1/4	3/8	1/2	3-1/8	2	231262	44.17	231493	55.20
9/32	3/8	9/16	3-1/8	2	231273	46.87	231504	58.58
5/16	3/8	9/16	3-1/8	2	231284	44.17	231515	55.20
11/32	3/8	9/16	3-1/8	2	231295	46.87	231526	58.58
3/8	3/8	9/16	3-1/8	2	231306	44.17	231537	55.20
13/32	1/2	13/16	3-3/4	2	231317	71.41	231548	38.31
7/16	1/2	13/16	3-3/4	2	231328	67.16	231559	83.95
15/32	1/2	13/16	3-3/4	2	231339	71.41	231570	89.27
1/2	1/2	13/16	3-3/4	2	231350	67.16	231581	83.95
9/16	5/8	1-1/8	4-1/2	2	231361	91.39	231592	114.24
5/8	5/8	1-1/8	4-1/2	2	231372	91.39	231603	114.24
11/16	3/4	1-5/16	5	2	231383	115.09	231614	143.87
3/4	3/4	1-5/16	5	2	231394	115.09	231625	143.87
13/16	7/8	1-9/16	5-1/2	2	231405	144.79	231636	180.99
7/8	7/8	1-9/16	5-1/2	2	231416	144.79	231647	180.99
15/16	1	1-5/8	5-7/8	2	231427	186.56	231658	233.20
1	1	1-5/8	5-7/8	2	231438	178.10	231669	222.63

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



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED	LIST PRICE	ALTiN	LIST PRICE
1/8	3/8	3/8	3-1/16	4	231680	44.59	231911	55.74
5/32	3/8	7/16	3-1/8	4	231691	47.08	231922	58.83
3/16	3/8	1/2	3-1/8	4	231702	44.59	231933	55.74
7/32	3/8	9/16	3-1/4	4	231713	47.08	231944	58.83
1/4	3/8	5/8	3-3/8	4	231724	44.59	231955	55.74
9/32	3/8	11/16	3-3/8	4	231735	47.08	231966	58.83
5/16	3/8	3/4	3-1/2	4	231746	44.59	231977	55.74
11/32	3/8	3/4	3-1/2	4	231757	47.08	231988	58.83
3/8	3/8	3/4	3-1/2	4	231768	44.59	231999	55.74
13/32	1/2	1	4-1/8	4	231779	69.20	232010	86.50
7/16	1/2	1	4-1/8	4	231790	67.31	232021	84.14
15/32	1/2	1	4-1/8	4	231801	69.20	232032	86.50
1/2	1/2	1	4-1/8	4	231812	67.31	232043	84.14
9/16	5/8	1-3/8	5	4	231823	89.84	232054	112.30
5/8	5/8	1-3/8	5	4	231834	89.84	232065	112.30
11/16	3/4	1-5/8	5-5/8	4	231845	113.15	232076	141.44
3/4	3/4	1-5/8	5-5/8	4	231856	113.15	232087	141.44
13/16	7/8	1-7/8	6-1/8	4	231867	151.08	232098	188.86
7/8	7/8	1-7/8	6-1/8	4	231878	151.08	232109	188.86
15/16	1	1-7/8	6-3/8	4	231889	182.93	232120	228.68
1	1	1-7/8	6-3/8	4	231900	175.41	232131	219.14

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

COBALT ENDMILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT REAMERS



M42 Cobalt Roughing Endmills

COARSE PITCH - 30° HELIX - NON CENTER CUTTING



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED LIST PRICE	ALTiN LIST PRICE
1/4	3/8	5/8	2-7/16	3	167220 54.33	167385 67.90
5/16	3/8	3/4	2-1/2	3	167231 59.30	167396 74.15
3/8	3/8	3/4	2-1/2	4	167242 61.97	167407 77.45
7/16	3/8	1	2-11/16	4	167253 62.66	167418 77.93
1/2	1/2	1	3	4	167264 63.44	167429 79.32
1/2	1/2	1-1/4	3-1/4	4	167275 65.64	167440 82.05
5/8	5/8	1-5/8	3-3/4	4	167286 83.51	167451 104.39
3/4	3/4	1-5/8	3-7/8	4	167297 91.91	167462 114.89
7/8	3/4	1-7/8	4-1/8	5	167308 117.68	167473 159.22
1	1	2	4-1/2	5	167319 123.13	167484 153.91
1-1/8	1	2	4-1/2	6	167330 191.29	167495 239.02
1-1/4	1-1/4	2	4-1/2	6	167341 207.56	167506 259.40
1-1/2	1-1/4	2	4-1/2	6	167352 243.37	167517 304.21
1-3/4	1-1/4	2-1/2	5	6	167363 367.10	167528 458.87
2	1-1/4	2	4-1/2	8	167374 338.17	167539 422.73

FINE PITCH - 30° HELIX - NON CENTER CUTTING



UNCOATED



ALTiN COATED

SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	NUMBER OF FLUTES	UNCOATED LIST PRICE	ALTiN LIST PRICE
1/4	3/8	5/8	2-7/16	3	168364 54.33	168518 67.90
5/16	3/8	3/4	2-1/2	3	168375 59.32	168529 74.15
3/8	3/8	3/4	2-1/2	4	168386 62.34	168540 77.93
7/16	3/8	1	2-11/16	4	168397 62.66	168551 78.31
1/2	1/2	1-1/4	3-1/4	4	168408 65.64	168562 79.32
5/8	5/8	1-5/8	3-3/4	4	168419 83.51	168573 104.39
3/4	3/4	1-5/8	3-7/8	4	168430 91.91	168584 114.89
7/8	3/4	1-7/8	4-1/8	5	168441 120.26	168595 150.32
1	1	2	4-1/2	5	168452 123.20	168606 154.01
1-1/8	1	2	4-1/2	6	168463 204.27	168617 255.35
1-1/4	1-1/4	2	4-1/2	6	168474 207.56	168628 259.40
1-1/2	1-1/4	2	4-1/2	6	168485 256.41	168639 320.51
1-3/4	1-1/4	2-1/2	5	6	168496 367.10	168650 458.87
2	1-1/4	2	4-1/2	8	168507 361.10	168661 451.82

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

COBALT ROUGHING ENDMILLS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT REAMERS

Chucking Reamers



STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#80	.0135	3/8	2	3/4	.0135	182708	25.40	185920	28.12
#79	.0145	3/8	2	3/4	.0145	182719	25.40	185931	28.12
1/64	.0156	3/8	2	3/4	.0156	182730	25.40	185942	28.12
#78	.0160	3/8	2	7/8	.0160	182741	25.40	185953	28.12
#77	.0180	3/8	2	7/8	.0180	182752	25.40	185964	28.12
#76	.0200	3/8	2	7/8	.0200	182763	25.40	185975	28.12
#75	.0210	1/2	3	1	.0210	182774	25.40	185986	28.12
#74	.0225	1/2	3	1	.0225	182785	25.40	185997	28.12
#73	.0240	1/2	3	1-1/8	.0240	182796	25.40	186008	28.12
#72	.0250	1/2	3	1-1/8	.0250	182807	25.40	186019	28.12
#71	.0260	1/2	3	1-1/4	.0260	182818	25.40	186030	28.12
#70	.0280	1/2	3	1-1/4	.0280	182829	25.40	186041	28.12
#69	.0292	1/2	3	1-3/8	.0292	182840	25.40	186052	28.12
#68	.0310	1/2	3	1-3/8	.0310	182851	25.40	186063	28.12
1/32	.0312	1/2	3	1-3/8	.0312	182862	20.05	186074	23.16
#67	.0320	1/2	3	1-3/8	.0320	182873	21.27	186085	23.16
#66	.0330	1/2	3	1-3/8	.0330	182884	21.27	186096	23.16
#65	.0350	1/2	3	1-1/2	.0350	182895	21.27	186107	23.16
#64	.0360	1/2	3	1-1/2	.0360	182906	21.27	186118	23.16
#63	.0370	1/2	3	1-1/2	.0370	182917	21.27	186129	23.16
#62	.0380	1/2	3	1-1/2	.0380	182928	21.27	186140	23.16
#61	.0390	1/2	3	1-1/2	.0390	182939	21.27	186151	23.16
1.0mm	.0394	1/2	4	2-1/2	.0394	182950	21.27	186162	22.79
#60	.0400	1/2	4	2-1/2	.0390	182961	21.27	186173	22.79
#59	.0410	1/2	4	2-1/2	.0390	182972	21.27	186184	22.79
#58	.0420	1/2	4	2-1/2	.0390	182983	21.27	186195	22.79
#57	.0430	1/2	4	2-1/2	.0390	182994	21.27	186206	22.79
#56	.0465	1/2	4	2-1/2	.0455	183005	21.27	186217	22.79
3/64	.0469	1/2	4	2-1/2	.0455	183016	21.27	186228	22.79
#55	.0520	1/2	4	2-1/2	.0510	183027	21.27	186239	22.79
#54	.0550	1/2	4	2-1/2	.0510	183038	21.27	186250	22.79
1.5mm	.0591	1/2	4	2-1/2	.0510	183049	21.27	186261	22.79
#53	.0595	1/2	4	2-1/2	.0585	183060	21.27	186272	22.79
1/16	.0625	1/2	4	2-1/2	.0585	183071	19.13	186283	22.79
#52	.0635	1/2	4	2-1/2	.0585	183082	19.13	186294	22.79
#51	.0670	3/4	4	3	.0660	183093	17.11	186305	18.33
#50	.0700	3/4	4	3	.0660	183104	17.11	186316	18.33
#49	.0730	3/4	4	3	.0660	183115	17.11	186327	18.33
#48	.0760	3/4	4	3	.0720	183126	17.11	186338	18.33
5/64	.0781	3/4	4	3	.0720	183137	17.11	186349	18.33
#47	.0785	3/4	4	3	.0720	183148	17.11	186360	18.33
2.0mm	.0787	3/4	4	3	.0720	183159	17.11	186371	18.33
#46	.0810	3/4	4	3	.0771	183170	17.11	186382	18.33
#45	.0820	3/4	4	3	.0771	183181	17.11	186393	18.33
#44	.0860	3/4	4	3	.0810	183192	17.11	186404	18.33
#43	.0890	3/4	4	3	.0810	183203	17.11	186415	18.33
#42	.0935	3/4	4	3	.0880	183214	17.11	186426	18.33
3/32	.0938	3/4	4	3	.0880	183225	15.41	186437	18.33
#41	.0960	7/8	4	3-1/2	.0928	183236	17.29	186448	18.48
#40	.0980	7/8	4	3-1/2	.0928	183247	17.29	186459	18.48
2.5mm	.0984	7/8	4	3-1/2	.0928	183258	17.29	186470	18.48
#39	.0995	7/8	4	3-1/2	.0928	183269	17.29	186481	18.48
#38	.1015	7/8	4	3-1/2	.0950	183280	17.29	186492	18.48
#37	.1040	7/8	4	3-1/2	.0950	183291	17.29	186503	18.48
#36	.1065	7/8	4	3-1/2	.1030	183302	17.29	186514	18.48

