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**2016**  
**CATALOG**

# New & Expanded

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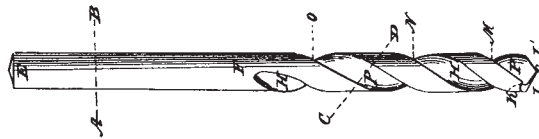


**United States Patent Office.**

STEPHEN A. MORSE, OF EAST BRIDGEWATER, MASSACHUSETTS.

IMPROVEMENT IN DRILL BITS.

Specification forming part of Letters Patent No. 38,119, dated April 7, 1863.



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# SHEARDRILL™

## High Performance Drills



List No. 5600 3xD Non-Coolant Through



List No. 5601 3xD Short Length Coolant Through



List No. 5602 5xD Long Length Coolant Through

### Premium Submicron Carbide

**TiALN – Titanium Aluminum Nitride Coating** increases wear resistance, heat resistance and chip flow and resists chip welding.

### 140° Self-Centering High Performance Point

**Coolant-Through** design delivers coolant directly to the drill point enabling higher speeds and chip loads.

**Recommended for** a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.

# SHEAR DRILL™

## 3xD Non-Coolant Through High Performance Drills

Premium Submicron Carbide

TiALN – Titanium Aluminum Nitride Coating increases wear resistance, heat resistance and chip flow and resists chip welding.

140° Self-Centering High Performance Point

Recommended for a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.

NON-COOLANT THROUGH DRILLS			
Drill and Shank Diameter Tolerances			
Diameter Range		Drill Dia.	Shank Dia.
INCH	.1181 - .2360	+0.000 / -.00071	-.0001 / -.0005
INCH	.2361 - .3940	+0.000 / -.00087	-.0001 / -.0005
INCH	.3941 - .7090	+0.000 / -.00106	-.0001 / -.0005

**Speeds & Feeds: Page 11**

**WITHOUT COOLANT HOLES  
Drilling up to 3xD**



List No. 5600 Non-Coolant Through

FRACTIONAL	SIZE			DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
	WIRE GAGE	LETTER	METRIC					
1/8				.1250	1/8	45/64	1-59/64	98700
9/64				.1406	9/64	25/32	2-3/64	98701
5/32				.1562	5/32	7/8	2-3/16	98702
11/64				.1719	11/64	15/16	2-9/32	98703
3/16				.1875	3/16	1	2-7/16	98704
13/64				.2031	13/64	1	2-7/16	98705
7/32				.2188	7/32	1-1/8	2-5/8	98706
15/64				.2344	15/64	1-1/8	2-5/8	98707
1/4				.2500	1/4	1-5/8	3-3/16	98708
		F		.2570	F	1-11/16	3-17/64	98709
17/64				.2656	17/64	1-11/16	3-17/64	98710
		I		.2720	I	1-11/16	3-17/64	98711
9/32				.2812	9/32	1-3/4	3-7/16	98712
19/64				.2969	19/64	1-7/8	3-9/16	98713
5/16				.3125	5/16	1-7/8	3-9/16	98714
21/64				.3281	21/64	2-1/16	3-3/4	98715
		Q		.3320	Q	2-1/16	3-3/4	98716
11/32				.3438	11/32	2-3/16	3-7/8	98717
23/64				.3594	23/64	2-9/32	4	98718
		U		.3680	U	2-9/32	4	98719
3/8				.3750	3/8	2-3/8	4-1/8	98720
25/64				.3906	25/64	2-3/8	4-1/8	98721
13/32				.4062	13/32	2-5/8	4-13/32	98722
27/64				.4219	27/64	2-11/16	4-1/2	98723
7/16				.4375	7/16	2-13/16	4-5/8	98724
29/64				.4531	29/64	2-7/8	4-3/4	98725
15/32				.4688	15/32	2-7/8	4-3/4	98726
31/64				.4844	31/64	3	5-5/16	98727
1/2				.5000	1/2	3-1/16	5-3/8	98728
33/64				.5156	33/64	3-11/32	5-11/16	98729
17/32				.5312	17/32	3-11/32	5-11/16	98730
9/16				.5625	9/16	3-1/2	5-15/16	98731
37/64				.5781	37/64	3-37/64	6	98732
5/8				.6250	5/8	3-25/32	6-19/64	98733

SHEAR DRILL™ High Performance Drills

# SHEARDRILL™

## Coolant-Through 3xD Short Length High Performance Drills

Premium Submicron Carbide

TiAlN – Titanium Aluminum Nitride Coating increases wear resistance, heat resistance and chip flow and resists chip welding.

140° Self-Centering High Performance Point

Coolant-Through design delivers coolant directly to the drill point enabling higher speeds and chip loads.

Recommended for a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.

COOLANT THROUGH DRILLS			
Drill and Shank Diameter Tolerances			
Diameter Range		Drill Dia. m7	Shank Dia. h6
INCH	.1182 - .2362	+0.0016 / +.00063	+0.000 / -.00031
METRIC (mm)	> 3.0 - 6.0	+0.004 / +0.016	+0.000 / -.008
INCH	.2363 - .3937	+0.00024 / +.00083	+0.000 / -.00035
METRIC (mm)	> 6.0 - 10.0	+0.006 / +0.021	+0.000 / -.009
INCH	.3938 - .7087	+0.00027 / +.00098	+0.000 / -.00043
METRIC (mm)	> 10.0 - 18.0	+0.007 / +.025	+0.000 / -.011
INCH	.7088 - .7874	+0.00031 / +0.00114	+0.000 / -.00051
METRIC (mm)	> 18.0 - 20.0	+0.008 / +0.029	+0.000 / -.013

Speeds & Feeds: Page 11



List No. 5601 Short Length Coolant Through

COOLANT-THROUGH

FRACTIONAL	SIZE			DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
	WIRE GAGE	LETTER	METRIC					
5/32	21		4.0	.1562	6	24	66	98734
				.1575	6	24	66	98735
				.1590	6	24	66	98736
				.1654	6	24	66	98737
				.1772	6	24	66	98738
3/16	3		4.8	.1875	6	24	66	98739
				.1890	6	28	66	98740
				.1969	6	28	66	98741
				.2130	6	28	66	98742
				.2165	6	28	66	98743
7/32	2		5.8	.2188	6	28	66	98744
				.2210	6	28	66	98745
		A		.2283	6	28	66	98746
				.2340	6	28	66	98747
				.2362	6	28	66	98748
		C		.2420	8	34	79	98749
				.2500	8	34	79	98750
1/4			6.5	.2559	8	34	79	98751
				.2570	8	34	79	98752
		F		.2660	8	34	79	98753
				.2677	8	34	79	98754
		I		.2720	8	34	79	98755
				.2756	8	34	79	98756
				.2770	8	34	79	98757
9/32			7.5	.2812	8	41	79	98758
				.2953	8	41	79	98759
				.2969	8	41	79	98760
19/64			8.0	.3125	8	41	79	98761
				.3150	8	41	79	98762
				.3228	10	47	89	98763

(continued)



# SHEAR DRILL™

## Coolant-Through 3xD Short Length High Performance Drills

Premium Submicron Carbide

TiALN – Titanium Aluminum Nitride Coating increases wear resistance, heat resistance and chip flow and resists chip welding.

140° Self-Centering High Performance Point

Coolant-Through design delivers coolant directly to the drill point enabling higher speeds and chip loads.

Recommended for a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.

To achieve  
Optimal Results  
all Components of the  
Drilling System  
must be considered

Technical Information:  
See Page 10

Recommended  
Speeds & Feeds:  
See Page 11

Speeds & Feeds: Page 11



(continued)

List No. 5601 Short Length Coolant Through

COOLANT-THROUGH

FRACTIONAL	SIZE		METRIC	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
	WIRE GAGE	LETTER						
21/64		Q		.3281	10	47	89	98764
				.3320	10	47	89	98765
			8.5	.3346	10	47	89	98766
			9.0	.3543	10	47	89	98767
				.3594	10	47	89	98768
23/64		U		.3680	10	47	89	98769
			9.5	.3740	10	47	89	98770
3/8				.3750	10	47	89	98771
25/64				.3906	10	47	89	98772
			10.0	.3937	10	47	89	98773
13/32				.4062	12	55	102	98774
			10.5	.4134	12	55	102	98775
27/64				.4219	12	55	102	98776
			11.0	.4331	12	55	102	98777
7/16				.4375	12	55	102	98778
			11.5	.4528	12	55	102	98779
15/32				.4688	12	55	102	98780
			12.0	.4724	12	55	102	98781
			12.5	.4921	14	60	107	98782
1/2				.5000	14	60	107	98783
			13.0	.5118	14	60	107	98784
			13.5	.5315	14	60	107	98785
			14.0	.5512	14	60	107	98786
9/16				.5625	16	65	115	98787
			14.5	.5709	16	65	115	98788
			15.0	.5906	16	65	115	98789
5/8				.6250	16	65	115	98790
			16.0	.6299	16	65	115	98791
3/4				.7500	20	79	131	98792

SHEAR DRILL™ High Performance Drills

# SHEAR DRILL™

## Coolant-Through 5xD Long Length High Performance Drills

Premium Submicron Carbide

TiAlN – Titanium Aluminum Nitride Coating increases wear resistance, heat resistance and chip flow and resists chip welding.

140° Self-Centering High Performance Point

Coolant-Through design delivers coolant directly to the drill point enabling higher speeds and chip loads.

Recommended for a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.