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



Chucking Reamers

STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
7/64	.1094	7/8	4	3-1/2	.1030	183313	17.82	186525	19.04
#35	.1100	7/8	4	3-1/2	.1030	183324	17.82	186536	19.04
#34	.1110	7/8	4	3-1/2	.1055	183335	17.82	186547	19.04
#33	.1130	7/8	4	3-1/2	.1055	183346	17.82	186558	19.04
#32	.1160	7/8	4	3-1/2	.1120	183357	17.82	186569	19.04
3.0mm	.1181	7/8	4	3-1/2	.1120	183368	17.82	186580	19.04
#31	.1200	7/8	4	3-1/2	.1120	183379	17.82	186591	19.04
o/u	.1240	7/8	4	3-1/2	.1190	183390	17.82	186602	19.04
1/8	.1250	7/8	4	3-1/2	.1190	183401	14.21	186613	15.22
o/u	.1260	7/8	4	3-1/2	.1190	183412	17.82	186624	19.04
#30	.1285	7/8	4	3-1/2	.1190	183423	17.82	186635	19.04
#29	.1360	1	4	4	.1275	183434	21.27	186646	22.78
3.5mm	.1378	1	4	4	.1350	183445	21.27	186657	22.78
#28	.1405	1	4	4	.1350	183456	21.27	186668	22.78
9/64	.1406	1	4	4	.1350	183467	21.27	186679	22.78
#27	.1440	1	4	4	.1350	183478	21.27	186690	22.78
#26	.1470	1	4	4	.1430	183489	21.27	186701	22.78
#25	.1495	1	4	4	.1430	183500	21.27	186712	22.78
#24	.1520	1	4	4	.1460	183511	21.27	186723	22.78
#23	.1540	1	4	4	.1460	183522	21.27	186734	22.78
5/32	.1562	1	4	4	.1510	183533	21.27	186745	22.78
#22	.1570	1	6	4	.1510	183544	21.27	186756	22.78
4.0mm	.1575	1	6	4	.1510	183555	21.27	186767	22.78
#21	.1590	1-1/8	6	4-1/2	.1530	183566	22.73	186778	24.32
#20	.1610	1-1/8	6	4-1/2	.1530	183577	22.73	186789	24.32
#19	.1660	1-1/8	6	4-1/2	.1595	183588	22.73	186800	24.32
#18	.1695	1-1/8	6	4-1/2	.1595	183599	22.73	186811	24.32
11/64	.1719	1-1/8	6	4-1/2	.1645	183610	22.73	186822	24.32
#17	.1730	1-1/8	6	4-1/2	.1645	183621	22.73	186833	24.32
#16	.1770	1-1/8	6	4-1/2	.1704	183632	22.73	186844	24.32
4.5mm	.1772	1-1/8	6	4-1/2	.1704	183643	22.73	186855	24.32
#15	.1800	1-1/8	6	4-1/2	.1755	183654	22.73	186866	24.32
#14	.1820	1-1/8	6	4-1/2	.1755	183665	22.73	186877	24.32
#13	.1850	1-1/8	6	4-1/2	.1805	183676	22.73	186888	24.32
o/u	.1865	1-1/8	6	4-1/2	.1805	183687	22.73	186899	24.32
3/16	.1875	1-1/8	6	4-1/2	.1805	183698	20.42	186910	23.50
o/u	.1885	1-1/8	6	4-1/2	.1805	183709	22.73	186921	24.32
#12	.1890	1-1/8	6	4-1/2	.1805	183720	22.73	186932	24.32
#11	.1910	1-1/4	6	5	.1860	183731	25.45	186943	29.38
#10	.1935	1-1/4	6	5	.1860	183742	25.45	186954	29.38
#9	.1960	1-1/4	6	5	.1895	183753	25.45	186965	29.38
5.0mm	.1969	1-1/4	6	5	.1895	183764	25.45	186976	29.38
#8	.1990	1-1/4	6	5	.1895	183775	25.45	186987	29.38
#7	.2010	1-1/4	6	5	.1895	183786	25.45	186998	29.38
13/64	.2031	1-1/4	6	5	.1945	183797	25.45	187009	29.38
#6	.2040	1-1/4	6	5	.1945	183808	25.45	187020	29.38
#5	.2055	1-1/4	6	5	.2016	183819	25.45	187031	29.38
#4	.2090	1-1/4	6	5	.2016	183830	25.45	187042	29.38
#3	.2130	1-1/4	6	5	.2075	183841	25.45	187053	29.38
5.5mm	.2165	1-1/4	6	5	.2075	183852	25.45	187064	29.38
7/32	.2188	1-1/4	6	5	.2075	183863	25.45	187075	29.38
#2	.2210	1-1/2	6	6	.2173	183874	26.15	187086	30.21
#1	.2280	1-1/2	6	6	.2173	183885	26.15	187097	30.21
A	.2340	1-1/2	6	6	.2265	183896	26.15	187108	30.21
15/64	.2344	1-1/2	6	6	.2265	183907	26.15	187119	30.21

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

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

Chucking Reamers



STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
6.0mm	.2362	1-1/2	6	6	.2265	183918	27.56	187130	30.37
B	.2380	1-1/2	6	6	.2329	183929	27.56	187141	30.37
C	.2420	1-1/2	6	6	.2329	183940	27.56	187152	30.37
D	.2460	1-1/2	6	6	.2329	183951	27.56	187163	27.58
o/u	.2490	1-1/2	6	6	.2405	183962	24.81	187174	27.32
1/4	.2500	1-1/2	6	6	.2405	183973	23.40	187185	25.82
o/u	.2510	1-1/2	6	6	.2405	183984	24.81	187196	27.33
6.5mm	.2559	1-1/2	6	6	.2405	183995	27.56	187207	30.37
F	.2570	1-1/2	6	6	.2485	184006	27.56	187218	30.37
G	.2610	1-1/2	6	6	.2485	184017	27.56	187229	30.37
17/64	.2656	1-1/2	6	6	.2485	184028	30.71	187240	41.18
H	.2660	1-1/2	6	6	.2485	184039	30.71	187251	41.18
I	.2720	1-1/2	6	6	.2485	184050	30.71	187262	41.18
7.0mm	.2756	1-1/2	6	6	.2485	184061	30.71	187273	41.18
J	.2770	1-1/2	6	6	.2485	184072	30.71	187284	41.18
K	.2810	1-1/2	6	6	.2485	184083	30.71	187295	41.18
9/32	.2812	1-1/2	6	6	.2485	184094	29.16	187306	39.11
L	.2900	1-1/2	6	6	.2792	184105	30.71	187317	41.18
M	.2950	1-1/2	6	6	.2792	184116	30.71	187328	41.18
7.5mm	.2953	1-1/2	6	6	.2792	184127	30.71	187339	41.18
19/64	.2969	1-1/2	6	6	.2792	184138	30.71	187350	41.18
N	.3020	1-1/2	6	6	.2792	184149	30.71	187361	41.18
o/u	.3115	1-1/2	6	6	.2792	184160	29.16	187372	39.11
5/16	.3125	1-1/2	6	6	.2792	184171	27.67	187383	37.06
o/u	.3135	1-1/2	6	6	.2792	184182	29.16	187394	39.11
8.0mm	.3150	1-1/2	6	6	.2792	184193	30.71	187405	41.18
O	.3160	1-1/2	6	6	.2792	184204	30.71	187416	41.18
P	.3230	1-1/2	6	6	.2792	184215	32.84	187427	44.38
21/64	.3281	1-1/2	6	6	.2792	184226	32.84	187438	44.38
Q	.3320	1-1/2	6	6	.2792	184237	32.84	187449	44.38
8.5mm	.3346	1-1/2	6	6	.2792	184248	32.84	187460	44.38
R	.3390	1-1/2	6	6	.2792	184259	32.84	187471	44.38
11/32	.3438	1-1/2	6	6	.2792	184270	32.84	187482	44.38
S	.3480	1-3/4	6	6	.3105	184281	33.16	187493	45.12
9.0mm	.3543	1-3/4	6	7	.3105	184292	33.16	187504	45.12
T	.3580	1-3/4	6	7	.3105	184303	33.16	187515	45.12
23/64	.3594	1-3/4	6	7	.3105	184314	33.16	187526	45.12
U	.3680	1-3/4	6	7	.3105	184325	33.16	187537	45.12
9.5mm-o/u	.3740	1-3/4	6	7	.3105	184336	31.49	187548	42.81
3/8	.3750	1-3/4	6	7	.3105	184347	29.80	187559	40.58
o/u	.3760	1-3/4	6	7	.3105	184358	31.49	187570	42.81
V	.3770	1-3/4	6	7	.3105	184369	36.06	187581	54.99
W	.3860	1-3/4	6	7	.3105	184380	36.06	187592	54.99
25/64	.3906	1-3/4	6	7	.3105	184391	36.06	187603	54.99
10.0mm	.3937	1-3/4	6	7	.3105	184402	36.06	187614	54.99
X	.3970	1-3/4	6	7	.3105	184413	36.06	187625	54.99
Y	.4040	1-3/4	6	7	.3105	184424	37.41	187636	54.99
13/32	.4062	1-3/4	6	7	.3105	184435	37.41	187647	54.99
Z	.4130	1-3/4	6	7	.3730	184446	37.41	187658	54.99
10.5mm	.4134	1-3/4	6	7	.3730	184457	37.77	187669	54.99
27/64	.4219	1-3/4	6	7	.3730	184468	37.41	187680	54.99
11.0mm	.4331	1-3/4	6	7	.3730	184479	37.41	187691	54.99
o/u	.4365	1-3/4	6	7	.3730	184490	35.54	187702	54.99
7/16	.4375	1-3/4	6	7	.3730	184501	35.54	187713	54.99
o/u	.4385	1-3/4	6	7	.3730	184512	35.54	187724	54.99

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

HSS & COBALT REAMERS

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



Chucking Reamers

STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
11.5mm	.4528	1-3/4	6	7	.3730	184523	40.76	187735	63.03
29/64	.4531	1-3/4	6	7	.3730	184534	40.76	187746	63.03
15/32	.4688	1-3/4	6	7	.3730	184545	40.76	187757	63.03
12.0mm	.4724	2	6	8	.4355	184556	40.76	187768	63.03
31/64	.4844	2	6	8	.4355	184567	40.76	187779	63.03
12.5mm	.4921	2	6	8	.4355	184578	40.76	187790	63.03
o/u	.4990	2	6	8	.4355	184589	38.68	187801	63.03
1/2	.5000	2	6	8	.4355	184600	38.68	187812	63.03
o/u	.5010	2	6	8	.4355	184611	38.68	187823	63.03
13.0mm	.5118	2	6	8	.4355	184622	50.50	-	-
33/64	.5156	2	6	8	.4355	184633	50.50	-	-
17/32	.5312	2	6	8	.4355	184644	48.09	187834	70.70
13.5mm	.5315	2	6	8	.4355	184655	50.50	-	-
35/64	.5469	2	8	8	.4355	184666	50.50	-	-
14.0mm	.5512	2	8	8	.4355	184677	50.50	-	-
o/u	.5615	2	8	8	.4355	184688	50.50	-	-
9/16	.5625	2	8	8	.4355	184699	48.09	187845	70.70
o/u	.5635	2	8	8	.4355	184710	50.50	-	-
14.5mm	.5709	2	8	8	.4355	184721	50.50	-	-
37/64	.5781	2	8	8	.4355	184732	50.50	-	-
15.0mm	.5906	2	8	8	.4355	184743	50.50	-	-
19/32	.5938	2	8	8	.4355	184754	48.09	187856	70.70
39/64	.6094	2-1/4	8	9	.5615	184765	58.93	-	-
15.5mm	.6102	2-1/4	8	9	.5615	184776	58.93	-	-
o/u	.6240	2-1/4	8	9	.5615	184787	58.93	-	-
5/8	.6250	2-1/4	8	9	.5615	184798	56.33	187867	82.49
o/u	.6260	2-1/4	8	9	.5615	184809	58.93	-	-
16.0mm	.6299	2-1/4	8	9	.5615	184820	58.93	-	-
41/64	.6406	2-1/4	8	9	.5615	184831	58.93	-	-
16.5mm	.6496	2-1/4	8	9	.5615	184842	58.93	-	-
21/32	.6562	2-1/4	8	9	.5615	184853	63.45	187878	93.27
17.0mm	.6693	2-1/4	8	9	.5615	184864	66.59	-	-
43/64	.6719	2-1/4	8	9	.5615	184875	66.59	-	-
o/u	.6865	2-1/4	8	9	.5615	184886	66.59	-	-
11/16	.6875	2-1/4	8	9	.5615	184897	63.45	187889	93.27
o/u	.6885	2-1/4	8	9	.5615	184908	71.48	-	-
17.5mm	.6890	2-1/4	8	9	.5615	184919	71.48	-	-
45/64	.7031	2-1/4	8	9	.5615	184930	71.48	-	-
18.0mm	.7087	2-1/4	8	9	.5615	184941	71.48	-	-
23/32	.7188	2-1/4	8	9	.5615	184952	70.80	187900	104.10
18.5mm	.7283	2-1/2	8	9	.6240	184963	74.33	-	-
47/64	.7344	2-1/2	8	9	.6240	184974	82.33	-	-
19.0mm	.7480	2-1/2	8	9	.6240	184985	82.33	-	-
o/u	.7490	2-1/2	8	9	.6240	184996	82.33	-	-
3/4	.7500	2-1/2	8	9	.6240	185007	71.23	187911	104.69
o/u	.7510	2-1/2	8	9	.6240	185018	79.24	-	-
49/64	.7656	2-1/2	8	9	.6240	185029	79.24	-	-
19.5mm	.7677	2-1/2	8	9	.6240	185040	79.24	-	-
25/32	.7812	2-1/2	8	9	.6240	185051	76.82	187922	112.91
20.0mm	.7874	2-1/2	8	9	.6240	185062	84.84	-	-
51/64	.7969	2-1/2	8	9	.6240	185073	84.84	-	-
20.5mm	.8071	2-1/2	8	9	.6240	185084	84.84	-	-
o/u	.8115	2-1/2	8	9	.6240	185095	84.84	-	-
13/16	.8125	2-1/2	8	9	.6240	185106	76.82	187933	112.91
o/u	.8135	2-1/2	8	9	.6240	185117	84.84	-	-