List No. 5602 Long Length Coolant Through

COOLANT-THROUGH

COOLANT THROUGH DRILLS			
Drill and Shank Diameter Tolerances			
Diameter Range		Drill Dia. m7	Shank Dia. h6
INCH	.1182 - .2362	+0.0016 / +.00063	+0.000 / -.00031
METRIC (mm)	> 3.0 - 6.0	+0.004 / +0.016	+0.000 / -.008
INCH	.2363 - .3937	+0.0024 / +0.00083	+0.000 / -.00035
METRIC (mm)	> 6.0 - 10.0	+0.006 / +0.021	+0.000 / -.009
INCH	.3938 - .7087	+0.0027 / +.00098	+0.000 / -.00043
METRIC (mm)	> 10.0 - 18.0	+0.007 / +.025	+0.000 / -.011
INCH	.7088 - .7874	+0.0031 / +0.0114	+0.000 / -.00051
METRIC (mm)	> 18.0 - 20.0	+0.008 / +0.029	+0.000 / -.013

FRACTIONAL	SIZE			DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
	WIRE GAGE	LETTER	METRIC					
5/32	21		4.0	.1562	6	36	74	98793
				.1575	6	36	74	98794
				.1590	6	36	74	98795
				.1654	6	36	74	98796
				.1772	6	36	74	98797
3/16	3		4.8	.1875	6	36	74	98798
				.1890	6	44	82	98799
				.1969	6	44	82	98800
				.2130	6	44	82	98801
				.2165	6	44	82	98802
7/32	2		5.8	.2188	6	44	82	98803
				.2210	6	44	82	98804
		A		.2283	6	44	82	98805
				.2340	6	44	82	98806
		C		.2420	8	53	91	98808
				.2500	8	53	91	98809
1/4		F	6.5	.2559	8	53	91	98810
		H		.2570	8	53	91	98811
				.2660	8	53	91	98812
		I	6.8	.2677	8	53	91	98813
				.2720	8	53	91	98814
		J	7.0	.2756	8	53	91	98815
9/32				.2770	8	53	91	98816
				.2812	8	53	91	98817
19/64			7.5	.2953	8	53	91	98818
				.2969	8	53	91	98819
5/16				.3125	8	53	91	98820
			8.0	.3150	8	53	91	98821
			8.2	.3228	10	61	103	98822

(continued)

# SHEARDRILL™

## Coolant-Through 5xD Long Length High Performance Drills

Premium Submicron Carbide

TiALN – Titanium Aluminum Nitride Coating increases wear resistance, heat resistance and chip flow and resists chip welding.

140° Self-Centering High Performance Point

Coolant-Through design delivers coolant directly to the drill point enabling higher speeds and chip loads.

Recommended for a wide range of materials including carbon steels, cast steels, alloy steels, stainless steels and cast iron.



(continued)

List No. 5602 Long Length Coolant Through

COOLANT-THROUGH

FRACTIONAL	SIZE		METRIC	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
	WIRE GAGE	LETTER						
21/64		Q		.3281	10	61	103	98823
				.3320	10	61	103	98824
			8.5	.3346	10	61	103	98825
			9.0	.3543	10	61	103	98826
				.3594	10	61	103	98827
23/64		U		.3680	10	61	103	98828
			9.5	.3740	10	61	103	98829
			10.0	.3937	10	61	103	98831
3/8				.3750	10	61	103	98830
13/32				.4062	12	71	118	98832
			10.5	.4134	12	71	118	98833
27/64				.4219	12	71	118	98834
			11.0	.4331	12	71	118	98835
7/16				.4375	12	71	118	98836
			11.5	.4528	12	71	118	98837
15/32				.4688	12	71	118	98838
			12.0	.4724	12	71	118	98839
			12.5	.4921	14	77	124	98840
			13.0	.5118	14	77	124	98842
1/2				.5315	14	77	124	98843
			14.0	.5512	14	77	124	98844
			14.5	.5625	16	83	133	98845
9/16				.5709	16	83	133	98846
			15.0	.5906	16	83	133	98847
5/8				.6250	16	83	133	98848
			16.0	.6299	16	83	133	98849
3/4				.7500	20	101	153	98850

To achieve  
Optimal Results  
all Components of the  
Drilling System  
must be considered

Technical Information:  
See Page 10

Recommended  
Speeds & Feeds:  
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Speeds & Feeds: Page 11

SHEARDRILL™ High Performance Drills

# SHEARDRILL™

## Technical Information

All components of the drilling system contribute to the achievement of the quality of the hole produced and the productivity that can be realized. In order to maximize success the following should be considered.

1. Toolholding – High quality tool holders should be used. Total indicated tool run out measured at the point should be less than .001”.
2. Machine – A rigid machine with a high quality spindle is required.
3. Workholding – The workpiece must be held rigidly so that it cannot deflect or vibrate during drilling
4. Drilling and Chamfering – A chamfer should be added to a hole only after drilling, never before.
5. The drill should be perpendicular to the surface being drilled. An inclined or rough surface should be pre-machined with an end mill to make it perpendicular before drilling.
6. Drilling On Turning Machines – When drilling on a turning machine the drill must be on center. The tolerance range for centrality should not exceed  $\pm .001$ . When drilling more than 3XD the drill may require a reduction in speed.
7. Coolant – **SHEARDRILL™** drills are high penetration drills. To perform to their potential they must be properly cooled. A high pressure and high volume with a quality high lubricity coolant will aid chip removal, enhance tool life and, increase hole quality.
  - Without adequate coolant, drills can heat up quickly and expand, sometimes leading to the drill seizing in the hole.
  - Heat at the drill point can cause coolant to vaporize resulting in thermal damage to the point. Coolant pressure should be high enough to break this barrier keeping the point within acceptable operating parameters.
  - See Minimum Favorable Coolant Pressure chart below for coolant-through drills



# SHEAR DRILL™

## Speeds and Feeds

Material Group	Examples	Composition / Structure	Hardness BRN	Cutting Speed (SFM)	D = 0.125"	D = 0.250"	D = 0.375"	D = 0.500"	D = 0.625"	D = 0.750"
Unalloyed steel, cast steel, machining steel	1008, 1108, 1018, 10L18, 12L15, ASTM A426: Gr. CP1	C = 0.10 - 0.25 Annealed, Long Chipping	125	390	0.004"	0.005"	0.006"	0.008"	0.009"	0.012"
		C = 0.10 - 0.25 Annealed, Short Chipping	125	410	0.004"	0.005"	0.006"	0.009"	0.011"	0.013"
	1030, 1055, 1070, 1524, 1050, 1060, ASTM 352 Gr. LCA, ASTM 356 Gr. 1, 1536	C = 0.25 - 0.55 Annealed, Long Chipping	190	360	0.004"	0.005"	0.006"	0.009"	0.011"	0.013"
		C = 0.25 - 0.55 Annealed, Short Chipping	190	390	0.004"	0.006"	0.007"	0.009"	0.011"	0.014"
		C = 0.25 - 0.55 Tempered	250	300	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
		C = 0.25 - 0.80 Annealed	270	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
		C = 0.25 - 0.80 Tempered	300	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.015"
Low-alloy steel, cast steel, machining steel	1330, 2515, 3140, 4130, 4140, 4320, 4340, 5140, 8620, 9315, 9840	Annealed	180	260	0.004"	0.006"	0.007"	0.009"	0.012"	0.015"
		Tempered	275	260	0.004"	0.006"	0.007"	0.009"	0.011"	0.014"
		Tempered	300	260	0.004"	0.005"	0.006"	0.008"	0.010"	0.013"
		Tempered	350	230	0.004"	0.006"	0.007"	0.009"	0.011"	0.013"
High-alloy steel, cast steel, high alloy tool steel	D2, M2, T15	Annealed	200	200	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
		Hardened and Tempered	325	160	0.002"	0.004"	0.004"	0.006"	0.008"	0.010"
Gray cast iron	ASTM A48 Cl. 25, ASE J431c: Gr.G3000, ASTM A48 Cl. 30	Pearlitic / Ferritic	180	540	0.006"	0.007"	0.009"	0.012"	0.014"	0.018"
		Pearlitic (Martensitic)	260	360	0.005"	0.006"	0.008"	0.010"	0.013"	0.016"
Ductile cast iron	ASTM A536 Gr. 60-40-18, SAE J434c: Gr.D5506	Ferritic	160	360	0.005"	0.006"	0.008"	0.010"	0.012"	0.015"
		Pearlitic	250	360	0.004"	0.005"	0.006"	0.007"	0.009"	0.012"
Malleable cast iron	ASTM A47 Gr.32510, SAE J158 Gr. M4504, M5003	Ferritic	130	430	0.005"	0.006"	0.007"	0.009"	0.012"	0.015"
		Pearlitic	230	430	0.004"	0.005"	0.006"	0.008"	0.010"	0.012"
Austenitic Stainless Steels	202, 303, 304, 316, 316L	Easy to Moderate Machining	200	180	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
Ferritic, Martensitic, and PH stainless steels	405, 410, 440C, 502, AM350, 17-4PH	Annealed	200	180	0.003"	0.004"	0.005"	0.006"	0.008"	0.010"
		Hardened and Tempered	325	160	0.002"	0.004"	0.004"	0.006"	0.008"	0.010"

### SPEED AND FEED RATES FOR NON-COOLANT-THROUGH DRILLS SHOULD EACH BE REDUCED BY 20%

Better drilling productivity is obtained by knowing the properties of the workpiece material. The hardness, chip forming characteristics, and machining characteristics help to select optimal machining parameters. Contact Morse Cutting Tools for more information.

SPEEDS and FEEDS are suggested starting points and may be increased or decreased depending upon material and machining conditions. Start conservatively and increase until machining cycle is optimized.

# HPC COBALT HIGH PERFORMANCE WIDE LAND PARABOLIC FLUTE DRILLS



**130° Self-Centering Point • 38° Helix Angle**  
**Special Web Thinning • Heavy-Duty Web**

**AVAILABLE IN:**      **M35** Cobalt High Speed Steel  
                                 **TiN** — Titanium Nitride Coated  
                                 **TiALN** — Titanium Aluminum Nitride Coated

## **PARABOLIC FLUTE DRILLS**

Feature a unique flute design that greatly enhances chip flow, coolant flow to the drill point and heat dissipation. Recommended for Deep Hole Drilling greater than three diameters deep without the need to reduce feed rate or withdraw the drill to clear chips (a constant heavy feed rate is recommended).

## **WIDE LAND PARABOLIC FLUTE DRILLS**

The next generation in parabolic flute design, are effective in a wider range of materials and applications than standard parabolic flute drills. An Enhanced Flute Design with reinforced web provides increased drill strength and rigidity, straighter closer tolerance holes, improved chip formation and evacuation, improved coolant flow to the drill point and higher speeds and feeds for increased productivity.

## **PREMIUM M35 COBALT STEEL**

Offers increased hardness, toughness, wear resistance and heat resistance. Highly recommended for drilling tough, high tensile strength materials up to 35 Rc hardness and materials that generate higher cutting temperatures. Applications include high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

## **TiN — TITANIUM NITRIDE COATING**

An excellent all around coating, offers increased hardness and wear resistance, improved heat resistance, high lubricity, reduced edge build-up, improved surface finish and higher speeds and feeds. Increase productivity and tool life.

## **TiALN — TITANIUM ALUMINUM NITRIDE COATING**

Is especially recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials which generate higher cutting temperatures. TiALN actually forms a hard aluminum oxide layer in hot dry machining applications which reflects heat back into the chip and away from the tool while allowing higher speeds and feeds. High productivity with increased tool life.

# Screw Machine Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

Broca de alto rendimiento



List No. 1360 Bright Finish

List No. 1360G TiN — Titanium Nitride Coated

List No. 1360T TiALN — Titanium Aluminum Nitride Coated

Short flute length and short overall length for maximum rigidity

Speeds & Feeds: Page 25

Fract.	Size			Dec. Equiv.	Flute Length MM	OAL MM	List No. 1360	List No. 1360G	List No. 1360T
	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
5/64	—	—	—	0.0780	12	38	12185	91500	60000
—	47	—	—	0.0783	12	38	12186	91501	60001
—	—	—	2.00	0.0787	12	38	12187	91502	60002
—	46	—	—	0.0810	12	38	12188	91503	60003
—	45	—	—	0.0820	12	38	12189	91504	60004
—	—	—	2.10	0.0827	12	38	12190	91505	60005
—	44	—	—	0.0860	13	40	12191	91506	60006
—	—	—	2.20	0.0866	13	40	12192	91507	60007
—	43	—	—	0.0890	13	40	12193	91508	60008
—	—	—	2.30	0.0906	13	40	12194	91509	60009
—	42	—	—	0.0935	14	43	12195	91510	60010
3/32	—	—	—	0.0938	14	43	12196	91511	60011
—	—	—	2.40	0.0945	14	43	12197	91512	60012
—	41	—	—	0.0960	14	43	12198	91513	60013
—	40	—	—	0.0980	14	43	12199	91514	60014
—	—	—	2.50	0.0984	14	43	12200	91515	60015
—	39	—	—	0.0995	14	43	12201	91516	60016
—	38	—	—	0.1015	14	43	12202	91517	60017
—	—	—	2.60	0.1024	14	43	12203	91518	60018
—	37	—	—	0.1040	14	43	12204	91519	60019
—	—	—	2.70	0.1063	16	46	12205	91520	60020
—	36	—	—	0.1067	16	46	12206	91521	60021
7/64	—	—	—	0.1094	16	46	12207	91522	60022
—	35	—	—	0.1100	16	46	12208	91523	60023
—	—	—	2.80	0.1102	16	46	12209	91524	60024
—	34	—	—	0.1110	16	46	12210	91525	60025
—	33	—	—	0.1130	16	46	12211	91526	60026
—	—	—	2.90	0.1142	16	46	12212	91527	60027
—	32	—	—	0.1160	16	46	12213	91528	60028
—	—	—	3.00	0.1181	16	46	12214	91529	60029
—	31	—	—	0.1200	18	49	12215	91530	60030
—	—	—	3.10	0.1220	18	49	12216	91531	60031
1/8	—	—	—	0.1250	18	49	12217	91532	60032
—	—	—	3.20	0.1260	18	49	12218	91533	60033
—	30	—	—	0.1285	18	49	12219	91534	60034
—	—	—	3.30	0.1299	18	49	12220	91535	60035
—	—	—	3.40	0.1339	20	52	12221	91536	60036
—	29	—	—	0.1360	20	52	12222	91537	60037
—	—	—	3.50	0.1378	20	52	12223	91538	60038
9/64	—	—	—	0.1406	20	52	12224	91539	60039
—	28	—	—	0.1405	20	52	12225	91540	60040
—	—	—	3.60	0.1417	20	52	12226	91541	60041
—	27	—	—	0.1440	20	52	12227	91542	60042
—	—	—	3.70	0.1457	20	52	12228	91543	60043
—	26	—	—	0.1470	20	52	12229	91544	60044
—	25	—	—	0.1495	22	55	12230	91545	60045

HPC High Performance Drills

# Screw Machine Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

Broca de alto rendimiento



List No. 1360 Bright Finish

List No. 1360G TiN — Titanium Nitride Coated

List No. 1360T TiALN — Titanium Aluminum Nitride Coated

Short flute length and short overall length for maximum rigidity

HPC High Performance Drills

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1360	List No. 1360G	List No. 1360T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
—	24	—	—	0.1520	22	55	12231	91546	60046
—	—	—	3.90	0.1535	22	55	12232	91547	60047
—	23	—	—	0.1540	22	55	12233	91548	60048
5/32	—	—	—	0.1562	22	55	12234	91549	60049
—	22	—	—	0.1570	22	55	12235	91550	60050
—	—	—	4.00	0.1575	22	55	12236	91551	60051
—	21	—	—	0.1590	22	55	12237	91552	60052
—	20	—	—	0.1610	22	55	12238	91553	60053
—	—	—	4.10	0.1614	22	55	12239	91554	60054
—	—	—	4.20	0.1654	22	55	12240	91555	60055
—	19	—	—	0.1660	22	55	12241	91556	60056
—	—	—	4.30	0.1693	24	58	12242	91557	60057
—	18	—	—	0.1695	24	58	12243	91558	60058
11/64	—	—	—	0.1719	24	58	12244	91559	60059
—	17	—	—	0.1730	24	58	12245	91560	60060
—	—	—	4.40	0.1732	24	58	12246	91561	60061
—	16	—	—	0.1770	24	58	12247	91562	60062
—	—	—	4.50	0.1772	24	58	12248	91563	60063
—	15	—	—	0.1800	24	58	12249	91564	60064
—	—	—	4.60	0.1811	24	58	12250	91565	60065
—	14	—	—	0.1820	24	58	12251	91566	60066
—	13	—	—	0.1850	24	58	12252	91567	60067
—	—	—	4.70	0.1850	24	58	12253	91568	60068
3/16	—	—	—	0.1875	26	62	12254	91569	60069
—	—	—	4.80	0.1890	26	62	12255	91570	60070
—	12	—	—	0.1890	26	62	12256	91571	60071
—	11	—	—	0.1910	26	62	12257	91572	60072
—	—	—	4.90	0.1929	26	62	12258	91573	60073
—	10	—	—	0.1935	26	62	12259	91574	60074
—	9	—	—	0.1960	26	62	12260	91575	60075
—	—	—	5.00	0.1969	26	62	12261	91576	60076
—	8	—	—	0.1990	26	62	12262	91577	60077
—	—	—	5.10	0.2008	26	62	12263	91578	60078
—	7	—	—	0.2010	26	62	12264	91579	60079
13/64	—	—	—	0.2031	26	62	12265	91580	60080
—	6	—	—	0.2040	26	62	12266	91581	60081
—	—	—	5.20	0.2047	26	62	12267	91582	60082
—	5	—	—	0.2055	26	62	12268	91583	60083
—	—	—	5.30	0.2087	26	62	12269	91584	60084
—	4	—	—	0.2090	28	66	12270	91585	60085
—	—	—	5.40	0.2126	28	66	12271	91586	60086
—	3	—	—	0.2130	28	66	12272	91587	60087
—	—	—	5.50	0.2165	28	66	12273	91588	60088
7/32	—	—	—	0.2188	28	66	12274	91589	60089
—	—	—	5.60	0.2205	28	66	12275	91590	60090
—	2	—	—	0.2210	28	66	12276	91591	60091



# Screw Machine Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

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List No. 1360 Bright Finish

List No. 1360G TiN — Titanium Nitride Coated

List No. 1360T TiAlN — Titanium Aluminum Nitride Coated

Short flute length and short overall length for maximum rigidity

**Speeds & Feeds: Page 25**

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1360	List No. 1360G	List No. 1360T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiAlN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	5.70	0.2244	28	66	12277	91592	60092
—	1	—	—	0.2280	28	66	12278	91593	60093
—	—	—	5.80	0.2283	28	66	12279	91594	60094
—	—	—	5.90	0.2323	28	66	12280	91595	60095
15/64	—	—	—	0.2344	28	66	12281	91596	60096
—	—	—	6.00	0.2362	28	66	12282	91597	60097
—	—	—	6.10	0.2402	31	70	12283	91598	60098
—	—	—	6.20	0.2441	31	70	12284	91599	60099
—	—	—	6.30	0.2480	31	70	12285	91600	60100
1/4	—	—	—	0.2500	31	70	12286	91601	60101
—	—	—	6.40	0.2520	31	70	12287	91602	60102
—	—	—	6.50	0.2559	31	70	12288	91603	60103
—	—	—	6.60	0.2598	31	70	12289	91604	60104
—	—	—	6.70	0.2638	31	70	12290	91605	60105
17/64	—	—	—	0.2656	34	74	12291	91606	60106
—	—	—	6.80	0.2677	34	74	12292	91607	60107
—	—	—	6.90	0.2717	34	74	12293	91608	60108
—	—	—	7.00	0.2756	34	74	12294	91609	60109
—	—	—	7.10	0.2795	34	74	12295	91610	60110
9/32	—	—	—	0.2812	34	74	12296	91611	60111
—	—	—	7.20	0.2835	34	74	12297	91612	60112
—	—	—	7.30	0.2874	34	74	12298	91613	60113
—	—	—	7.40	0.2913	34	74	12299	91614	60114
—	—	—	7.50	0.2953	34	74	12300	91615	60115
19/64	—	—	—	0.2969	37	79	12301	91616	60116
—	—	—	7.60	0.2992	37	79	12302	91617	60117
—	—	—	7.70	0.3031	37	79	12303	91618	60118
—	—	—	7.80	0.3071	37	79	12304	91619	60119
—	—	—	7.90	0.3110	37	79	12305	91620	60120
5/16	—	—	—	0.3125	37	79	12306	91621	60121
—	—	—	8.00	0.3150	37	79	12307	91622	60122
—	—	—	8.10	0.3189	37	79	12308	91623	60123
—	—	—	8.20	0.3228	37	79	12309	91624	60124
—	—	—	8.30	0.3268	37	79	12310	91625	60125
21/64	—	—	—	0.3281	37	79	12311	91626	60126
—	—	—	8.40	0.3307	37	79	12312	91627	60127
—	—	—	8.50	0.3346	37	79	12313	91628	60128
—	—	—	8.60	0.3386	40	84	12314	91629	60129
—	—	—	8.70	0.3425	40	84	12315	91630	60130
11/32	—	—	—	0.3438	40	84	12316	91631	60131
—	—	—	8.80	0.3465	40	84	12317	91632	60132
—	—	—	8.90	0.3504	40	84	12318	91633	60133
—	—	—	9.00	0.3543	40	84	12319	91634	60134
—	—	—	9.10	0.3583	40	84	12320	91635	60135
23/64	—	—	—	0.3594	40	84	12321	91636	60136
—	—	—	9.20	0.3622	40	84	12322	91637	60137