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

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Chucking Reamers



STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
21.0mm	.8268	2-1/2	8	9-1/2	.6240	185128	84.84	-	-
53/64	.8281	2-1/2	8	9-1/2	.6240	185139	84.84	-	-
27/32	.8438	2-1/2	8	9-1/2	.6240	185150	90.87	187944	133.59
21.5mm	.8465	2-5/8	8	10	.7490	185161	98.91	-	-
55/64	.8594	2-5/8	8	10	.7490	185172	98.91	-	-
22.0mm	.8661	2-5/8	8	10	.7490	185183	98.91	-	-
o/u	.8740	2-5/8	8	10	.7490	185194	98.91	-	-
7/8	.8750	2-5/8	8	10	.7490	185205	92.98	187955	136.68
o/u	.8760	2-5/8	8	10	.7490	185216	101.04	-	-
22.5mm	.8858	2-5/8	8	10	.7490	185227	101.04	-	-
57/64	.8906	2-5/8	8	10	.7490	185238	101.04	-	-
23.0mm	.9055	2-5/8	8	10	.7490	185249	101.04	-	-
29/32	.9062	2-5/8	8	10	.7490	185260	100.21	187966	147.28
59/64	.9219	2-5/8	8	10	.7490	185271	108.21	-	-
23.5mm	.9252	2-5/8	8	10	.7490	185282	108.21	-	-
o/u	.9365	2-5/8	8	10	.7490	185293	108.21	-	-
15/16	.9375	2-5/8	8	10	.7490	185304	100.21	187977	147.28
o/u	.9385	2-5/8	8	10	.7490	185315	108.21	-	-
24.0mm	.9449	2-5/8	8	10	.7490	185326	108.21	-	-
61/64	.9531	2-5/8	8	10	.7490	185337	108.21	-	-
24.5mm	.9646	2-5/8	8	10	.7490	185348	108.20	-	-
31/32	.9688	2-5/8	8	10	.7490	185359	112.25	187988	164.95
25.0mm	.9843	2-3/4	8	10-1/2	.8740	185370	114.87	-	-
63/64	.9844	2-3/4	8	10-1/2	.8740	185381	114.87	-	-
o/u	.9990	2-3/4	8	10-1/2	.8740	185392	114.87	-	-
1	1.0000	2-3/4	8	10-1/2	.8740	185403	113.30	187999	166.50
o/u	1.0010	2-3/4	8	10-1/2	.8740	185414	121.30	-	-
1-1/32	1.0312	2-3/4	8	10-1/2	.8740	185425	157.63	-	-
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	185436	125.57	188010	184.59
1-3/32	1.0938	2-7/8	8	11	.8740	185447	165.53	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	185458	133.47	188021	196.17
1-5/32	1.1562	2-7/8	10	11	.9990	185469	188.34	-	-
1-3/16	1.1875	2-7/8	10	11	.9990	185480	156.32	188032	229.77
1-7/32	1.2188	3	10	11-1/2	.9990	185491	197.71	-	-
1-1/4	1.2500	3	10	11-1/2	.9990	185502	165.64	188043	243.50
1-9/32	1.2812	3	10	11-1/2	.9990	185513	225.30	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	185524	193.22	188054	283.98
1-11/32	1.3438	3-1/4	10	12	.9990	185535	235.10	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	185546	203.05	188065	298.48
1-13/32	1.4062	3-1/4	10	12	1.2490	185557	249.78	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	185568	217.72	188076	320.12
1-15/32	1.4688	3-1/2	10	12-1/2	1.2490	185579	266.54	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	185590	234.46	188087	344.65
1-9/16	1.5625	3-1/2	12	13	1.2490	192124	331.93	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192135	331.93	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192146	381.19	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192157	381.19	-	-
1-13/16	1.8125	4	12	14	1.4990	192168	439.03	-	-
1-7/8	1.8750	4	12	14	1.4990	192179	439.03	-	-
1-15/16	1.9375	4	12	14	1.4990	192190	514.86	-	-
2	2.0000	4	12	14	1.4990	192201	514.86	-	-

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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, -0.000	+0.003, -0.000	+0.001, +0.004	+0.002, +0.006

Chucking Reamers



STOCKED INTERMEDIATE SIZES - HIGH SPEED STEEL

DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE	DEC. SIZE	ITEM#	LIST PRICE			
0.2990	177505	31.67	0.3370	178253	37.30	0.3730	179001	33.90	0.4105	179749	41.87	0.4465	180497	44.53	0.4805	181245	44.53	0.6270	181993	71.07
0.2995	177516	31.67	0.3375	178264	37.30	0.3735	179012	33.90	0.4110	179760	41.87	0.4470	180508	44.53	0.4810	181256	44.53	0.6275	182004	71.07
0.3000	177527	31.67	0.3380	178275	37.30	0.3745	179023	33.90	0.4115	179771	41.87	0.4475	180519	44.53	0.4815	181267	44.53	0.6280	182015	71.07
0.3005	177538	31.67	0.3385	178286	37.30	0.3755	179034	40.83	0.4120	179782	41.87	0.4480	180530	44.53	0.4820	181278	44.53	0.6300	182697	71.07
0.3010	177549	31.67	0.3395	178297	37.30	0.3765	179045	40.83	0.4125	179793	41.87	0.4485	180541	44.53	0.4825	181289	44.53	0.6845	182026	71.07
0.3015	177560	31.67	0.3400	178308	37.30	0.3775	179056	40.83	0.4135	179804	41.87	0.4490	180552	44.53	0.4830	181300	44.53	0.6850	182037	71.07
0.3025	177571	31.67	0.3405	178319	37.30	0.3780	179067	40.83	0.4140	179815	41.87	0.4495	180563	44.53	0.4835	181311	44.53	0.6855	182048	71.07
0.3030	177582	31.67	0.3410	178330	37.30	0.3785	179078	40.83	0.4145	179826	41.87	0.4500	180574	44.53	0.4840	181322	44.53	0.6860	182059	71.07
0.3035	177593	31.67	0.3415	178341	37.30	0.3790	179089	40.83	0.4150	179837	41.87	0.4505	180585	44.53	0.4845	181333	41.85	0.6870	182070	71.07
0.3040	177604	31.67	0.3420	178352	37.30	0.3795	179100	40.83	0.4155	179848	41.87	0.4510	180596	44.53	0.4850	181344	41.85	0.6880	182081	78.34
0.3045	177615	31.67	0.3425	178363	37.30	0.3800	179111	40.83	0.4160	179859	41.87	0.4515	180607	44.53	0.4855	181355	41.85	0.6895	182092	78.34
0.3050	177626	31.67	0.3430	178374	37.30	0.3805	179122	40.83	0.4165	179870	41.87	0.4520	180618	44.53	0.4860	181366	41.85	0.6900	182103	78.34
0.3055	177637	31.67	0.3435	178385	37.30	0.3810	179133	40.83	0.4170	179881	41.87	0.4525	180629	44.53	0.4865	181377	41.85	0.6905	182114	78.34
0.3060	177648	31.67	0.3440	178396	37.84	0.3815	179144	40.83	0.4175	179892	41.87	0.4530	180640	44.53	0.4870	181388	41.85	0.7470	182125	83.25
0.3065	177659	31.67	0.3445	178407	37.84	0.3820	179155	40.83	0.4180	179903	41.87	0.4535	180651	44.53	0.4875	181399	41.85	0.7475	182136	83.25
0.3070	177670	31.67	0.3450	178418	37.84	0.3825	179166	40.83	0.4185	179914	41.87	0.4540	180662	44.53	0.4880	181410	41.85	0.7485	182147	83.25
0.3075	177681	31.67	0.3455	178429	37.84	0.3830	179177	40.83	0.4190	179925	41.87	0.4545	180673	44.53	0.4885	181421	41.85	0.7495	182158	83.25
0.3080	177692	31.67	0.3460	178440	37.84	0.3835	179188	40.83	0.4195	179936	41.87	0.4550	180684	44.53	0.4890	181432	41.85	0.7505	182169	90.33
0.3085	177703	31.67	0.3465	178451	37.84	0.3840	179199	40.83	0.4200	179947	41.87	0.4555	180695	44.53	0.4895	181443	41.85	0.7515	182180	90.33
0.3090	177714	31.67	0.3470	178462	37.84	0.3845	179210	40.83	0.4205	179958	41.87	0.4560	180706	44.53	0.4900	181454	41.85	0.7520	182191	90.33
0.3095	177725	31.67	0.3475	178473	37.84	0.3850	179221	40.83	0.4210	179969	41.87	0.4565	180717	44.53	0.4905	181465	41.85	0.7525	182202	90.33
0.3100	177736	31.67	0.3485	178484	37.84	0.3855	179232	40.83	0.4215	179980	41.87	0.4570	180728	44.53	0.4910	181476	41.85	0.7530	182213	90.33
0.3105	177747	31.67	0.3490	178495	37.84	0.3865	179243	40.83	0.4220	179991	39.25	0.4575	180739	44.53	0.4915	181487	41.85	0.7540	182224	90.33
0.3110	177758	31.67	0.3495	178506	37.84	0.3870	179254	40.83	0.4225	180002	39.25	0.4580	180750	44.53	0.4920	181498	41.85	0.7550	182235	90.33
0.3120	177769	31.67	0.3500	178517	37.84	0.3875	179265	40.83	0.4230	180013	39.25	0.4585	180761	44.53	0.4925	181509	41.85	0.8095	182246	90.33
0.3130	177780	37.30	0.3505	178528	37.84	0.3880	179276	40.83	0.4235	180024	39.25	0.4590	180772	44.53	0.4930	181520	41.85	0.8100	182257	90.33
0.3140	177791	37.30	0.3510	178539	37.84	0.3885	179287	40.83	0.4240	180035	39.25	0.4595	180783	44.53	0.4935	181531	41.85	0.8105	182268	90.33
0.3145	177802	37.30	0.3515	178550	37.84	0.3890	179298	40.83	0.4245	180046	39.25	0.4600	180794	44.53	0.4940	181542	41.85	0.8110	182279	90.33
0.3155	177813	37.30	0.3520	178561	37.84	0.3895	179309	40.83	0.4250	180057	39.25	0.4605	180805	44.53	0.4945	181553	41.85	0.8120	182290	90.33
0.3165	177824	37.30	0.3525	178572	37.84	0.3900	179320	40.83	0.4255	180068	39.25	0.4610	180816	44.53	0.4950	181564	41.85	0.8130	182301	99.49
0.3170	177835	37.30	0.3530	178583	37.84	0.3905	179331	40.83	0.4260	180079	39.25	0.4615	180827	44.53	0.4955	181575	41.85	0.8140	182312	99.49
0.3175	177846	37.30	0.3535	178594	37.84	0.3910	179342	41.87	0.4265	180090	39.25	0.4620	180838	44.53	0.4960	181586	41.85	0.8145	182323	99.49
0.3180	177857	37.30	0.3540	178605	37.84	0.3915	179353	41.87	0.4270	180101	39.25	0.4625	180849	44.53	0.4965	181597	41.85	0.8150	182334	99.49
0.3185	177868	37.30	0.3545	178616	37.84	0.3920	179364	41.87	0.4275	180112	39.25	0.4630	180860	44.53	0.4970	181608	41.85	0.8155	182345	99.49
0.3190	177879	37.30	0.3550	178627	37.84	0.3925	179375	41.87	0.4280	180123	39.25	0.4635	180871	44.53	0.4975	181619	41.85	0.8160	182356	102.07
0.3195	177890	37.30	0.3555	178638	37.84	0.3930	179386	41.87	0.4285	180134	39.25	0.4640	180882	44.53	0.4980	181630	41.85	0.8165	182367	102.07
0.3200	177901	37.30	0.3560	178649	37.84	0.3935	179397	41.87	0.4290	180145	39.25	0.4645	180893	44.53	0.4985	181641	41.85	0.8170	182378	102.07
0.3205	177912	37.30	0.3565	178660	37.84	0.3940	179408	41.87	0.4295	180156	39.25	0.4650	180904	44.53	0.4995	181652	41.85	0.8175	182389	102.07
0.3210	177923	37.30	0.3570	178671	37.84	0.3945	179419	41.87	0.4300	180167	39.25	0.4655	180915	44.53	0.5005	181663	56.32	0.8185	182400	102.07
0.3215	177934	37.30	0.3575	178682	37.84	0.3950	179430	41.87	0.4305	180178	39.25	0.4660	180926	44.53	0.5015	181674	56.32	0.8185	182411	111.21
0.3220	177945	37.30	0.3585	178693	37.84	0.3955	179441	41.87	0.4310	180189	39.25	0.4665	180937	44.53	0.5020	181685	56.32	0.8185	182422	111.21
0.3225	177956	37.30	0.3590	178704	37.84	0.3960	179452	41.87	0.4315	180200	39.25	0.4670	180948	44.53	0.5025	181696	56.32	0.8185	182433	111.21
0.3235	177967	37.30	0.3595	178715	33.90	0.3965	179463	41.87	0.4320	180211	39.25	0.4675	180959	44.53	0.5030	181707	56.32	0.8185	182444	111.21
0.3240	177978	37.30	0.3600	178726	33.90	0.3975	179474	41.87	0.4325	180222	39.25	0.4680	180970	44.53	0.5035	181718	56.32	0.8185	182455	111.21
0.3245	177989	37.30	0.3605	178737	33.90	0.3980	179485	41.87	0.4330	180233	39.25	0.4685	180981	44.53	0.5040	181729	56.32	0.9340	182466	111.21
0.3250	178000	37.30	0.3610	178748	33.90	0.3985	179496	41.87	0.4335	180244	39.25	0.4690	180992	44.53	0.5045	181740	56.32	0.9345	182477	111.21
0.3255	178011	37.30	0.3615	178759	33.90	0.3990	179507	41.87	0.4340	180255	39.25	0.4695	181003	44.53	0.5050	181751	56.32	0.9350	182488	111.21
0.3260	178022	37.30	0.3620	178770	33.90	0.3995	179518	41.87	0.4345	180266	39.25	0.4700	181014	44.53	0.5060	181762	56.32	0.9355	182499	111.21
0.3265	178033	37.30	0.3625	178781	33.90	0.4000	179529	41.87	0.4350	180277	39.25	0.4705	181025	44.53	0.5070	181773	56.32	0.9360	182510	111.21
0.3270	178044	37.30	0.3630	178792	33.90	0.4005	179540	41.87	0.4355	180288	39.25	0.4710	181036	44.53	0.5080	181784	56.32	0.9370	182521	111.21
0.3275	178055	37.30	0.3635	178803	33.90	0.4010	179551	41.87	0.4360	180299	39.25	0.4715	181047	44.53	0.5090	181795	56.32	0.9380	182532	122.07
0.3280	178066	37.30	0.3640	178814	33.90	0.4015	179562	41.87	0.4370	180310	39.25	0.4720	181058	44.53	0.5100	181806	56.32	0.9390	182543	122.07
0.3285	178077	37.30	0.3645	178825	33.90	0.4020														