HPC High Performance Drills

# Screw Machine Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Short flute length and short overall length for maximum rigidity

Foret à haut rendement

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List No. 1360 Bright Finish

List No. 1360G TiN — Titanium Nitride Coated

List No. 1360T TiALN — Titanium Aluminum Nitride Coated

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1360	List No. 1360G	List No. 1360T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	9.30	0.3661	40	84	12323	91638	60138
—	—	—	9.40	0.3701	40	84	12324	91639	60139
—	—	—	9.50	0.3740	40	84	12325	91640	60140
3/8	—	—	—	0.3750	43	89	12326	91641	60141
—	—	—	9.60	0.3780	43	89	12327	91642	60142
—	—	—	9.70	0.3819	43	89	12328	91643	60143
—	—	—	9.80	0.3858	43	89	12329	91644	60144
—	—	—	9.90	0.3898	43	89	12330	91645	60145
25/64	—	—	—	0.3906	43	89	12331	91646	60146
—	—	—	10.00	0.3937	43	89	12332	91647	60147
13/32	—	—	—	0.4062	43	89	12333	91648	60148
27/64	—	—	—	0.4219	47	95	12334	91649	60149
7/16	—	—	—	0.4375	47	95	12335	91650	60150
29/64	—	—	—	0.4531	47	95	12336	91651	60151
15/32	—	—	—	0.4688	51	102	12337	91652	60152
31/64	—	—	—	0.4844	51	102	12338	91653	60153
1/2	—	—	—	0.5000	51	102	12339	91654	60154

## PREMIUM M35 COBALT STEEL

Offers increased hardness, toughness, wear resistance and heat resistance. Highly recommended for drilling tough, high tensile strength materials up to 35 Rc hardness and materials that generate higher cutting temperatures. Applications include high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

## TiN — TITANIUM NITRIDE COATING

An excellent all around coating, offers increased hardness and wear resistance, improved heat resistance, high lubricity, reduced edge build-up, improved surface finish and higher speeds and feeds. Increase productivity and tool life.

## TiALN — TITANIUM ALUMINUM NITRIDE COATING

Is especially recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials which generate higher cutting temperatures. TiALN actually forms a hard aluminum oxide layer in hot dry machining applications which reflects heat back into the chip and away from the tool while allowing higher speeds and feeds. High productivity with increased tool life.

# Jobber Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

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List No. 1361 Bright Finish

List No. 1361G TiN — Titanium Nitride Coated

List No. 1361T TiALN — Titanium Aluminum Nitride Coated

Select the shortest drill possible for your application for maximum rigidity, hole accuracy and economy.

**Speeds & Feeds: Page 25**

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1361	List No. 1361G	List No. 1361T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
5/64	—	—	—	0.0780	24	49	12350	91660	60160
—	47	—	—	0.0783	24	49	12351	91661	60161
—	—	—	2.00	0.0787	24	49	12352	91662	60162
—	46	—	—	0.0810	24	49	12353	91663	60163
—	45	—	—	0.0820	24	49	12354	91664	60164
—	—	—	2.10	0.0827	24	49	12355	91665	60165
—	44	—	—	0.0860	27	53	12356	91666	60166
—	—	—	2.20	0.0866	27	53	12357	91667	60167
—	43	—	—	0.0890	27	53	12358	91668	60168
—	—	—	2.30	0.0906	27	53	12359	91669	60169
—	42	—	—	0.0935	30	57	12360	91670	60170
3/32	—	—	—	0.0938	30	57	12361	91671	60171
—	—	—	2.40	0.0945	30	57	12362	91672	60172
—	41	—	—	0.0960	30	57	12363	91673	60173
—	40	—	—	0.0980	30	57	12364	91674	60174
—	—	—	2.50	0.0984	30	57	12365	91675	60175
—	39	—	—	0.0995	30	57	12366	91676	60176
—	38	—	—	0.1015	30	57	12367	91677	60177
—	—	—	2.60	0.1024	30	57	12368	91678	60178
—	37	—	—	0.1040	30	57	12369	91679	60179
—	—	—	2.70	0.1063	33	61	12370	91680	60180
—	36	—	—	0.1067	33	61	12371	91681	60181
7/64	—	—	—	0.1094	33	61	12372	91682	60182
—	35	—	—	0.1100	33	61	12373	91683	60183
—	—	—	2.80	0.1102	33	61	12374	91684	60184
—	34	—	—	0.1110	33	61	12375	91685	60185
—	33	—	—	0.1130	33	61	12376	91686	60186
—	—	—	2.90	0.1142	33	61	12377	91687	60187
—	32	—	—	0.1160	33	61	12378	91688	60188
—	—	—	3.00	0.1181	33	61	12379	91689	60189
—	31	—	—	0.1200	36	65	12380	91690	60190
—	—	—	3.10	0.1220	36	65	12381	91691	60191
1/8	—	—	—	0.1250	36	65	12382	91692	60192
—	—	—	3.20	0.1260	36	65	12383	91693	60193
—	30	—	—	0.1285	36	65	12384	91694	60194
—	—	—	3.30	0.1299	36	65	12385	91695	60195
—	—	—	3.40	0.1339	39	70	12386	91696	60196
—	29	—	—	0.1360	39	70	12387	91697	60197
—	—	—	3.50	0.1378	39	70	12388	91698	60198
9/64	—	—	—	0.1406	39	70	12389	91699	60199
—	28	—	—	0.1405	39	70	12390	91700	60200
—	—	—	3.60	0.1417	39	70	12391	91701	60201
—	27	—	—	0.1440	39	70	12392	91702	60202
—	—	—	3.70	0.1457	39	70	12393	91703	60203
—	26	—	—	0.1470	39	70	12394	91704	60204
—	25	—	—	0.1495	43	75	12395	91705	60205
—	24	—	—	0.1520	43	75	12396	91706	60206
—	—	—	3.90	0.1535	43	75	12397	91707	60207
—	23	—	—	0.1540	43	75	12398	91708	60208
5/32	—	—	—	0.1562	43	75	12399	91709	60209

HPC High Performance Drills

# Jobber Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

Broca de alto rendimiento



List No. 1361 Bright Finish

List No. 1361G TiN — Titanium Nitride Coated

List No. 1361T TiAlN — Titanium Aluminum Nitride Coated

Select the shortest drill possible for your application for maximum rigidity, hole accuracy and economy.

Fract.	Size			Dec. Equiv.	Flute Length MM	OAL MM	List No. 1361	List No. 1361G	List No. 1361T
	Wire	Letter	Metric				Bright Finish	TiN Coated	TiAlN Coated
							EDP No.	EDP No.	EDP No.
—	22	—	—	0.1570	43	75	12400	91710	60210
—	—	—	4.00	0.1575	43	75	12401	91711	60211
—	21	—	—	0.1590	43	75	12402	91712	60212
—	20	—	—	0.1610	43	75	12403	91713	60213
—	—	—	4.10	0.1614	43	75	12404	91714	60214
—	—	—	4.20	0.1654	43	75	12405	91715	60215
—	19	—	—	0.1660	43	75	12406	91716	60216
—	—	—	4.30	0.1693	47	80	12407	91717	60217
—	18	—	—	0.1695	47	80	12408	91718	60218
11/64	—	—	—	0.1719	47	80	12409	91719	60219
—	17	—	—	0.1730	47	80	12410	91720	60220
—	—	—	4.40	0.1732	47	80	12411	91721	60221
—	16	—	—	0.1770	47	80	12412	91722	60222
—	—	—	4.50	0.1772	47	80	12413	91723	60223
—	15	—	—	0.1800	47	80	12414	91724	60224
—	—	—	4.60	0.1811	47	80	12415	91725	60225
—	14	—	—	0.1820	47	80	12416	91726	60226
—	13	—	—	0.1850	47	80	12417	91727	60227
—	—	—	4.70	0.1850	47	80	12418	91728	60228
3/16	—	—	—	0.1875	52	86	12419	91729	60229
—	—	—	4.80	0.1890	52	86	12420	91730	60230
—	12	—	—	0.1890	52	86	12421	91731	60231
—	11	—	—	0.1910	52	86	12422	91732	60232
—	—	—	4.90	0.1929	52	86	12423	91733	60233
—	10	—	—	0.1935	52	86	12424	91734	60234
—	9	—	—	0.1960	52	86	12425	91735	60235
—	—	—	5.00	0.1969	52	86	12426	91736	60236
—	8	—	—	0.1990	52	86	12427	91737	60237
—	—	—	5.10	0.2008	52	86	12428	91738	60238
—	7	—	—	0.2010	52	86	12429	91739	60239
13/64	—	—	—	0.2031	52	86	12430	91740	60240
—	6	—	—	0.2040	52	86	12431	91741	60241
—	—	—	5.20	0.2047	52	86	12432	91742	60242
—	5	—	—	0.2055	52	86	12433	91743	60243
—	—	—	5.30	0.2087	52	86	12434	91744	60244
—	4	—	—	0.2090	57	93	12435	91745	60245
—	—	—	5.40	0.2126	57	93	12436	91746	60246
—	3	—	—	0.2130	57	93	12437	91747	60247
—	—	—	5.50	0.2165	57	93	12438	91748	60248
7/32	—	—	—	0.2188	57	93	12439	91749	60249
—	—	—	5.60	0.2205	57	93	12440	91750	60250
—	2	—	—	0.2210	57	93	12441	91751	60251
—	—	—	5.70	0.2244	57	93	12442	91752	60252
—	1	—	—	0.2280	57	93	12443	91753	60253
—	—	—	5.80	0.2283	57	93	12444	91754	60254
—	—	—	5.90	0.2323	57	93	12445	91755	60255
—	—	A	—	0.2340	57	93	12446	91756	60256
15/64	—	—	—	0.2344	57	93	12447	91757	60257
—	—	—	6.00	0.2362	57	93	12448	91758	60258
—	—	B	—	0.2380	63	101	12449	91759	60259

HPC High Performance Drills

# Jobber Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

Broca de alto rendimiento



List No. 1361 Bright Finish

List No. 1361G TiN — Titanium Nitride Coated

List No. 1361T TiALN — Titanium Aluminum Nitride Coated

Select the shortest drill possible for your application for maximum rigidity, hole accuracy and economy.