Chucking Reamers

STRAIGHT SHANK - STRAIGHT FLUTE



HIGH SPEED STEEL

SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0100 - .0195	152.40	99.59	74.19	48.98	44.24	37.60	34.01	31.64	30.83	28.24	27.39	27.04	26.39
.0196 - .0290	138.56	90.54	67.52	44.52	40.20	35.25	30.93	28.81	26.72	25.65	25.52	25.49	25.39
.0291 - .0390	125.95	82.16	61.35	40.44	36.53	32.06	28.14	26.17	24.27	23.32	22.67	22.33	21.82
.0391 - .0624	113.85	75.79	61.35	39.00	35.15	30.47	26.81	24.90	22.97	21.56	21.22	21.15	21.00
.0626 - .1093	119.86	76.72	59.16	36.87	32.30	26.79	24.27	22.33	20.46	19.30	18.83	18.50	17.86
.1095 - .1249	118.29	75.07	55.61	32.23	28.29	25.87	21.22	19.30	19.02	18.72	18.39	18.07	17.92
.1251 - .1405	125.95	82.16	55.47	40.44	38.08	32.06	28.14	26.17	24.27	23.32	22.72	22.33	21.60
.1407 - .1561	124.03	80.87	61.41	39.20	35.15	30.70	26.81	24.90	23.51	22.97	22.45	21.92	21.37
.1563 - .1718	125.95	78.60	61.06	40.44	36.63	32.06	28.14	26.17	24.27	23.90	23.51	23.32	22.87
.1720 - .1874	120.79	75.41	61.03	37.67	33.85	30.25	26.60	24.60	24.34	23.97	23.62	23.02	22.72
.1876 - .2030	129.34	86.17	67.63	45.26	41.40	36.80	32.93	31.04	28.93	27.39	26.79	26.60	26.40
.2032 - .2187	129.34	86.17	66.89	44.57	40.73	36.05	32.13	30.25	28.29	26.60	26.29	25.97	25.84
.2189 - .2343	129.86	86.84	67.43	45.13	41.26	36.63	32.69	30.76	28.85	27.70	27.28	27.04	26.81
.2345 - .2499	129.86	86.84	64.19	41.87	37.98	33.50	29.66	27.75	25.69	25.52	25.19	24.92	24.82
.2501 - .2968	134.87	91.69	72.22	49.92	46.08	41.18	37.30	35.37	33.33	31.59	31.30	31.01	30.70
.2970 - .3124	131.13	87.99	68.52	46.12	42.24	37.60	33.64	31.66	31.54	31.26	31.11	30.90	30.70
.3126 - .3437	137.75	93.89	74.32	48.15	46.67	43.06	39.32	37.30	35.21	33.66	33.33	33.09	32.84
.3439 - .3593	137.56	94.42	74.89	52.55	48.66	45.66	39.32	37.84	35.91	34.20	33.85	33.58	33.33
.3595 - .3749	133.59	90.33	70.86	48.40	44.57	39.85	36.02	33.90	33.73	33.66	33.44	33.28	33.16
.3751 - .3905	139.85	96.74	77.38	54.84	50.97	46.73	42.75	40.83	38.92	36.87	36.67	36.37	36.05
.3907 - .4218	141.60	98.42	78.90	56.56	52.69	47.62	43.76	41.87	39.88	38.14	37.78	37.60	37.49
.4220 - .4374	138.93	95.83	76.22	53.96	50.12	45.13	41.18	39.24	38.92	38.79	38.63	37.83	37.42
.4376 - .4843	145.36	102.15	82.68	60.35	56.50	51.20	45.43	44.53	43.54	42.18	41.87	41.40	41.04
.4845 - .4999	141.94	98.78	79.26	56.85	53.07	47.81	41.98	41.86	41.53	41.36	41.04	40.88	40.77
.5001 - .5311	205.97	127.93	101.98	75.87	69.44	62.88	58.60	56.32	54.16	53.15	52.47	52.06	51.53
.5313 - .5624	204.82	126.73	100.73	74.66	68.24	61.65	57.41	55.17	52.95	51.87	51.22	50.75	50.51
.5626 - .5937	212.89	134.78	108.76	82.68	77.72	69.74	67.45	63.33	61.03	60.03	59.34	58.90	58.29
.5939 - .6249	213.17	135.01	108.98	82.93	76.52	70.00	65.67	63.60	61.26	60.30	59.55	59.16	58.92
.6251 - .6874	220.78	142.70	116.66	90.61	84.11	80.72	73.23	71.07	68.94	67.82	67.17	66.80	66.59
.6876 - .7187	227.92	149.91	123.85	97.48	91.10	84.75	80.46	78.33	76.19	75.07	74.36	73.83	73.42
.7189 - .7499	230.80	152.73	126.82	100.68	94.31	87.76	83.33	83.25	83.15	83.07	82.77	82.60	82.33
.7501 - .8124	239.90	161.87	135.96	109.83	103.36	96.88	92.52	90.33	88.17	87.11	86.47	85.96	85.40
.8126 - .8437	249.10	170.99	145.10	119.00	112.48	106.07	101.64	99.49	97.37	96.23	95.52	95.14	94.60
.8439 - .8749	251.41	173.34	147.27	121.20	114.74	108.26	103.85	102.07	101.09	98.42	97.72	97.29	95.44
.8751 - .9374	260.86	182.77	156.75	130.69	124.24	117.81	113.36	111.21	109.11	108.78	108.57	108.41	108.21
.9376 - .9687	271.69	192.46	167.61	141.60	135.12	128.63	124.24	122.08	119.93	118.91	118.11	117.86	117.20
.9689 - .9999	273.95	195.88	169.88	143.79	137.36	130.86	126.55	124.42	122.14	121.13	120.41	119.93	119.44
1.0001 - 1.0624	293.98	219.60	211.81	204.05	196.18	188.42	180.61	172.81	165.06	164.03	160.28	158.97	157.62
1.0626 - 1.1249	310.46	236.46	227.92	219.36	210.79	202.24	193.71	185.15	176.61	168.08	167.28	166.46	165.51
1.1251 - 1.1874	331.55	258.62	249.74	241.26	232.76	224.27	216.02	207.30	200.36	190.27	181.78	173.30	164.79
1.1876 - 1.2499	349.97	276.02	266.74	257.56	248.37	239.19	229.97	220.78	211.59	202.42	193.22	184.02	174.84
1.2501 - 1.3749	398.11	320.64	310.63	300.84	291.06	279.81	271.50	261.77	251.96	242.15	239.64	237.15	235.11
1.3751 - 1.4999	440.37	365.39	354.48	343.62	332.68	321.76	310.92	299.98	289.11	278.16	275.20	271.16	266.54

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

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

Chucking Reamers



STRAIGHT SHANK - STRAIGHT FLUTE



M42 COBALT

SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0100 - .0195	220.13	116.37	86.26	56.30	48.78	41.24	36.26	33.74	31.24	30.00	29.26	28.24	28.14
.0196 - .0290	200.15	105.74	78.42	51.18	44.34	37.49	32.93	30.66	28.42	28.29	28.25	28.24	28.14
.0291 - .0390	181.96	96.19	71.32	46.48	40.29	36.04	29.95	27.90	25.84	24.82	24.21	23.76	23.21
.0391 - .0624	165.67	94.74	69.89	45.03	38.80	32.61	28.50	26.44	24.36	23.33	23.20	23.01	22.79
.0626 - .1093	166.81	92.61	67.77	42.92	36.75	30.49	26.39	24.31	22.23	21.22	21.10	21.00	20.83
.1095 - .1249	162.99	88.76	63.97	39.12	32.91	26.74	22.60	21.36	20.15	19.81	19.52	19.26	19.03
.1251 - .1405	170.36	96.15	71.03	46.48	40.29	34.09	29.95	27.90	25.84	24.82	24.21	23.76	23.21
.1407 - .1561	168.95	94.74	69.89	45.03	38.80	32.61	28.50	26.44	24.36	23.33	23.02	22.95	22.77
.1563 - .1718	170.52	96.23	71.39	46.61	40.42	34.20	30.09	28.00	25.90	24.86	24.69	24.50	24.31
.1720 - .1874	169.27	95.09	70.23	45.43	40.28	33.03	28.86	26.81	24.74	24.69	24.52	24.36	24.35
.1876 - .2030	176.21	101.98	77.09	52.30	46.11	39.85	35.77	33.68	31.60	30.56	29.95	29.56	29.40
.2032 - .2343	175.45	101.28	76.44	51.60	45.43	39.24	35.07	33.98	32.89	32.55	32.33	32.06	31.56
.2345 - .2499	172.44	98.42	73.58	48.78	42.56	36.35	32.23	32.03	31.81	31.56	31.28	30.70	30.31
.2501 - .2968	187.83	113.62	88.70	63.97	57.72	51.55	47.32	45.29	43.26	42.22	41.91	41.29	41.18
.2970 - .3124	183.09	108.81	84.00	59.16	52.92	46.75	42.64	42.38	42.13	41.93	41.57	41.52	41.23
.3126 - .3437	190.14	115.86	91.03	66.23	60.03	53.80	49.68	47.61	45.51	45.32	45.06	44.64	44.39
.3439 - .3593	190.49	116.29	91.44	66.62	60.43	54.26	50.06	48.05	46.02	45.68	45.42	45.32	45.03
.3595 - .3749	186.13	111.88	87.07	62.19	56.01	49.78	45.66	45.54	45.42	45.26	22.72	45.17	44.98
.3751 - .3905	203.31	129.12	104.31	79.46	73.23	67.04	62.74	60.76	58.78	57.72	57.09	56.71	56.19
.3907 - .4218	205.91	131.76	106.87	82.05	75.88	69.64	65.51	63.45	61.39	60.43	59.67	59.30	58.78
.4220 - .4374	201.86	127.65	102.84	78.00	71.83	65.59	61.43	59.39	57.31	56.32	55.66	55.27	54.75
.4376 - .4843	211.69	137.48	112.65	87.84	81.65	75.42	71.35	69.29	67.20	66.14	65.51	65.11	64.58
.4845 - .4999	206.34	132.09	107.28	82.44	76.19	70.03	65.93	64.80	63.67	63.50	63.27	63.14	63.04
.5001 - .5311	217.73	142.45	117.86	91.01	88.49	86.12	83.79	81.44	79.07	76.74	74.36	72.02	69.70
.5313 - .5624	219.36	144.84	121.11	93.94	91.16	88.49	85.85	83.20	80.56	77.92	75.26	72.63	69.97
.5626 - .5937	223.51	148.57	124.14	96.80	93.79	90.84	87.90	92.41	82.02	79.07	76.14	73.19	70.24
.5939 - .6249	230.58	156.00	132.29	104.91	102.08	99.49	96.88	94.28	91.66	88.99	86.41	83.79	81.17
.6251 - .6874	237.91	163.06	140.56	113.02	110.48	108.07	105.68	103.27	100.87	98.49	97.03	93.64	91.28
.6876 - .7187	245.13	170.20	146.21	118.51	116.45	114.54	112.48	110.61	108.76	106.83	104.91	104.31	104.09
.7189 - .7499	253.80	179.66	157.30	129.40	126.38	123.39	120.45	117.49	114.54	111.56	108.57	105.63	102.63
.7501 - .8124	267.18	192.43	169.12	142.15	133.26	130.42	127.53	124.69	121.85	119.00	116.11	113.26	110.42
.8126 - .8437	280.63	206.70	182.24	157.09	149.63	147.06	144.61	142.15	139.66	137.15	134.66	132.21	129.73
.8439 - .8749	295.22	220.42	196.40	169.92	160.02	156.64	153.35	150.04	146.73	143.42	140.08	136.83	133.51
.8751 - .9374	307.01	231.90	208.15	180.44	170.36	166.97	163.67	160.31	156.97	153.63	150.28	148.80	147.26
.9376 - .9687	322.75	246.07	222.60	195.59	191.51	187.88	184.02	180.20	176.35	172.47	168.66	166.74	164.93
.9689 - .9999	333.98	259.25	236.25	209.83	204.57	199.42	194.29	189.21	184.10	179.03	173.94	168.81	163.71
1.0001 - 1.0624	359.35	284.55	260.25	233.24	227.52	221.45	216.00	210.28	204.55	198.78	193.05	187.26	181.58
1.0626 - 1.1249	384.98	310.44	286.65	260.26	252.71	245.43	238.08	230.77	223.42	216.14	208.81	201.50	194.19
1.1251 - 1.1874	409.82	333.98	312.32	283.33	276.76	270.30	263.92	257.47	251.04	244.57	238.12	231.71	225.23
1.1876 - 1.2499	435.79	362.38	338.97	310.73	302.38	294.54	286.66	278.86	271.05	263.22	255.41	247.54	239.77
1.2501 - 1.3749	461.97	385.84	360.69	335.05	329.97	324.45	319.80	314.73	309.66	304.58	299.50	299.15	298.48
1.3751 - 1.4999	487.58	412.61	389.23	362.10	358.52	355.16	351.80	349.65	347.51	346.77	346.17	345.35	344.65

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



Chucking Reamers

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
1.0mm	.0394	1/2	4	2-1/2	.0394	188252	24.47	190188	26.78
#60	.0400	1/2	4	2-1/2	.0390	188263	24.47	190199	26.78
#59	.0410	1/2	4	2-1/2	.0390	188274	24.47	190210	26.78
#58	.0420	1/2	4	2-1/2	.0390	188285	24.47	190221	26.78
#57	.0430	1/2	4	2-1/2	.0390	188296	24.47	190232	26.78
#56	.0465	1/2	4	2-1/2	.0455	188307	24.47	190243	26.78
3/64	.0469	1/2	4	2-1/2	.0455	188318	24.47	190254	26.78
#55	.0520	1/2	4	2-1/2	.0510	188329	24.47	190265	26.78
#54	.0550	1/2	4	2-1/2	.0510	188340	24.47	190276	26.78
1.5mm	.0591	1/2	4	2-1/2	.0510	188351	24.47	190287	26.78
#53	.0595	1/2	4	2-1/2	.0585	188362	24.47	190298	26.78
1/16	.0625	1/2	4	2-1/2	.0585	188373	24.47	190309	26.78
#52	.0635	1/2	4	2-1/2	.0585	188384	24.47	190320	26.78
#51	.0670	3/4	4	3	.0660	188395	19.69	190331	21.57
#50	.0700	3/4	4	3	.0660	188406	19.69	190342	21.57
#49	.0730	3/4	4	3	.0660	188417	19.69	190353	21.57
#48	.0760	3/4	4	3	.0720	188428	19.69	190364	21.57
5/64	.0781	3/4	4	3	.0720	188439	19.69	190375	21.57
#47	.0785	3/4	4	3	.0720	188450	19.69	190386	21.57
2.0mm	.0787	3/4	4	3	.0720	188461	19.69	190397	21.57
#46	.0810	3/4	4	3	.0771	188472	19.69	190408	21.57
#45	.0820	3/4	4	3	.0771	188483	19.69	190419	21.57
#44	.0860	3/4	4	3	.0810	188494	19.69	190430	21.57
#43	.0890	3/4	4	3	.0810	188505	19.69	190441	21.57
#42	.0935	3/4	4	3	.0880	188516	19.69	190452	21.57
3/32	.0938	3/4	4	3	.0880	188527	19.52	190463	21.57
#41	.0960	7/8	4	3-1/2	.0928	188538	19.85	190474	21.76
#40	.0980	7/8	4	3-1/2	.0928	188549	19.85	190485	21.76
2.5mm	.0984	7/8	4	3-1/2	.0928	188560	19.85	190496	21.76
#39	.0995	7/8	4	3-1/2	.0928	188571	19.85	190507	21.76
#38	.1015	7/8	4	3-1/2	.0950	188582	19.85	190518	21.76
#37	.1040	7/8	4	3-1/2	.0950	188593	19.85	190529	21.76
#36	.1065	7/8	4	3-1/2	.1030	188604	19.85	190540	21.76
7/64	.1094	7/8	4	3-1/2	.1030	188615	20.42	190551	22.44
#35	.1100	7/8	4	3-1/2	.1030	188626	20.42	190562	22.44
#34	.1110	7/8	4	3-1/2	.1055	188637	20.42	190573	22.44
#33	.1130	7/8	4	3-1/2	.1055	188648	20.42	190584	22.44
#32	.1160	7/8	4	3-1/2	.1120	188659	20.42	190595	22.44
3.0mm	.1181	7/8	4	3-1/2	.1120	188670	20.42	190606	22.44
#31	.1200	7/8	4	3-1/2	.1120	188681	20.42	190617	22.44
o/u	.1240	7/8	4	3-1/2	.1190	188692	20.42	190628	22.44
1/8	.1250	7/8	4	3-1/2	.1190	188703	18.42	190639	20.19
o/u	.1260	7/8	4	3-1/2	.1190	188714	20.42	190650	22.44
#30	.1285	7/8	4	3-1/2	.1190	188725	20.42	190661	22.44
#29	.1360	1	4	4	.1275	188736	24.47	190672	26.79
3.5mm	.1378	1	4	4	.1350	188747	24.47	190683	26.79

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

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

HSS & COBALT REAMERS

Chucking Reamers



STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
#28	.1405	1	4	4	.1350	188758	24.47	190694	26.79
9/64	.1406	1	4	4	.1350	188769	24.47	190705	26.79
#27	.1440	1	4	4	.1350	188780	24.47	190716	26.79
#26	.1470	1	4	4	.1430	188791	24.47	190727	26.79
#25	.1495	1	4	4	.1430	188802	24.47	190738	26.79
#24	.1520	1	4	4	.1460	188813	25.46	190749	26.79
#23	.1540	1	4	4	.1460	188824	25.46	190760	26.79
5/32	.1562	1	4	4	.1510	188835	25.46	190771	26.79
#22	.1570	1	6	4	.1510	188846	25.46	190782	26.79
4.0mm	.1575	1	6	4	.1510	188857	25.46	190793	26.79
#21	.1590	1-1/8	6	4-1/2	.1530	188868	26.12	190804	28.63
#20	.1610	1-1/8	6	4-1/2	.1530	188879	26.12	190815	28.63
#19	.1660	1-1/8	6	4-1/2	.1595	188890	26.12	190826	28.61
#18	.1695	1-1/8	6	4-1/2	.1595	188901	26.12	190837	28.61
11/64	.1719	1-1/8	6	4-1/2	.1645	188912	26.12	190848	28.61
#17	.1730	1-1/8	6	4-1/2	.1645	188923	26.12	190859	28.61
#16	.1770	1-1/8	6	4-1/2	.1704	188934	26.12	190870	28.61
4.5mm	.1772	1-1/8	6	4-1/2	.1704	188945	26.12	190881	28.61
#15	.1800	1-1/8	6	4-1/2	.1755	188956	26.12	190892	28.61
#14	.1820	1-1/8	6	4-1/2	.1755	188967	26.12	190903	28.61
#13	.1850	1-1/8	6	4-1/2	.1805	188978	26.12	190914	28.61
o/u	.1865	1-1/8	6	4-1/2	.1805	188989	26.12	190925	28.61
3/16	.1875	1-1/8	6	4-1/2	.1805	189000	24.81	190936	27.18
o/u	.1885	1-1/8	6	4-1/2	.1805	189011	26.12	190947	28.61
#12	.1890	1-1/8	6	4-1/2	.1805	189022	26.12	190958	28.61
#11	.1910	1-1/4	6	5	.1860	189033	29.26	190969	32.07
#10	.1935	1-1/4	6	5	.1860	189044	29.26	190980	32.07
#9	.1960	1-1/4	6	5	.1895	189055	29.26	190991	32.07
5.0mm	.1969	1-1/4	6	5	.1895	189066	29.26	191002	32.07
#8	.1990	1-1/4	6	5	.1895	189077	29.26	191013	32.07
#7	.2010	1-1/4	6	5	.1895	189088	29.26	191024	32.07
13/64	.2031	1-1/4	6	5	.1945	189099	29.26	191035	32.07
#6	.2040	1-1/4	6	5	.1945	189110	29.26	191046	32.07
#5	.2055	1-1/4	6	5	.2016	189121	29.26	191057	32.07
#4	.2090	1-1/4	6	5	.2016	189132	29.26	191068	32.07
#3	.2130	1-1/4	6	5	.2075	189143	29.26	191079	32.07
5.5mm	.2165	1-1/4	6	5	.2075	189154	29.26	191090	32.07
7/32	.2188	1-1/4	6	5	.2075	189165	29.26	191101	32.07
#2	.2210	1-1/2	6	6	.2173	189176	30.08	191112	32.96
#1	.2280	1-1/2	6	6	.2173	189187	30.08	191123	32.96
A	.2340	1-1/2	6	6	.2265	189198	30.08	191134	32.96
15/64	.2344	1-1/2	6	6	.2265	189209	30.08	191145	32.96
6.0mm	.2362	1-1/2	6	6	.2265	189220	30.29	191156	34.69
B	.2380	1-1/2	6	6	.2329	189231	30.29	191167	34.69
C	.2420	1-1/2	6	6	.2329	189242	30.29	191178	34.69
D	.2460	1-1/2	6	6	.2329	189253	30.29	191189	31.55

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



Chucking Reamers

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
o/u	.2490	1-1/2	6	6	.2405	189264	32.32	191200	37.17
1/4	.2500	1-1/2	6	6	.2405	189275	25.78	191211	29.50
o/u	.2510	1-1/2	6	6	.2405	189286	32.32	191222	37.17
6.5mm	.2559	1-1/2	6	6	.2405	189297	30.28	191233	34.69
F	.2570	1-1/2	6	6	.2485	189308	30.28	191244	34.69
G	.2610	1-1/2	6	6	.2485	189319	30.28	191255	34.69
17/64	.2656	1-1/2	6	6	.2485	189330	33.81	191266	42.84
H	.2660	1-1/2	6	6	.2485	189341	33.81	191277	42.84
I	.2720	1-1/2	6	6	.2485	189352	33.81	191288	42.84
7.0mm	.2756	1-1/2	6	6	.2485	189363	33.81	191299	42.84
J	.2770	1-1/2	6	6	.2485	189374	33.81	191310	42.84
K	.2810	1-1/2	6	6	.2485	189385	33.81	191321	42.84
9/32	.2812	1-1/2	6	6	.2485	189396	32.08	191332	40.72
L	.2900	1-1/2	6	6	.2792	189407	33.81	191343	42.84
M	.2950	1-1/2	6	6	.2792	189418	33.81	191354	42.84
7.5mm	.2953	1-1/2	6	6	.2792	189429	33.81	191365	42.84
19/64	.2969	1-1/2	6	6	.2792	189440	33.81	191376	42.84
N	.3020	1-1/2	6	6	.2792	189451	33.81	191387	42.84
o/u	.3115	1-1/2	6	6	.2792	189462	32.08	191398	40.72
5/16	.3125	1-1/2	6	6	.2792	189473	30.39	191409	38.57
o/u	.3135	1-1/2	6	6	.2792	189484	32.08	191420	40.72
8.0mm	.3150	1-1/2	6	6	.2792	189495	33.81	191431	42.84
O	.3160	1-1/2	6	6	.2792	189506	33.81	191442	42.84
P	.3230	1-1/2	6	6	.2792	189517	36.14	191453	46.17
21/64	.3281	1-1/2	6	6	.2792	189528	36.14	191464	46.17
Q	.3320	1-1/2	6	6	.2792	189539	36.14	191475	46.17
8.5mm	.3346	1-1/2	6	6	.2792	189550	36.14	191486	46.17
R	.3390	1-1/2	6	6	.2792	189561	36.14	191497	46.17
11/32	.3438	1-1/2	6	6	.2792	189572	36.14	191508	46.17
S	.3480	1-3/4	6	6	.3105	189583	36.46	191519	46.77
9.0mm	.3543	1-3/4	6	7	.3105	189594	36.46	191530	46.77
T	.3580	1-3/4	6	7	.3105	189605	36.46	191541	46.77
23/64	.3594	1-3/4	6	7	.3105	189616	36.46	191552	46.77
U	.3680	1-3/4	6	7	.3105	189627	36.46	191563	46.77
9.5mm-o/u	.3740	1-3/4	6	7	.3105	189638	34.65	191574	44.42
3/8	.3750	1-3/4	6	7	.3105	189649	32.82	191585	42.12
o/u	.3760	1-3/4	6	7	.3105	189660	34.65	191596	44.42
V	.3770	1-3/4	6	7	.3105	189671	39.69	191607	58.92
W	.3860	1-3/4	6	7	.3105	189682	39.69	191618	58.92
25/64	.3906	1-3/4	6	7	.3105	189693	39.69	191629	58.92
10.0mm	.3937	1-3/4	6	7	.3105	189704	39.69	191640	58.92
X	.3970	1-3/4	6	7	.3105	189715	39.69	191651	58.92
Y	.4040	1-3/4	6	7	.3105	189726	41.16	191662	58.92
13/32	.4062	1-3/4	6	7	.3105	189737	41.16	191673	58.92
Z	.4130	1-3/4	6	7	.3730	189748	41.16	191684	58.92
10.5mm	.4134	1-3/4	6	7	.3730	189759	41.16	191695	58.92