**Speeds & Feeds: Page 25**

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1361	List No. 1361G	List No. 1361T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	6.10	0.2402	63	101	12450	91760	60260
—	—	C	—	0.2420	63	101	12451	91761	60261
—	—	—	6.20	0.2441	63	101	12452	91762	60262
—	—	D	—	0.2460	63	101	12453	91763	60263
—	—	—	6.30	0.2480	63	101	12454	91764	60264
1/4	—	—	—	0.2500	63	101	12455	91765	60265
—	—	E	—	0.2500	63	101	12455	91765	60265
—	—	—	6.40	0.2520	63	101	12457	91767	60267
—	—	—	6.50	0.2559	63	101	12458	91768	60268
—	—	F	—	0.2570	63	101	12459	91769	60269
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—	—	—	6.60	0.2598	63	101	12460	91770	60270
—	—	G	—	0.2610	63	101	12461	91771	60271
—	—	—	6.70	0.2638	63	101	12462	91772	60272
17/64	—	—	—	0.2656	69	109	12463	91773	60273
—	—	H	—	0.2660	69	109	12464	91774	60274
—	—	—	6.80	0.2677	69	109	12465	91775	60275
—	—	—	6.90	0.2717	69	109	12466	91776	60276
—	—	I	—	0.2720	69	109	12467	91777	60277
—	—	—	7.00	0.2756	69	109	12468	91778	60278
—	—	J	—	0.2770	69	109	12469	91779	60279
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—	—	—	7.10	0.2795	69	109	12470	91780	60280
—	—	K	—	0.2810	69	109	12471	91781	60281
9/32	—	—	—	0.2812	69	109	12472	91782	60282
—	—	—	7.20	0.2835	69	109	12473	91783	60283
—	—	—	7.30	0.2874	69	109	12474	91784	60284
—	—	L	—	0.2900	69	109	12475	91785	60285
—	—	—	7.40	0.2913	69	109	12476	91786	60286
—	—	M	—	0.2950	69	109	12477	91787	60287
—	—	—	7.50	0.2953	69	109	12478	91788	60288
19/64	—	—	—	0.2969	75	117	12479	91789	60289
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—	—	—	7.60	0.2992	75	117	12480	91790	60290
—	—	N	—	0.3020	75	117	12481	91791	60291
—	—	—	7.70	0.3031	75	117	12482	91792	60292
—	—	—	7.80	0.3071	75	117	12483	91793	60293
—	—	—	7.90	0.3110	75	117	12484	91794	60294
5/16	—	—	—	0.3125	75	117	12485	91795	60295
—	—	—	8.00	0.3150	75	117	12486	91796	60296
—	—	O	—	0.3160	75	117	12487	91797	60297
—	—	—	8.10	0.3189	75	117	12488	91798	60298
—	—	—	8.20	0.3228	75	117	12489	91799	60299
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—	—	P	—	0.3230	75	117	12490	91800	60300
—	—	—	8.30	0.3268	75	117	12491	91801	60301
21/64	—	—	—	0.3281	75	117	12492	91802	60302
—	—	—	8.40	0.3307	75	117	12493	91803	60303
—	—	Q	—	0.3320	75	117	12494	91804	60304
—	—	—	8.50	0.3346	75	117	12495	91805	60305
—	—	—	8.60	0.3386	81	125	12496	91806	60306
—	—	R	—	0.3390	81	125	12497	91807	60307
—	—	—	8.70	0.3425	81	125	12498	91808	60308
11/32	—	—	—	0.3438	81	125	12499	91809	60309

HPC High Performance Drills

# Jobber Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement

Broca de alto rendimiento



List No. 1361 Bright Finish

List No. 1361G TiN — Titanium Nitride Coated

List No. 1361T TiALN — Titanium Aluminum Nitride Coated

Select the shortest drill possible for your application for maximum rigidity, hole accuracy and economy.

Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1361	List No. 1361G	List No. 1361T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	8.80	0.3465	81	125	12500	91810	60310
—	—	S	—	0.3480	81	125	12501	91811	60311
—	—	—	8.90	0.3504	81	125	12502	91812	60312
—	—	—	9.00	0.3543	81	125	12503	91813	60313
—	—	T	—	0.3580	81	125	12504	91814	60314
—	—	—	9.10	0.3583	81	125	12505	91815	60315
23/64	—	—	—	0.3594	81	125	12506	91816	60316
—	—	—	9.20	0.3622	81	125	12507	91817	60317
—	—	—	9.30	0.3661	81	125	12508	91818	60318
—	—	U	—	0.3680	81	125	12509	91819	60319
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—	—	—	9.40	0.3701	81	125	12510	91820	60320
—	—	—	9.50	0.3740	81	125	12511	91821	60321
3/8	—	—	—	0.3750	87	133	12512	91822	60322
—	—	V	—	0.3770	87	133	12513	91823	60323
—	—	—	9.60	0.3780	87	133	12514	91824	60324
—	—	—	9.70	0.3819	87	133	12515	91825	60325
—	—	—	9.80	0.3858	87	133	12516	91826	60326
—	—	W	—	0.3860	87	133	12517	91827	60327
—	—	—	9.90	0.3898	87	133	12518	91828	60328
25/64	—	—	—	0.3906	87	133	12519	91829	60329
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—	—	—	10.00	0.3937	87	133	12520	91830	60330
—	—	X	—	0.3970	87	133	12521	91831	60331
—	—	—	10.10	0.3976	87	133	12522	91832	60332
—	—	—	10.20	0.4016	87	133	12523	91833	60333
—	—	Y	—	0.4040	87	133	12524	91834	60334
—	—	—	10.30	0.4055	87	133	12525	91835	60335
13/32	—	—	—	0.4062	87	133	12526	91836	60336
—	—	—	10.40	0.4094	87	133	12527	91837	60337
—	—	Z	—	0.4130	87	133	12528	91838	60338
—	—	—	10.50	0.4134	87	133	12529	91839	60339
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—	—	—	10.60	0.4173	87	133	12530	91840	60340
—	—	—	10.70	0.4213	94	142	12531	91841	60341
27/64	—	—	—	0.4219	94	142	12532	91842	60342
—	—	—	10.80	0.4252	94	142	12533	91843	60343
—	—	—	10.90	0.4291	94	142	12534	91844	60344
—	—	—	11.00	0.4331	94	142	12535	91845	60345
—	—	—	11.10	0.4370	94	142	12536	91846	60346
7/16	—	—	—	0.4375	94	142	12537	91847	60347
—	—	—	11.20	0.4409	94	142	12538	91848	60348
—	—	—	11.30	0.4449	94	142	12539	91849	60349
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—	—	—	11.40	0.4488	94	142	12540	91850	60350
—	—	—	11.50	0.4528	94	142	12541	91851	60351
29/64	—	—	—	0.4531	94	142	12542	91852	60352
—	—	—	11.60	0.4567	94	142	12543	91853	60353
—	—	—	11.70	0.4606	94	142	12544	91854	60354
—	—	—	11.80	0.4646	94	142	12545	91855	60355
—	—	—	11.90	0.4685	101	151	12546	91856	60356
15/32	—	—	—	0.4688	101	151	12547	91857	60357
—	—	—	12.00	0.4724	101	151	12548	91858	60358
—	—	—	12.10	0.4764	101	151	12549	91859	60359
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—	—	—	12.20	0.4803	101	151	12550	91860	60360
31/64	—	—	—	0.4844	101	151	12551	91861	60361
—	—	—	12.40	0.4882	101	151	12552	91862	60362
—	—	—	12.50	0.4921	101	151	12553	91863	60363
—	—	—	12.60	0.4961	101	151	12554	91864	60364
1/2	—	—	—	0.5000	101	151	12555	91865	60365
—	—	—	12.80	0.5039	101	151	12556	91866	60366
—	—	—	12.90	0.5079	101	151	12557	91867	60367
—	—	—	13.00	0.5118	101	151	12558	91868	60368

HPC High Performance Drills

# Taper Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Longer flute length and longer overall length for increased reach and deeper hole drilling.

Foret à haut rendement Broca de alto rendimiento

Speeds & Feeds: Page 25

List No. 1362 Bright Finish

List No. 1362G TiN — Titanium Nitride Coated

List No. 1362T TiALN — Titanium Aluminum Nitride Coated



Fract.	Size			Dec. Equiv.	Flute Length MM	OAL MM	List No. 1362	List No. 1362G	List No. 1362T
	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
5/64	—	—	—	0.0780	56	85	12560	91880	60380
—	47	—	—	0.0783	56	85	12561	91881	60381
—	—	—	2.00	0.0787	56	85	12562	91882	60382
—	46	—	—	0.0810	56	85	12563	91883	60383
—	45	—	—	0.0820	56	85	12564	91884	60384
—	—	—	2.10	0.0827	56	85	12565	91885	60385
—	44	—	—	0.0860	59	90	12566	91886	60386
—	—	—	2.20	0.0866	59	90	12567	91887	60387
—	43	—	—	0.0890	59	90	12568	91888	60388
—	—	—	2.30	0.0906	59	90	12569	91889	60389
—	42	—	—	0.0935	62	95	12570	91890	60390
3/32	—	—	—	0.0938	62	95	12571	91891	60391
—	—	—	2.40	0.0945	62	95	12572	91892	60392
—	41	—	—	0.0960	62	95	12573	91893	60393
—	40	—	—	0.0980	62	95	12574	91894	60394
—	—	—	2.50	0.0984	62	95	12575	91895	60395
—	39	—	—	0.0995	62	95	12576	91896	60396
—	38	—	—	0.1015	62	95	12577	91897	60397
—	—	—	2.60	0.1024	62	95	12578	91898	60398
—	37	—	—	0.1040	62	95	12579	91899	60399
—	—	—	2.70	0.1063	66	100	12580	91900	60400
—	36	—	—	0.1067	66	100	12581	91901	60401
7/64	—	—	—	0.1094	66	100	12582	91902	60402
—	35	—	—	0.1100	66	100	12583	91903	60403
—	—	—	2.80	0.1102	66	100	12584	91904	60404
—	34	—	—	0.1110	66	100	12585	91905	60405
—	33	—	—	0.1130	66	100	12586	91906	60406
—	—	—	2.90	0.1142	66	100	12587	91907	60407
—	32	—	—	0.1160	66	100	12588	91908	60408
—	—	—	3.00	0.1181	66	100	12589	91909	60409
—	31	—	—	0.1200	69	106	12590	91910	60410
—	—	—	3.10	0.1220	69	106	12591	91911	60411
1/8	—	—	—	0.1250	69	106	12592	91912	60412
—	—	—	3.20	0.1260	69	106	12593	91913	60413
—	30	—	—	0.1285	69	106	12594	91914	60414
—	—	—	3.30	0.1299	69	106	12595	91915	60415
—	—	—	3.40	0.1339	73	112	12596	91916	60416
—	29	—	—	0.1360	73	112	12597	91917	60417
—	—	—	3.50	0.1378	73	112	12598	91918	60418
9/64	—	—	—	0.1406	73	112	12599	91919	60419
—	28	—	—	0.1405	73	112	12600	91920	60420
—	—	—	3.60	0.1417	73	112	12601	91921	60421
—	27	—	—	0.1440	73	112	12602	91922	60422
—	—	—	3.70	0.1457	73	112	12603	91923	60423
—	26	—	—	0.1470	73	112	12604	91924	60424
—	25	—	—	0.1495	78	119	12605	91925	60425
—	24	—	—	0.1520	78	119	12606	91926	60426
—	—	—	3.90	0.1535	78	119	12607	91927	60427
—	23	—	—	0.1540	78	119	12608	91928	60428
5/32	—	—	—	0.1562	78	119	12609	91929	60429

HPC High Performance Drills

# Taper Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Longer flute length and longer overall length for increased reach and deeper hole drilling.

Foret à haut rendement Broca de alto rendimiento

- List No. 1362 Bright Finish  
List No. 1362G TiN — Titanium Nitride Coated  
List No. 1362T TiALN — Titanium Aluminum Nitride Coated



Fract.	Size		Dec. Equiv.	Flute Length MM	OAL MM	List No. 1362	List No. 1362G	List No. 1362T	
	Wire	Letter				Metric	Bright Finish	TiN Coated	TiALN Coated
						EDP No.	EDP No.	EDP No.	
—	22	—	—	0.1570	78	119	12610	91930	60430
—	—	—	4.00	0.1575	78	119	12611	91931	60431
—	21	—	—	0.1590	78	119	12612	91932	60432
—	20	—	—	0.1610	78	119	12613	91933	60433
—	—	—	4.10	0.1614	78	119	12614	91934	60434
—	—	—	4.20	0.1654	78	119	12615	91935	60435
—	19	—	—	0.1660	78	119	12616	91936	60436
—	—	—	4.30	0.1693	82	126	12617	91937	60437
—	18	—	—	0.1695	82	126	12618	91938	60438
11/64	—	—	—	0.1719	82	126	12619	91939	60439
—	17	—	—	0.1730	82	126	12620	91940	60440
—	—	—	4.40	0.1732	82	126	12621	91941	60441
—	16	—	—	0.1770	82	126	12622	91942	60442
—	—	—	4.50	0.1772	82	126	12623	91943	60443
—	15	—	—	0.1800	82	126	12624	91944	60444
—	—	—	4.60	0.1811	82	126	12625	91945	60445
—	14	—	—	0.1820	82	126	12626	91946	60446
—	13	—	—	0.1850	82	126	12627	91947	60447
—	—	—	4.70	0.1850	82	126	12628	91948	60448
3/16	—	—	—	0.1875	87	132	12629	91949	60449
—	—	—	4.80	0.1890	87	132	12630	91950	60450
—	12	—	—	0.1890	87	132	12631	91951	60451
—	11	—	—	0.1910	87	132	12632	91952	60452
—	—	—	4.90	0.1929	87	132	12633	91953	60453
—	10	—	—	0.1935	87	132	12634	91954	60454
—	9	—	—	0.1960	87	132	12635	91955	60455
—	—	—	5.00	0.1969	87	132	12636	91956	60456
—	8	—	—	0.1990	87	132	12637	91957	60457
—	—	—	5.10	0.2008	87	132	12638	91958	60458
—	7	—	—	0.2010	87	132	12639	91959	60459
13/64	—	—	—	0.2031	87	132	12640	91960	60460
—	6	—	—	0.2040	87	132	12641	91961	60461
—	—	—	5.20	0.2047	87	132	12642	91962	60462
—	5	—	—	0.2055	87	132	12643	91963	60463
—	—	—	5.30	0.2087	87	132	12644	91964	60464
—	4	—	—	0.2090	91	139	12645	91965	60465
—	—	—	5.40	0.2126	91	139	12646	91966	60466
—	3	—	—	0.2130	91	139	12647	91967	60467
—	—	—	5.50	0.2165	91	139	12648	91968	60468
7/32	—	—	—	0.2188	91	139	12649	91969	60469
—	—	—	5.60	0.2205	91	139	12650	91970	60470
—	2	—	—	0.2210	91	139	12651	91971	60471
—	—	—	5.70	0.2244	91	139	12652	91972	60472
—	1	—	—	0.2280	91	139	12653	91973	60473
—	—	—	5.80	0.2283	91	139	12654	91974	60474
—	—	—	5.90	0.2323	91	139	12655	91975	60475
—	—	A	—	0.2340	91	139	12656	91976	60476
15/64	—	—	—	0.2344	91	139	12657	91977	60477
—	—	—	6.00	0.2362	91	139	12658	91978	60478
—	—	B	—	0.2380	97	148	12659	91979	60479

HPC High Performance Drills



# Taper Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Longer flute length and longer overall length for increased reach and deeper hole drilling.

Foret à haut rendement Broca de alto rendimiento

Speeds & Feeds: Page 25

- List No. 1362 Bright Finish
- List No. 1362G TiN — Titanium Nitride Coated
- List No. 1362T TiAlN — Titanium Aluminum Nitride Coated



Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1362	List No. 1362G	List No. 1362T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiAlN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	6.10	0.2402	97	148	12660	91980	60480
—	—	C	—	0.2420	97	148	12661	91981	60481
—	—	—	6.20	0.2441	97	148	12662	91982	60482
—	—	D	—	0.2460	97	148	12663	91983	60483
—	—	—	6.30	0.2480	97	148	12664	91984	60484
1/4	—	—	—	0.2500	97	148	12665	91985	60485
—	—	E	—	0.2500	97	148	12665	91985	60485
—	—	—	6.40	0.2520	97	148	12667	91987	60487
—	—	—	6.50	0.2559	97	148	12668	91988	60488
—	—	F	—	0.2570	97	148	12669	91989	60489
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—	—	—	6.60	0.2598	97	148	12670	91990	60490
—	—	G	—	0.2610	97	148	12671	91991	60491
—	—	—	6.70	0.2638	97	148	12672	91992	60492
17/64	—	—	—	0.2656	102	156	12673	91993	60493
—	—	H	—	0.2660	102	156	12674	91994	60494
—	—	—	6.80	0.2677	102	156	12675	91995	60495
—	—	—	6.90	0.2717	102	156	12676	91996	60496
—	—	I	—	0.2720	102	156	12677	91997	60497
—	—	—	7.00	0.2756	102	156	12678	91998	60498
—	—	J	—	0.2770	102	156	12679	91999	60499
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—	—	—	7.10	0.2795	102	156	12680	92000	60500
—	—	K	—	0.2810	102	156	12681	92001	60501
9/32	—	—	—	0.2812	102	156	12682	92002	60502
—	—	—	7.20	0.2835	102	156	12683	92003	60503
—	—	—	7.30	0.2874	102	156	12684	92004	60504
—	—	L	—	0.2900	102	156	12685	92005	60505
—	—	—	7.40	0.2913	102	156	12686	92006	60506
—	—	M	—	0.2950	102	156	12687	92007	60507
—	—	—	7.50	0.2953	102	156	12688	92008	60508
19/64	—	—	—	0.2969	109	165	12689	92009	60509
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—	—	—	7.60	0.2992	109	165	12690	92010	60510
—	—	N	—	0.3020	109	165	12691	92011	60511
—	—	—	7.70	0.3031	109	165	12692	92012	60512
—	—	—	7.80	0.3071	109	165	12693	92013	60513
—	—	—	7.90	0.3110	109	165	12694	92014	60514
5/16	—	—	—	0.3125	109	165	12695	92015	60515
—	—	—	8.00	0.3150	109	165	12696	92016	60516
—	—	O	—	0.3160	109	165	12697	92017	60517
—	—	—	8.10	0.3189	109	165	12698	92018	60518
—	—	—	8.20	0.3228	109	165	12699	92019	60519
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—	—	P	—	0.3230	109	165	12700	92020	60520
—	—	—	8.30	0.3268	109	165	12701	92021	60521
21/64	—	—	—	0.3281	109	165	12702	92022	60522
—	—	—	8.40	0.3307	109	165	12703	92023	60523
—	—	Q	—	0.3320	109	165	12704	92024	60524
—	—	—	8.50	0.3346	109	165	12705	92025	60525
—	—	—	8.60	0.3386	115	175	12706	92026	60526
—	—	R	—	0.3390	115	175	12707	92027	60527
—	—	—	8.70	0.3425	115	175	12708	92028	60528
11/32	—	—	—	0.3438	115	175	12709	92029	60529