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

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

Chucking Reamers



STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL & M42 COBALT

SIZE	DEC. EQUIV.	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	HSS	LIST PRICE	M42 COBALT	LIST PRICE
27/64	.4219	1-3/4	6	7	.3730	189770	41.16	191706	58.92
11.0mm	.4331	1-3/4	6	7	.3730	189781	41.16	191717	58.92
o/u	.4365	1-3/4	6	7	.3730	189792	41.16	191728	58.92
7/16	.4375	1-3/4	6	7	.3730	189803	39.09	191739	55.96
o/u	.4385	1-3/4	6	7	.3730	189814	41.16	191750	58.92
11.5mm	.4528	1-3/4	6	7	.3730	189825	44.86	191761	67.52
29/64	.4531	1-3/4	6	7	.3730	189836	44.86	191772	67.52
15/32	.4688	1-3/4	6	7	.3730	189847	44.86	191783	67.52
12.0mm	.4724	2	6	8	.4355	189858	44.86	191794	67.52
31/64	.4844	2	6	8	.4355	189869	44.86	191805	67.52
12.5mm	.4921	2	6	8	.4355	189880	44.86	191816	67.52
o/u	.4990	2	6	8	.4355	189891	44.86	191827	67.52
1/2	.5000	2	6	8	.4355	189902	42.55	191838	64.13
o/u	.5010	2	6	8	.4355	189913	44.86	191849	67.52
17/32	.5312	2	6	8	.4355	189924	52.91	191860	75.75
9/16	.5625	2	8	8	.4355	189935	52.91	191871	75.75
19/32	.5938	2	8	8	.4355	189946	52.91	191882	75.75
5/8	.6250	2-1/4	8	9	.5615	189957	61.71	191893	88.38
21/32	.6562	2-1/4	8	9	.5615	189968	64.93	191904	99.93
11/16	.6875	2-1/4	8	9	.5615	189979	69.78	191915	99.93
23/32	.7188	2-1/4	8	9	.5615	189990	77.91	191926	111.52
3/4	.7500	2-1/2	8	9-1/2	.6240	190001	77.91	191937	112.14
25/32	.7812	2-1/2	8	9-1/2	.6240	190012	84.46	191948	120.99
13/16	.8125	2-1/2	8	9-1/2	.6240	190023	84.46	191959	120.99
27/32	.8438	2-1/2	8	9-1/2	.6240	190034	99.96	191970	143.16
7/8	.8750	2-5/8	8	10	.7490	190045	102.25	191981	146.45
29/32	.9062	2-5/8	8	10	.7490	190056	110.22	191992	157.82
15/16	.9375	2-5/8	8	10	.7490	190067	110.22	192003	157.82
31/32	.9688	2-5/8	8	10	.7490	190078	123.43	192014	176.74
1	1.0000	2-3/4	8	10-1/2	.8740	190089	124.60	192025	178.16
1-1/16	1.0625	2-3/4	8	10-1/2	.8740	190100	138.13	-	-
1-1/8	1.1250	2-7/8	8	11	.8740	190111	146.82	-	-
1-3/16	1.1875	2-7/8	8	11	.9990	190122	171.91	-	-
1-1/4	1.2500	3	8	11-1/2	.9990	190133	182.21	-	-
1-5/16	1.3125	3	10	11-1/2	.9990	190144	212.55	-	-
1-3/8	1.3750	3-1/4	10	12	.9990	190155	223.37	-	-
1-7/16	1.4375	3-1/4	10	12	1.2490	190166	239.53	-	-
1-1/2	1.5000	3-1/2	10	12-1/2	1.2490	190177	257.87	-	-
1-9/16	1.5625	3-1/2	12	13	1.2490	192036	365.20	-	-
1-5/8	1.6250	3-1/2	12	13	1.2490	192047	365.20	-	-
1-11/16	1.6875	4	12	13-1/2	1.2490	192058	419.35	-	-
1-3/4	1.7500	4	12	13-1/2	1.2490	192069	419.35	-	-
1-13/16	1.8125	4	12	14	1.4990	192080	482.98	-	-
1-7/8	1.8750	4	12	14	1.4990	192091	482.98	-	-
1-15/16	1.9375	4	12	14	1.4990	192102	565.41	-	-
2	2.0000	4	12	14	1.4990	192113	565.41	-	-

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



Chucking Reamers

STRAIGHT SHANK - SPIRAL FLUTE - RIGHT HAND CUT

RIGHT HAND SPIRAL
HIGH SPEED STEEL



LEFT HAND SPIRAL
HIGH SPEED STEEL



SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0391 - .0624	130.89	87.12	70.52	44.89	40.43	35.03	30.90	28.64	26.44	24.80	24.66	24.57	24.47
.0626 - .1093	137.82	88.17	68.03	42.42	37.97	32.43	27.89	25.52	23.46	22.16	21.63	21.28	20.57
.1095 - .1249	135.02	86.34	63.89	37.05	32.55	29.75	24.37	22.16	21.91	21.55	21.13	20.78	20.61
.1251 - .1405	144.85	94.61	72.22	46.48	42.13	36.93	32.33	30.11	27.89	26.80	26.29	25.67	25.07
.1407 - .1561	142.62	92.93	70.63	44.89	40.43	35.35	30.90	28.64	27.04	26.44	25.84	25.19	24.57
.1563 - .1718	144.85	90.38	70.77	46.48	42.13	36.93	32.33	30.11	27.89	27.46	27.04	26.80	26.29
.1720 - .1874	138.90	86.72	70.19	43.33	38.92	34.79	30.63	28.26	27.95	27.52	27.19	26.49	26.15
.1876 - .2030	148.74	99.08	77.79	52.06	47.63	42.24	37.85	35.60	31.86	31.54	30.76	30.63	30.35
.2032 - .2187	148.74	99.08	76.95	51.26	46.81	41.52	36.93	34.79	32.55	30.63	30.25	29.88	29.72
.2189 - .2343	149.34	99.87	77.55	51.86	47.48	42.13	37.60	35.40	33.19	31.84	31.34	31.09	30.90
.2345 - .2499	149.34	99.87	73.79	48.10	43.71	38.52	34.66	31.89	31.59	31.48	30.91	30.47	30.29
.2501 - .2968	148.36	100.87	79.46	54.92	50.68	45.26	41.04	38.92	36.64	35.60	34.72	34.45	33.85
.2970 - .3124	144.26	96.74	75.38	50.73	46.46	41.34	36.98	34.89	34.68	34.48	34.00	33.90	33.84
.3126 - .3437	150.69	103.28	81.77	57.15	52.95	47.33	43.26	41.04	38.92	37.02	36.64	36.39	36.14
.3439 - .3593	151.28	103.87	82.35	57.75	53.52	48.10	43.83	41.63	39.50	37.63	37.23	36.93	36.64
.3595 - .3749	146.95	99.34	77.93	53.22	49.06	43.83	39.61	37.30	37.10	36.98	36.77	36.63	36.47
.3751 - .3905	153.84	106.36	85.11	60.32	56.11	51.37	47.02	44.93	42.83	40.57	40.32	39.98	39.69
.3907 - .4218	155.75	108.26	86.84	62.19	57.99	52.35	48.15	46.02	43.92	41.96	41.56	41.34	41.24
.4220 - .4374	152.83	105.39	83.86	59.39	55.17	49.62	45.26	43.17	42.72	42.18	41.87	41.40	41.18
.4376 - .4843	159.85	112.39	90.94	66.39	62.15	56.32	49.98	48.98	47.92	46.40	46.02	45.54	45.17
.4845 - .4999	156.12	108.65	87.19	62.53	58.40	52.62	46.22	45.91	45.68	45.31	45.17	44.96	44.82
.5001 - .5311	226.56	140.75	112.15	83.42	76.43	69.22	64.45	61.98	59.60	58.43	57.71	57.25	56.66
.5313 - .5624	225.31	139.42	110.80	82.11	75.06	67.79	63.13	60.66	58.26	57.09	56.35	55.82	55.27
.5626 - .5937	234.17	148.25	119.61	90.94	83.86	76.74	71.95	69.64	67.08	66.02	65.25	64.75	64.15
.5939 - .6249	234.46	157.00	119.93	91.21	84.16	77.01	72.26	69.94	67.40	66.29	65.55	65.09	64.40
.6251 - .6874	242.85	157.00	128.32	99.68	92.54	88.79	80.57	78.22	75.87	74.61	73.88	73.47	72.84
.6876 - .7187	250.67	164.90	136.28	107.21	100.22	93.23	88.52	86.17	83.81	82.60	81.81	81.23	80.76
.7189 - .7499	253.85	168.02	139.47	110.78	103.77	96.52	91.69	89.34	86.91	85.77	84.98	84.62	83.71
.7501 - .8124	263.94	178.01	149.59	120.80	113.69	106.53	101.73	99.34	96.98	95.83	95.10	94.60	94.00
.8126 - .8437	274.02	188.09	159.58	130.89	123.74	116.66	111.81	109.45	107.08	105.86	105.09	104.71	104.03
.8439 - .8749	276.54	190.69	161.99	133.29	126.18	119.09	114.22	111.76	109.58	108.26	107.51	107.07	106.57
.8751 - .9374	286.93	201.08	172.39	143.79	136.66	129.58	124.48	122.38	120.00	118.80	118.06	117.89	116.95
.9376 - .9687	298.91	215.64	184.42	155.75	148.59	141.50	136.66	134.31	131.89	130.82	129.91	129.68	128.94
.9689 - .9999	301.38	215.49	186.84	158.17	151.11	143.95	139.17	136.86	134.38	133.24	132.39	131.89	131.39
1.0001 - 1.0624	323.37	241.56	232.99	224.43	215.83	207.26	198.70	190.16	181.53	172.92	164.34	155.75	147.20
1.0626 - 1.1249	341.49	260.10	250.67	241.28	231.89	222.49	213.09	203.67	194.26	184.84	169.58	166.07	156.63
1.1251 - 1.1874	364.72	284.52	274.73	265.37	256.01	246.64	237.36	228.00	218.65	209.29	199.95	190.66	181.29
1.1876 - 1.2499	384.98	303.59	293.41	283.31	273.20	263.11	252.96	242.85	232.76	222.62	217.39	202.43	192.31
1.2501 - 1.3749	437.90	352.68	341.67	330.93	320.12	294.85	298.66	287.93	277.12	266.38	255.63	244.87	228.22
1.3751 - 1.4999	484.39	401.94	389.96	377.97	365.95	353.98	341.96	330.02	317.97	305.98	293.98	282.02	270.00

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

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

HSS REAMERS



Chucking Reamers

STRAIGHT SHANK - RIGHT HAND SPIRAL - RIGHT HAND CUT



M42 COBALT

SPECIAL SIZES - QUANTITY PRICING

SIZE RANGE	1	2	3-5	6-7	8-11	12-17	18-23	24-35	36-47	48-59	60-71	72-95	96+
.0391 - .0624	168.93	102.07	77.27	52.43	46.24	40.05	35.90	33.84	31.79	30.70	30.10	29.72	29.15
.0626 - .1093	170.86	96.66	71.88	46.97	40.78	34.56	30.45	28.35	26.29	25.25	24.66	24.22	22.25
.1095 - .1249	169.83	95.60	70.79	45.93	39.73	33.55	29.40	27.35	25.25	24.22	23.62	23.20	22.65
.1251 - .1405	171.07	96.59	71.62	48.07	41.18	35.40	34.08	30.09	29.34	28.51	27.86	27.28	26.80
.1407 - .1561	175.10	99.77	72.78	50.12	44.37	38.74	35.01	32.33	30.29	29.14	28.81	27.80	26.81
.1563 - .1718	176.35	102.06	74.18	52.43	46.24	40.05	35.90	33.84	31.79	30.70	30.10	29.64	29.15
.1720 - .1874	177.16	102.94	78.08	53.24	47.10	40.87	36.75	34.66	32.56	31.56	30.95	30.49	29.98
.1876 - .2030	178.75	104.15	79.72	54.78	48.26	42.54	38.07	35.87	34.21	32.91	32.54	32.20	32.06
.2032 - .2187	179.93	105.78	80.96	56.15	50.02	43.51	40.04	37.14	36.12	34.21	33.55	33.64	33.16
.2189 - .2343	181.53	107.28	82.44	57.62	51.38	45.18	41.04	38.99	36.93	35.90	35.25	34.83	34.34
.2345 - .2499	179.50	105.41	80.65	55.76	49.56	43.36	39.24	37.14	35.07	35.01	34.89	34.83	34.68
.2501 - .2968	188.42	114.22	89.39	64.58	58.36	52.17	48.05	45.93	43.86	43.54	43.33	43.04	42.86
.2970 - .3124	185.89	111.66	86.86	61.99	55.81	49.62	45.47	43.38	43.27	43.19	43.08	42.89	42.87
.3126 - .3437	191.32	114.87	91.04	65.83	58.26	53.48	48.40	48.11	47.78	47.24	46.87	46.41	46.15
.3439 - .3593	193.28	119.02	94.45	69.34	63.14	56.95	52.80	50.73	48.66	47.63	47.02	46.96	46.77
.3595 - .3749	192.61	118.41	93.55	68.74	62.53	56.32	52.21	50.12	48.08	47.02	46.87	46.73	46.77
.3751 - .3905	201.80	127.93	102.92	77.01	70.83	64.62	61.35	60.53	59.79	59.54	59.34	59.10	58.92
.3907 - .4218	208.71	134.53	109.72	84.91	78.66	72.47	68.32	66.24	64.18	63.14	62.53	62.15	61.46
.4220 - .4374	207.88	133.63	108.81	84.00	77.77	71.59	67.42	65.34	63.30	62.23	61.65	61.24	60.66
.4376 - .4843	212.93	138.67	113.86	88.99	82.80	76.58	72.47	70.42	68.32	68.10	68.02	67.72	67.42
.4845 - .4999	209.53	135.35	110.50	85.71	79.46	73.23	69.11	68.89	68.62	68.32	67.93	67.59	67.54
.5001 - .5311	279.97	193.71	163.27	128.24	122.67	117.01	111.42	105.78	100.20	94.60	88.96	83.33	77.75
.5313 - .5624	278.71	192.62	163.55	128.53	122.89	117.01	111.69	106.10	100.47	94.88	89.24	83.66	78.05
.5626 - .5937	287.61	201.66	171.77	132.24	126.27	120.21	114.22	108.21	102.23	96.20	90.19	84.16	78.16
.5939 - .6249	287.93	201.96	172.09	138.93	133.48	128.00	122.51	117.01	111.56	106.07	100.59	95.10	89.65
.6251 - .6874	294.98	209.20	183.00	145.91	140.84	135.76	130.70	125.63	120.54	115.46	110.42	105.33	100.24
.6876 - .7187	304.17	218.30	191.27	156.97	151.88	146.81	141.73	136.66	131.59	126.53	121.45	116.37	111.29
.7189 - .7499	307.54	223.56	196.95	157.59	152.50	147.44	142.35	137.28	132.21	127.14	122.04	116.97	111.91
.7501 - .8124	317.13	231.61	203.74	167.30	162.11	156.52	151.69	146.47	141.26	136.02	130.87	125.63	120.44
.8126 - .8437	327.28	240.71	213.10	189.66	184.19	178.89	173.59	168.25	162.94	157.60	152.33	146.98	141.67
.8439 - .8749	330.02	244.20	214.90	192.16	186.83	181.59	176.31	171.04	165.80	160.52	155.25	149.95	144.72
.8751 - .9374	340.38	254.57	226.52	202.72	197.40	192.17	186.99	181.72	176.47	171.23	165.98	160.76	155.53
.9376 - .9687	352.17	265.50	237.14	212.15	207.78	203.36	199.00	194.59	190.23	185.87	181.44	177.16	172.69
.9689 - .9999	355.08	268.99	240.13	214.60	210.06	205.60	201.15	196.70	192.22	187.75	183.32	178.85	174.39

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

COBALT REAMERS

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

Expansion Reamers



STRAIGHT SHANK



HIGH SPEED STEEL

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	3/4	6	7	5/16	194456	108.15
13/32	3/4	6	7	5/16	194467	115.20
7/16	7/8	6	7	3/8	194478	115.20
15/32	7/8	6	8	27/64	194489	119.62
1/2	1	6	8	7/16	194500	121.75
17/32	1	6	8	7/16	194511	126.91
9/16	1-1/8	6	8	7/16	194522	130.13
19/32	1-1/8	6	8	7/16	194533	132.11
5/8	1-1/4	6	9	9/16	194544	136.13
21/32	1-1/4	6	9	9/16	194555	141.57
11/16	1-1/4	6	9	9/16	194566	142.56
23/32	1-1/4	6	9	9/16	194577	151.80
3/4	1-3/8	6	9-1/2	5/8	194588	157.05
25/32	1-3/8	8	9-1/2	5/8	194599	166.27
13/16	1-3/8	8	9-1/2	5/8	194610	172.65
27/32	1-3/8	8	9-1/2	5/8	194621	181.89
7/8	1-1/2	8	10	3/4	194632	185.19

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
29/32	1-1/2	8	10	3/4	194643	195.04
15/16	1-1/2	8	10	3/4	194654	204.17
31/32	1-1/2	8	10	3/4	194665	213.39
1	1-5/8	8	10-1/2	7/8	194676	225.07
1-1/32	1-5/8	8	10-1/2	7/8	194687	313.17
1-1/16	1-5/8	8	10-1/2	7/8	194698	248.79
1-3/32	1-5/8	8	10-1/2	7/8	194709	260.61
1-1/8	1-3/4	8	11	7/8	194720	272.25
1-5/32	1-3/4	8	11	7/8	194731	275.94
1-3/16	1-3/4	8	11	1	194742	286.71
1-7/32	1-3/4	8	11	1	194753	297.16
1-1/4	1-7/8	8	11-1/2	1	194764	309.04
1-5/16	1-7/8	8	11-1/2	1	194775	319.36
1-3/8	2	8	12	1	194786	331.10
1-7/16	2	8	12	1-1/4	194797	344.22
1-1/2	2-1/8	8	12-1/2	1-1/4	194808	358.73
-	-	-	-	-	-	-

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	122.70
13/32	3/4	6	7	5/16	1	194830	142.28
7/16	7/8	6	7	3/8	1	194841	129.89
15/32	7/8	6	8	27/64	1	194852	132.98
1/2	1	6	8	7/16	1	194863	135.65
17/32	1	6	8	7/16	1	194874	141.02
9/16	1-1/8	6	8	7/16	1	194885	141.02
19/32	1-1/8	6	8	7/16	1	194896	146.17
5/8	1-1/4	6	9	9/16	2	194907	151.40
21/32	1-1/4	6	9	9/16	2	194918	155.57
11/16	1-1/4	6	9	9/16	2	194929	156.50
23/32	1-1/4	6	9	9/16	2	194940	166.95
3/4	1-3/8	6	9-1/2	5/8	2	194951	172.12
25/32	1-3/8	8	9-1/2	5/8	2	194962	180.02
13/16	1-3/8	8	9-1/2	5/8	2	194973	182.71
27/32	1-3/8	8	9-1/2	5/8	2	194984	193.37
7/8	1-1/2	8	10	3/4	2	194995	200.97

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	211.42
15/16	1-1/2	8	10	3/4	3	195017	216.68
31/32	1-1/2	8	10	3/4	3	195028	225.83
1	1-5/8	8	10-1/2	7/8	3	195039	238.83
1-1/32	1-5/8	8	10-1/2	7/8	3	195050	247.99
1-1/16	1-5/8	8	10-1/2	7/8	3	195061	259.85
1-3/32	1-5/8	8	10-1/2	7/8	3	195072	271.43
1-1/8	1-3/4	8	11	7/8	3	195083	280.80
1-5/32	1-3/4	8	11	7/8	3	195094	292.40
1-3/16	1-3/4	8	11	1	3	195105	304.06
1-7/32	1-3/4	8	11	1	3	195116	315.78
1-1/4	1-7/8	8	11-1/2	1	4	195127	330.38
1-5/16	1-7/8	8	11-1/2	1	4	195138	343.32
1-3/8	2	8	12	1	4	195149	357.56
1-7/16	2	8	12	1-1/4	4	195160	378.53
1-1/2	2-1/8	8	12-1/2	1-1/4	4	195171	391.48
-	-	-	-	-	-	-	-

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

MADE IN THE USA

HSS EXPANSION REAMERS

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

Reamers



TAPER PIPE REAMERS - LEFT HAND SPIRAL - RIGHT HAND CUT



HIGH SPEED STEEL

SIZE	DIAMETER SMALL END	DIAMETER LARGE END	# OF FLUTES	THREAD OR FLUTE LENGTH	OVERALL LENGTH	SHANK DIA.	SIZE OF SQUARE	ITEM#	LIST PRICE
1/16	.2320	.2750	6	3/4	2-1/8	.3125	.235	197470	66.01
1/8	.3160	.3620	6	3/4	2-1/8	.4375	.328	197481	61.53
1/4	.4060	.4720	6	1-1/16	2-7/16	.5625	.421	197492	70.45
3/8	.5400	.6060	6	1-1/16	2-9/16	.7000	.531	197503	79.76
1/2	.6650	.7510	6	1-3/8	3-1/8	.6875	.515	197514	100.75
3/4	.8760	.9620	8	1-3/8	3-1/4	.9063	.679	197525	139.71
1	1.1030	1.2120	8	1-3/4	3-3/4	1.1250	.843	197536	205.54
1-1/4	1.4440	1.5530	10	1-3/4	4	1.3125	.984	197547	346.22
1-1/2	1.6840	1.7930	12	1-3/4	4-1/4	1.5000	1.125	197558	437.77
2	2.1590	2.2680	12	1-3/4	4-1/2	1.8750	1.406	197569	584.74

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	52.77	196579	54.77	196348	48.96
6/0	.0611	.0806	4	196128	52.77	196590	54.77	196359	46.12
5/0	.0719	.0966	4	196139	48.11	196601	52.77	196370	47.82
4/0	.0869	.1142	4	196150	48.11	196612	52.77	196381	47.82
3/0	.1029	.1302	4	196161	48.11	196623	52.77	196392	43.19
2/0	.1137	.1462	4	196172	43.03	196634	46.12	196403	43.68
0	.1287	.1638	4	196183	41.39	196645	44.06	196414	44.76
1	.1447	.1798	6	196194	40.08	196656	44.76	196425	45.42
2	.1605	.2008	6	196205	40.08	196667	44.76	196436	51.43
3	.1813	.2294	6	196216	40.08	196678	44.76	196447	53.15
4	.2071	.2604	6	196227	44.76	196689	48.79	196458	59.84
5	.2409	.2994	6	196238	48.11	196700	52.05	196469	65.47
6	.2773	.3540	6	196249	58.07	196711	64.12	196480	76.83
7	.3297	.4220	6	196260	74.81	196722	81.09	196491	94.85
8	.3971	.5050	6	196271	78.25	196733	104.86	196502	111.27
9	.4805	.6066	6	196282	116.24	196744	126.54	196513	122.26
10	.5799	.7216	6	196293	127.60	196755	140.26	196524	155.23
11	.7060	.8780	8	196304	135.99	196766	149.63	196535	164.54
12	.8420	1.0500	8	196315	210.42	196777	231.46	196546	254.72
13	1.0090	1.2590	10	196326	408.14	196788	448.96	196557	493.42
14	1.2500	1.5420	10	196337	653.97	196799	725.77	196568	796.94

HSS - TAPER PIPE & TAPER PIN REAMERS



Reamers

CAPSCREW COUNTERBORES HIGH SPEED STEEL



STANDARD • 1/64 o/s • 1/32 o/s

SIZE	TOLERANCE	PILOT SIZE	PILOT LENGTH	FLUTE SIZE	BODY LENGTH	OVERALL LENGTH	ITEM#	LIST PRICE
4	std.	.1120	1/8	.1830	9/16	3-7/8	195655	30.28
4	1/64 o/s	.1270	1/8	.1990	9/16	3-7/8	195809	30.28
4	1/32 o/s	.1430	1/8	.2150	9/16	3-7/8	195963	30.28
5	std.	.1250	5/32	.2050	5/8	4-1/8	195666	30.28
5	1/64 o/s	.1400	5/32	.2210	5/8	4-1/8	195820	30.28
5	1/32 o/s	.1560	5/32	.2370	5/8	4-1/8	195974	30.28
6	std.	.1380	3/16	.2270	3/4	4-5/8	195677	32.07
6	1/64 o/s	.1530	3/16	.2430	3/4	4-5/8	195831	32.07
6	1/32 o/s	.1690	3/16	.2590	3/4	4-5/8	195985	32.07
8	std.	.1640	7/32	.2700	3/4	5	195688	34.36
8	1/64 o/s	.1790	7/32	.2860	3/4	5	195842	34.36
8	1/32 o/s	.1950	7/32	.3020	3/4	5	195996	34.36
10	std.	.1900	1/4	.3120	7/8	5-1/4	195699	35.10
10	1/64 o/s	.2050	1/4	.3280	7/8	5-1/4	195853	35.10
10	1/32 o/s	.2210	1/4	.3440	7/8	5-1/4	196007	35.10
1/4	std.	.2500	9/32	.3800	1	5-5/8	195710	36.89
1/4	1/64 o/s	.2650	9/32	.3960	1	5-5/8	195864	36.89
1/4	1/32 o/s	.2810	9/32	.4120	1	5-5/8	196018	36.89
5/16	std.	.3125	5/16	.4740	1	6-1/8	195721	46.09
5/16	1/64 o/s	.3280	5/16	.4890	1	6-1/8	195875	46.09
5/16	1/32 o/s	.3430	5/16	.5040	1	6-1/8	196029	46.09
3/8	std.	.3750	3/8	.5690	1-1/4	6-1/2	195732	50.36
3/8	1/64 o/s	.3900	3/8	.5850	1-1/4	6-1/2	195886	50.36
3/8	1/32 o/s	.4060	3/8	.6010	1-1/4	6-1/2	196040	50.36
7/16	std.	.4370	7/16	.6610	1-1/4	7	195743	60.56
7/16	1/64 o/s	.4520	7/16	.6760	1-1/4	7	195897	60.56
7/16	1/32 o/s	.4680	7/16	.6910	1-1/4	7	196051	60.56
1/2	std.	.5000	1/2	.7550	1-1/2	7-1/2	195754	69.33
1/2	1/64 o/s	.5150	1/2	.7710	1-1/2	7-1/2	195908	69.33
1/2	1/32 o/s	.5310	1/2	.7870	1-1/2	7-1/2	196062	69.33
5/8	std.	.6250	5/8	.9690	1-1/2	7-5/8	195765	113.10
5/8	1/64 o/s	.6400	5/8	.9840	1-1/2	7-5/8	195919	113.10
5/8	1/32 o/s	.6560	5/8	1.0000	1-1/2	7-5/8	196073	113.10
3/4	std.	.7500	3/4	1.1560	1-5/8	7-3/4	195776	131.58
3/4	1/64 o/s	.7650	3/4	1.1720	1-5/8	7-3/4	195930	131.58
3/4	1/32 o/s	.7810	3/4	1.1880	1-5/8	7-3/4	196084	131.58
7/8	std.	.8750	7/8	1.3440	1-7/8	8	195787	160.26
7/8	1/64 o/s	.8910	7/8	1.3590	1-7/8	8	195941	160.26
7/8	1/32 o/s	.9060	7/8	1.3750	1-7/8	8	196095	160.26
1	std.	1.0000	1	1.5310	2	8-1/2	195798	203.31
1	1/64 o/s	1.0150	1	1.5470	2	8-1/2	195952	203.31
1	1/32 o/s	1.0310	1	1.5630	2	8-1/2	196106	203.31