HPC High Performance Drills

# Taper Length HPC Cobalt High Performance Wide Land Parabolic Flute Drills

Foret à haut rendement Broca de alto rendimiento

List No. 1362 Bright Finish

List No. 1362G TiN — Titanium Nitride Coated

List No. 1362T TiALN — Titanium Aluminum  
Nitride Coated



Size				Dec. Equiv.	Flute Length MM	OAL MM	List No. 1362	List No. 1362G	List No. 1362T
Fract.	Wire	Letter	Metric				Bright Finish	TiN Coated	TiALN Coated
							EDP No.	EDP No.	EDP No.
—	—	—	8.80	0.3465	115	175	12710	92030	60530
—	—	S	—	0.3480	115	175	12711	92031	60531
—	—	—	8.90	0.3504	115	175	12712	92032	60532
—	—	—	9.00	0.3543	115	175	12713	92033	60533
—	—	T	—	0.3580	115	175	12714	92034	60534
—	—	—	9.10	0.3583	115	175	12715	92035	60535
23/64	—	—	—	0.3594	115	175	12716	92036	60536
—	—	—	9.20	0.3622	115	175	12717	92037	60537
—	—	—	9.30	0.3661	115	175	12718	92038	60538
—	—	U	—	0.3680	115	175	12719	92039	60539
—	—	—	9.40	0.3701	115	175	12720	92040	60540
—	—	—	9.50	0.3740	115	175	12721	92041	60541
3/8	—	—	—	0.3750	121	184	12722	92042	60542
—	—	V	—	0.3770	121	184	12723	92043	60543
—	—	—	9.60	0.3780	121	184	12724	92044	60544
—	—	—	9.70	0.3819	121	184	12725	92045	60545
—	—	—	9.80	0.3858	121	184	12726	92046	60546
—	—	—	—	0.3860	121	184	12727	92047	60547
—	—	W	—	0.3898	121	184	12728	92048	60548
—	—	—	9.90	0.3906	121	184	12729	92049	60549
25/64	—	—	—	0.3937	121	184	12730	92050	60550
—	—	X	—	0.3970	121	184	12731	92051	60551
—	—	—	10.10	0.3976	121	184	12732	92052	60552
—	—	—	10.20	0.4016	121	184	12733	92053	60553
—	—	Y	—	0.4040	121	184	12734	92054	60554
—	—	—	10.30	0.4055	121	184	12735	92055	60555
13/32	—	—	—	0.4062	121	184	12736	92056	60556
—	—	—	10.40	0.4094	121	184	12737	92057	60557
—	—	Z	—	0.4130	121	184	12738	92058	60558
—	—	—	10.50	0.4134	121	184	12739	92059	60559
—	—	—	10.60	0.4173	121	184	12740	92060	60560
—	—	—	10.70	0.4213	128	195	12741	92061	60561
27/64	—	—	—	0.4219	128	195	12742	92062	60562
—	—	—	10.80	0.4252	128	195	12743	92063	60563
—	—	—	10.90	0.4291	128	195	12744	92064	60564
—	—	—	11.00	0.4331	128	195	12745	92065	60565
—	—	—	11.10	0.4370	128	195	12746	92066	60566
7/16	—	—	—	0.4375	128	195	12747	92067	60567
—	—	—	11.20	0.4409	128	195	12748	92068	60568
—	—	—	11.30	0.4449	128	195	12749	92069	60569
—	—	—	11.40	0.4488	128	195	12750	92070	60570
—	—	—	11.50	0.4528	128	195	12751	92071	60571
29/64	—	—	—	0.4531	128	195	12752	92072	60572
—	—	—	11.60	0.4567	128	195	12753	92073	60573
—	—	—	11.70	0.4606	128	195	12754	92074	60574
—	—	—	11.80	0.4646	128	195	12755	92075	60575
—	—	—	11.90	0.4685	134	205	12756	92076	60576
15/32	—	—	—	0.4688	134	205	12757	92077	60577
—	—	—	12.00	0.4724	134	205	12758	92078	60578
—	—	—	12.10	0.4764	134	205	12759	92079	60579
—	—	—	12.20	0.4803	134	205	12760	92080	60580
31/64	—	—	—	0.4844	134	205	12761	92081	60581
—	—	—	12.40	0.4882	134	205	12762	92082	60582
—	—	—	12.50	0.4921	134	205	12763	92083	60583
—	—	—	12.60	0.4961	134	205	12764	92084	60584
1/2	—	—	—	0.5000	134	205	12765	92085	60585
—	—	—	12.80	0.5039	134	205	12766	92086	60586
—	—	—	12.90	0.5079	134	205	12767	92087	60587
—	—	—	13.00	0.5118	134	205	12768	92088	60588

HPC High Performance Drills

# Speeds and Feeds

## HPC Cobalt High Performance Wide Land Parabolic Flute Drills

WORKPIECE MATERIAL	BRINELL HARDNESS BHN	SURFACE SPEED SFM	FEED PER REVOLUTION BY DRILL DIAMETER			
			1/8"	1/4"	3/8"	1/2"
<b>Low Carbon Steels</b> 1018, 12L12, 1108, 1213	≤ 120	110	0.0030	0.0040	0.0060	0.0080
<b>Low &amp; Medium Carbon Steels</b> 1018, 1551, 11L44	120 - 250	65	0.0040	0.0060	0.0085	0.0110
<b>Medium Carbon and Alloyed Steels</b> 1040, 1140, 4340, 8640	≤ 250	60	0.0030	0.0040	0.0060	0.0080
<b>Tool and Die Steels</b> P20, A2, D2, H12	≤ 250	50 - 60	0.0030	0.0040	0.0060	0.0080
<b>Tool and Die Steels</b> P20, A2, D2, H12	250 - 350	35 - 45	0.0020	0.0032	0.0049	0.0066
<b>Tool and Die Steels</b> P20, A2, D2, H12	350 - 400	15 - 25	0.0013	0.0022	0.0031	0.0040
<b>Free Machining Stainless Steels</b> 303, 410, 416, 440F	≤ 250	60	0.0020	0.0032	0.0049	0.0066
<b>Moderate Machining Stainless Steels</b> 304, 316	≤ 300	45	0.0032	0.0050	0.0063	0.0075
<b>Difficult Machining Stainless Steels</b> 17-4PH, 316L, AM350	≤ 300	30	0.0020	0.0031	0.0047	0.0062
<b>Cast Iron</b> Grey & Free Machining Malleable	≤ 250	80	0.0030	0.0040	0.0060	0.0080
<b>Cast Iron</b> Hard Grey	≤ 300	55	0.0020	0.0032	0.0049	0.0066
<b>Titanium Alloys</b> Commercially Pure 99.0	≤ 200	90	0.0030	0.0040	0.0060	0.0080
<b>Titanium Alloys</b> Ti-6Al-4V, ASTM B367 Grades C-3, C-4	≤ 350	20 - 30	0.0020	0.0032	0.0049	0.0066
<b>High Temperature Alloys</b> Inconel, Hastelloy, Waspaloy	≤ 150	50	0.0030	0.0040	0.0060	0.0080
<b>High Temperature Alloys</b> Inconel, Hastelloy, Waspaloy	150 - 250	20	0.0010	0.0020	0.0033	0.0045
<b>Aluminum Alloys</b> 2025, 6061, A140, 514.0	≤ 150	325	0.0040	0.0060	0.0085	0.0110
<b>Copper Alloys</b> Brass and Bronze	≤ 200	80	0.0040	0.0060	0.0085	0.0110
<b>Composite &amp; Plastics</b>	≤ 128	175	0.0020	0.0030	0.0045	0.0060
<b>Magnesium Alloys</b> AZ80A, HM12A, AM60A, ZE41A	50 - 90	325	0.0040	0.0060	0.0085	0.0110

**NOTE:** The speeds and feeds shown are suggested starting points only and may be increased or decreased depending on actual material and machining conditions. Start conservatively and increase speed and feed until drilling cycle is optimized.

For TiN coated drills increase speed by up to 20% depending on actual material and machining conditions.

For TiAlN coated drills increase speed by up to 50% depending on actual material and machining conditions.

SIZE SPECIFICATIONS:	
Screw Machine Length	Din 1897
Jobber Length	Din 338
Taper Length	Din 340

# Jobber Length Drills

## Straight Shank - High Speed Steel

### 118° Point - General Purpose

Designed for drilling a wide variety of materials.

**Black Oxide Surface Treatment** increases wear resistance, reduces galling and chip welding, improves chip flow and increases drill lubricant retention.

**Bright Finish** with polished flutes enhances chip ejection especially for aluminum and other non-ferrous materials.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Enhanced hole quality at higher speeds and feeds.

#### STANDARD PACKAGE

##### Fractional Sizes

1/64" thru 3/8" - 12 each

25/64" thru 1/2" - 6 each

33/64" thru 11/16" - 1 each

##### Letter Sizes

A thru V - 12 each

W thru Z - 6 each

##### Wire Gage Sizes

#1 thru #80 - 12 each

Foret court

Broca Uso Multiple



BLACK OXIDE TREATED

- List No. 1330 Fractional
- List No. 1332 Letter
- List No. 1340 Wire Gage



BRIGHT FINISH

- List No. 1330B Fractional
- List No. 1332B Letter
- List No. 1340B Wire Gage



TITANIUM NITRIDE COATED

- List No. 1330G All Sizes

FRAC-TIONAL	SIZE		FLUTE LENGTH	OAL	1330, 1332, 1340		1330B, 1332B, 1340B		1330G EDP NO.
	WIRE GAGE	DEC. EQUIV.			EDP NO.	EDP NO.			
1/64	80	.0135	1/8	3/4	11351	11551	—	—	—
	79	.0145	1/8	3/4	11352	11552	—	—	—
		.0156	3/16	3/4	11353	11553	—	—	—
	78	.0160	3/16	7/8	11354	11554	—	—	—
	77	.0180	3/16	7/8	11355	11555	—	—	—
1/32	76	.0200	3/16	7/8	11356	11556	—	—	—
	75	.0210	1/4	1	11357	11557	—	—	—
	74	.0225	1/4	1	11358	11558	—	—	—
	73	.0240	5/16	1 1/8	11359	11559	—	—	—
	72	.0250	5/16	1 1/8	11360	11560	—	—	—
	71	.0260	3/8	1 1/4	11361	11561	—	—	—
	70	.0280	3/8	1 1/4	11362	11562	—	—	—
3/64	69	.0292	1/2	1 3/8	11363	11563	—	—	—
	68	.0310	1/2	1 3/8	11364	11564	—	—	—
		.0312	1/2	1 3/8	11365	11565	—	—	—
	67	.0320	1/2	1 3/8	11366	11566	—	—	—
	66	.0330	1/2	1 3/8	11367	11567	—	—	—
1/16	65	.0350	5/8	1 1/2	11368	11568	—	—	—
	64	.0360	5/8	1 1/2	11369	11569	—	—	—
	63	.0370	5/8	1 1/2	11370	11570	—	—	—
	62	.0380	5/8	1 1/2	11371	11571	—	—	—
	61	.0390	1 1/16	1 5/8	11372	11572	—	—	—
3/32	60	.0400	1 1/16	1 5/8	11373	11573	91373	—	—
	59	.0410	1 1/16	1 5/8	11374	11574	91374	—	—
	58	.0420	1 1/16	1 5/8	11375	11575	91375	—	—
	57	.0430	3/4	1 3/4	11376	11576	91376	—	—
	56	.0465	3/4	1 3/4	11377	11577	91377	—	—
1/8		.0469	3/4	1 3/4	11378	11578	91378	—	—
	55	.0520	7/8	1 7/8	11379	11579	91379	—	—
	54	.0550	7/8	1 7/8	11380	11580	91380	—	—
1/4	53	.0595	7/8	1 7/8	11381	11581	91381	—	—
		.0625	7/8	1 7/8	11382	11582	91382	—	—
	52	.0635	7/8	1 7/8	11383	11583	91383	—	—
	51	.0670	1	2	11384	11584	91384	—	—
	50	.0700	1	2	11385	11585	91385	—	—
	49	.0730	1	2	11386	11586	91386	—	—