HSS CAPSCREW COUNTERBORES

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS

Reamers



CONSTRUCTION REAMERS

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

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	SHANK DIA.	ITEM#	LIST PRICE
3/8	2-1/2	5	4-5/8	3/8	196876	69.77
7/16	3-1/4	5	5-3/8	7/16	196887	75.27
1/2	3-3/4	5	5-7/8	1/2	196898	83.32
9/16	3-3/4	5	5-7/8	1/2	196909	86.71
5/8	4-1/4	5	6-3/8	1/2	196920	96.47
11/16	4-1/4	5	6-3/8	1/2	196931	105.13
3/4	4-1/2	5	6-7/8	1/2	196942	121.74
13/16	4-1/2	5	6-7/8	1/2	196953	121.74
7/8	4-1/2	5	6-7/8	1/2	196964	138.12
15/16	4-1/2	5	6-7/8	1/2	196975	138.12
1	4-1/2	5	6-7/8	1/2	196986	157.69
1-1/16	4-1/2	5	6-7/8	1/2	197580	185.51



SAFETY REAMERS WITH MAGNETIC HEX SHANK

HIGH SPEED STEEL
LEFT HAND SPIRAL
RIGHT HAND CUT

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

See OSHA 29CFR Part 1926.759 (falling object protection)

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	HEX SHANK DIAMETER	ITEM#	LIST PRICE
9/16	4	5	5-1/2	1-1/16	198196	134.82
11/16	4-1/2	5	6-3/8	1-1/16	198207	163.06
13/16	5	5	7	1-1/4	198218	194.97
15/16	5	5	7	1-7/16	198229	220.30
1-1/16	5	5	7	1-5/8	198240	291.78
1-3/16	5	5	7	1-13/16	232956	375.88
1-5/16	5	5	7-7/8	2	232967	449.01



BRIDGE REAMERS

HIGH SPEED STEEL
LEFT HAND SPIRAL
RIGHT HAND CUT

SIZE	FLUTE LENGTH	# OF FLUTES	OVERALL LENGTH	MORSE TAPER #	ITEM#	LIST PRICE
7/16	5-1/8	5	9	2	198042	63.76
1/2	5-1/8	5	9	2	198053	70.99
9/16	5-1/8	5	9	2	196810	70.99
5/8	6-1/8	5	10	2	198064	76.65
11/16	7-1/8	5	11-3/4	3	196821	82.00
3/4	7-3/8	5	12	3	196832	106.75
13/16	7-3/8	5	12	3	196843	106.75
7/8	7-3/8	5	12	3	198075	117.03
15/16	7-3/8	5	12	3	196854	124.93
1	7-3/8	5	12	3	198086	135.78
1-1/16	7-3/8	5	12	3	196865	140.96
1-1/8	7-3/8	5	12	3	198097	171.99
1-3/16	7-3/8	5	12	3	198108	219.84
1-1/4	7-3/8	5	13	4	198119	250.16
1-5/16	7-3/8	5	13	4	198130	295.60
1-3/8	7-3/8	5	13	4	198141	306.90
1-7/16	7-3/8	6	13	4	198152	319.07
1-1/2	7-3/8	6	13	4	198163	362.25
1-9/16	7-3/8	6	13	4	198174	435.37
1-5/8	7-3/8	6	13	4	198185	501.97

HSS - CONSTRUCTION • SAFETY • BRIDGE REAMERS

CARBIDE ENDMILLS

CARBIDE MICRO ENDMILLS

CARBIDE THREADMILLS

CARBIDE DRILL MILLS

CARBIDE DRILLS

CARBIDE REAMERS

CARBIDE BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT DRILLS

HSS & COBALT ENDMILLS



Reamer Sets

HSS - CONSTRUCTION REAMER SETS

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
3Pc. • 1/2", 5/8", 3/4" 3 FLATS • Black & Gold	Left Hand	185876	369.53

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



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



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

HSS & COBALT - REAMER SETS

DESCRIPTION	FLUTE STYLE	ITEM#	LIST PRICE
29Pc • 1/16" - 1/2" by 64ths • HSS	Straight	185777	880.37
29Pc • 1/16" - 1/2" by 64ths • M42 Cobalt	Straight	185788	1,153.32
60Pc • #1 - #60 • HSS	Straight	185799	1,306.10
60Pc • #1 - #60 • M42 Cobalt	Straight	185810	1,418.05
26Pc • A-Z • HSS	Straight	185821	814.68
26Pc • A-Z • M42 Cobalt	Straight	185832	1,134.04
14Pc • Dowel Pin • .1230 - .4995 • HSS	Straight	185755	456.62
14Pc • Dowel Pin • .1230 - .4995 • M42 Cobalt	Straight	185766	598.97
14Pc • O/U • .1240 - .5010 • HSS	Straight	185843	456.62
14Pc • O/U • .1240 - .5010 • M42 Cobalt	Straight	185854	572.36
60Pc • #61 - #80 • HSS	Straight	185865	535.24
10Pc • #4 - 1/2" • Std • Ctr Bore Set • HSS	RH Spiral	185887	448.85
10Pc • #4 - 1/2" • 1/64" OS • Ctr Bore Set • HSS	RH Spiral	185898	448.85
10Pc • #4 - 1/2" • 1/32" OS • Ctr Bore Set • HSS	RH Spiral	185909	448.85

CARBIDE
ENDMILLS

CARBIDE
MICRO ENDMILLS

CARBIDE
THREADMILLS

CARBIDE
DRILL MILLS

CARBIDE
DRILLS

CARBIDE
REAMERS

CARBIDE
BURS

COUNTERSINKS

TAPS & DIES

HSS & COBALT
DRILLS

HSS & COBALT
ENDMILLS

HSS & COBALT REAMER SETS

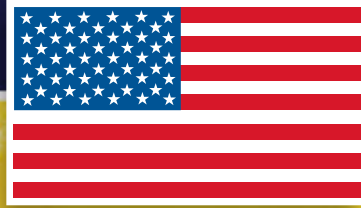
Decimal Equivalent Chart

DECIMAL EQUIVALENTS AND TAP SIZES OF FRACTION, WIRE, LETTER AND METRIC SIZES

DRILL SIZE	DECIMAL INCHES	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE	DRILL SIZE	DECIMAL INCHES	TAP SIZE
.97	.0059	58	.0420		27	.1440		H	.2660		17/32	.5312	5/8-11
.15mm	.0059	57	.0430		3.7mm	.1457		6.8mm	.2677		13.5mm	.5315	
96	.0063	1.1mm	.0433		26	.1470	3/16-24NS	6.9mm	.2717		35/64	.5469	
.16mm	.0063	1.15mm	.0453		3.75mm	.1476	m4.5x0.75	I	.2720	5/16-24NF	14mm	.5512	m16x2
95	.0067	56	.0465		25	.1495	#10-24	7mm	.2756	m8x1	9/16	.5625	
.17mm	.0067	3/64	.0469	#0-80	3.8mm	.1496		J	.2770		14.5mm	.5709	m16x1.5
94	.0071	1.2mm	.0472		24	.1520		7.1mm	.2795		37/64	.5781	3/8-18NPT 5/8-18NF
.18mm	.0071	1.25mm	.0492	m1.6x0.35	3.9mm	.1535		K	.2810		15mm	.5906	
93	.0075	1.3mm	.0512		23	.1540		9/32	.2812	5/16-32NS	19/32	.5938	3/8-18 NPS PIPE
.19mm	.0075	55	.0520		5/32	.1562		7.2mm	.2835		39/64	.6094	
92	.0079	1.35mm	.0531		22	.1570	3/16-32NS	7.25mm	.2854		15.5mm	.6102	m18x2.5
.2mm	.0079	54	.0550		4mm	.1575		7.3mm	.2874		5/8	.6250	11/16-16NS
91	.0083	1.4mm	.0551		21	.1590	#10-32	L	.2900		16mm	.6299	m18x2.0
.21mm	.0083	1.45mm	.0571	m1.8x0.35	20	.1610		7.4mm	.2913		41/64	.6406	
90	.0087	1.5mm	.0591		4.1mm	.1614		M	.2950		16.5mm	.6496	
.22mm	.0087	53	.0595	#1-64,72	4.2mm	.1654	m5x0.8	7.5mm	.2953		21/32	.6562	3/4-10NC
89	.0091	1.55mm	.0610		19	.1660		19/64	.2969		17mm	.6693	
.23mm	.0091	1/16	.0625		4.25mm	.1673		7.6mm	.2992		43/64	.6719	
.24mm	.0094	1.6mm	.0630	m2x0.4	4.3mm	.1693		N	.3020		11/16	.6875	3/4-16NF
88	.0095	52	.0635		18	.1695		7.7mm	.3031		17.5mm	.6890	m20x2.5
.25mm	.0098	1.65mm	.0650		11/64	.1719		7.75mm	.3051	m9x1.25	45/64	.7031	
87	.0100	1.7mm	.0669		17	.1730		7.8mm	.3071		18mm	.7087	m20x2.0
.26mm	.0102	51	.0670	#2-56	4.4mm	.1732		7.9mm	.3110		23/32	.7188	1/2-14NPT PIPE
86	.0105	1.75mm	.0689	m2.2x0.45	16	.1770	#12-24	5/16	.3125	3/8-16NC	18.5mm	.7283	m20x1.5
.27mm	.0106	50	.0700	#2-64	4.5mm	.1772		8mm	.3150		47/64	.7344	1/2-14NPS PIPE
85	.0110	1.8mm	.0709		15	.1800		O	.3160		19mm	.7480	
.28mm	.0110	1.85mm	.0728		4.6mm	.1811		8.1mm	.3189		3/4	.7500	
.29mm	.0114	49	.0730		14	.1820	#12-28	8.2mm	.3228		49/64	.7656	7/8-9NC
84	.0115	1.9mm	.0748	m2.3x0.4	13	.1850		P	.3230		19.5mm	.7677	m22x2.5
.3mm	.0118	48	.0760		4.7mm	.1850		8.25mm	.3248		25/32	.7812	
83	.0120	1.95mm	.0768		4.75mm	.1870		8.3mm	.3268		20mm	.7874	m22x2.0
82	.0125	5/64	.0781		3/16	.1875		21/64	.3281		51/64	.7969	
.32mm	.0126	47	.0785	#3-48	4.8mm	.1890		8.4mm	.3307		20.5mm	.8071	m22x1.5
81	.0130	2mm	.0787		12	.1890	7/32-32NS	Q	.3320	3/8-24NF	13/16	.8125	7/8-14NF
.34mm	.0134	2.05mm	.0807	m2.5x0.45	11	.1910		8.5mm	.3346	m10x1.5	21mm	.8268	m24x3
80	.0135	46	.0810		4.9mm	.1929		8.6mm	.3386		53/64	.8281	
.35mm	.0138	45	.0820	#3-56	10	.1935		R	.3390	1/8-27NPT PIPE	27/32	.8438	
.36mm	.0142	2.1mm	.0827		9	.1960		8.7mm	.3425		21.5mm	.8465	
79	.0145	2.15mm	.0846	m2.6x0.45	5mm	.1969	m6x1	11/32	.3438		55/64	.8594	
.38mm	.0150	44	.0860	#4-36	8	.1990		8.75mm	.3445	m10x1.25	22mm	.8661	m24x2
1/64	.0156	2.2mm	.0866		5.1mm	.2008		8.8mm	.3465		7/8	.8750	1-8NC
.4mm	.0157	2.25mm	.0886		7	.2010	1/4-20	S	.3480	1/8-27NPT PIPE	22.25mm	.8760	
78	.0160	43	.0890	#4-40	13/64	.2031		8.9mm	.3504		22.5mm	.8858	m24x1.50
.42mm	.0165	2.3mm	.0906		6	.2040		9mm	.3543	m10x1.00	57/64	.8906	
.44mm	.0173	2.35mm	.0925		5.2mm	.2047		T	.3580		23mm	.9055	
.45mm	.0177	42	.0935	#4-48	5	.2055		9.1mm	.3583		29/32	.9062	
77	.0180	3/32	.0938		5.25mm	.2067	m6x0.75	23/64	.3594		59/64	.9219	3/4-14NPT PIPE
.46mm	.0181	2.4mm	.0945		5.3mm	.2087		9.2mm	.3622		23.5mm	.9252	
.48mm	.0189	41	.0960		4	.2090	1/4-24	9.25mm	.3642		15/16	.9375	3/4-14 NPS 1-14 NF
.5mm	.0197	2.45mm	.0965		5.4mm	.2126		9.3mm	.3661		24mm	.9449	m27x3
76	.0200	40	.0980		3	.2130	1/4-28	U	.3680	7/16-14NC	61/64	.9531	
.75mm	.0210	2.5mm	.0984	m3x0.5	5.5mm	.2165		9.4mm	.3701		24.5mm	.9646	
74	.0225	38	.1015	#5-40	7/32	.2188		9.5mm	.3740	m11x1.50	31/32	.9688	
.6mm	.0236	2.6mm	.1024		2	.2210		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		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	1/16-27 NPT PIPE	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 ^{NPS} 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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