(continued)

# Jobber Length Drills (continued)

Foret court

Broca Uso Multiple

List Nos. 1330/B, 1332/B, 1340/B and 1330G

FRAC-TIONAL	SIZE		FLUTE LENGTH	OAL	1330, 1332,	1330B, 1332B,	1330G
	WIRE GAGE	DEC. EQUIV.			1340 EDP NO.	1340B EDP NO.	EDP NO.
5/64	48	.0760	1	2	11387	11587	91387
		.0781	1	2	11388	11588	91388
	47	.0785	1	2	11389	11589	91389
	46	.0810	1 1/8	2 1/8	11390	11590	91390
	45	.0820	1 1/8	2 1/8	11391	11591	91391
3/32	44	.0860	1 1/8	2 1/8	11392	11592	91392
	43	.0890	1 1/4	2 1/4	11393	11593	91393
	42	.0935	1 1/4	2 1/4	11394	11594	91394
		.0937	1 1/4	2 1/4	11395	11595	91395
	41	.0960	1 3/8	2 3/8	11396	11596	91396
	40	.0980	1 3/8	2 3/8	11397	11597	91397
	39	.0995	1 3/8	2 3/8	11398	11598	91398
38	.1015	1 7/16	2 1/2	11399	11599	91399	
37	.1040	1 7/16	2 1/2	11400	11600	91400	
36	.1065	1 7/16	2 1/2	11401	11601	91401	
7/64		.1094	1 1/2	2 5/8	11402	11602	91402
	35	.1100	1 1/2	2 5/8	11403	11603	91403
	34	.1110	1 1/2	2 5/8	11404	11604	91404
	33	.1130	1 1/2	2 5/8	11405	11605	91405
	32	.1160	1 5/8	2 3/4	11406	11606	91406
1/8	31	.1200	1 5/8	2 3/4	11407	11607	91407
		.1250	1 5/8	2 3/4	11408	11608	91408
	30	.1285	1 5/8	2 3/4	11409	11609	91409
	29	.1360	1 3/4	2 7/8	11410	11610	91410
28	.1405	1 3/4	2 7/8	11411	11611	91411	
9/64		.1406	1 3/4	2 7/8	11412	11612	91412
	27	.1440	1 7/8	3	11413	11613	91413
	26	.1470	1 7/8	3	11414	11614	91414
	25	.1495	1 7/8	3	11415	11615	91415
	24	.1520	2	3 1/8	11416	11616	91416
5/32	23	.1540	2	3 1/8	11417	11617	91417
		.1562	2	3 1/8	11418	11618	91418
	22	.1570	2	3 1/8	11419	11619	91419
	21	.1590	2 1/8	3 1/4	11420	11620	91420
	20	.1610	2 1/8	3 1/4	11421	11621	91421
11/64	19	.1660	2 1/8	3 1/4	11422	11622	91422
	18	.1695	2 1/8	3 1/4	11423	11623	91423
		.1719	2 1/8	3 1/4	11424	11624	91424
	17	.1730	2 3/16	3 3/8	11425	11625	91425
	16	.1770	2 3/16	3 3/8	11426	11626	91426
3/16	15	.1800	2 3/16	3 3/8	11427	11627	91427
	14	.1820	2 3/16	3 3/8	11428	11628	91428
	13	.1850	2 5/16	3 1/2	11429	11629	91429
		.1875	2 5/16	3 1/2	11430	11630	91430
	12	.1890	2 5/16	3 1/2	11431	11631	91431
		.1910	2 5/16	3 1/2	11432	11632	91432
13/64	11	.1910	2 5/16	3 1/2	11432	11632	91432
	10	.1935	2 7/16	3 5/8	11433	11633	91433
	9	.1960	2 7/16	3 5/8	11434	11634	91434
	8	.1990	2 7/16	3 5/8	11435	11635	91435
	7	.2010	2 7/16	3 5/8	11436	11636	91436
		.2031	2 7/16	3 5/8	11437	11637	91437
	6	.2040	2 1/2	3 3/4	11438	11638	91438
5	.2055	2 1/2	3 3/4	11439	11639	91439	
4	.2090	2 1/2	3 3/4	11440	11640	91440	
3	.2130	2 1/2	3 3/4	11441	11641	91441	
7/32		.2187	2 1/2	3 3/4	11442	11642	91442
	2	.2210	2 5/8	3 7/8	11443	11643	91443
	1	.2280	2 5/8	3 7/8	11444	11644	91444

(continued)

# Jobber Length Drills (continued)

Foret court

Broca Uso Multiple

List Nos. 1330/B, 1332/B and 1330G

FRAC-TIONAL	SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	1330, 1332 EDP NO.	1330B, 1332B EDP NO.	1330G EDP NO.
	LETTER							
15/64	A		.2340	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	11445	11645	91445
			.2344	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	11446	11646	91446
	B		.2380	2 <sup>3</sup> / <sub>4</sub>	4	11447	11647	91447
	C		.2420	2 <sup>3</sup> / <sub>4</sub>	4	11448	11648	91448
	D		.2460	2 <sup>3</sup> / <sub>4</sub>	4	11449	11649	91449
1/4	E		.2500	2 <sup>3</sup> / <sub>4</sub>	4	11450	11650	91450
	F		.2570	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11452	11652	91452
	G		.2610	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11453	11653	91453
17/64			.2656	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11454	11654	91454
	H		.2660	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11455	11655	91455
	I		.2720	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11456	11656	91456
9/32	J		.2770	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	11457	11657	91457
	K		.2810	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	11458	11658	91458
			.2812	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	11459	11659	91459
	L		.2900	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	11460	11660	91460
	19/64	M		.2950	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	11461	11661
			.2969	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	11462	11662	91462
N			.3020	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	11463	11663	91463
5/16			.3125	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	11464	11664	91464
	O		.3160	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	11465	11665	91465
21/64	P		.3230	3 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	11466	11666	91466
			.3281	3 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	11467	11667	91467
	Q		.3320	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	11468	11668	91468
	R		.3390	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	11469	11669	91469
11/32			.3437	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	11470	11670	91470
	S		.3480	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	11471	11671	91471
23/64	T		.3580	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	11472	11672	91472
			.3594	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	11473	11673	91473
	U		.3680	3 <sup>5</sup> / <sub>8</sub>	5	11474	11674	91474
3/8			.3750	3 <sup>5</sup> / <sub>8</sub>	5	11475	11675	91475
	V		.3770	3 <sup>5</sup> / <sub>8</sub>	5	11476	11676	91476
25/64	W		.3860	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	11477	11677	91477
			.3906	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	11478	11678	91478
	X		.3970	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	11479	11679	91479
	Y		.4040	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	11480	11680	91480
	13/32			.4062	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	11481	11681
Z			.4130	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	11482	11682	91482
27/64		.4219	3 <sup>15</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	11483	11683	91483	
7/16		.4375	4 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	11484	11684	91484	
29/64		.4531	4 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	11485	11685	91485	
15/32		.4687	4 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	11486	11686	91486	
31/64		.4844	4 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	11487	11687	91487	
1/2		.5000	4 <sup>1</sup> / <sub>2</sub>	6	11488	11688	91488	
33/64		.5156	4 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	11489	—	—	
17/32		.5312	4 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	11490	—	—	
35/64		.5469	4 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	11491	—	—	
9/16		.5625	4 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	11492	—	—	
37/64		.5781	4 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	11493	—	—	
19/32		.5938	5 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	11494	—	—	
39/64		.6094	5 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	11495	—	—	
5/8		.6250	5 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	11496	—	—	
41/64		.6406	5 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	11497	—	—	
21/32		.6562	5 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	11498	—	—	
43/64		.6719	5 <sup>5</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	11499	—	—	
11/16		.6875	5 <sup>5</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	11500	—	—	

# Aircraft Type A Jobber Length Drills

**Straight Shank — High Speed Steel**  
**118° Split Point — Black Oxide Treated**

118° Self-centering split point eliminates "walking" and reduces thrust. Recommended for drilling a wide range of materials.

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	40	.0980	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	<b>14601</b>
	39	.0995	1 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	<b>14602</b>
	38	.1015	1 <sup>7</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	<b>14603</b>
	37	.1040	1 <sup>7</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	<b>14604</b>
	36	.1065	1 <sup>7</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	<b>14605</b>
<sup>7</sup> / <sub>64</sub>		.1094	1 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>8</sub>	<b>14606</b>
	35	.1100	1 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>8</sub>	<b>14607</b>
	34	.1110	1 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>8</sub>	<b>14608</b>
	33	.1130	1 <sup>1</sup> / <sub>2</sub>	2 <sup>5</sup> / <sub>8</sub>	<b>14609</b>
	32	.1160	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	<b>14610</b>
	31	.1200	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	<b>14611</b>
<sup>1</sup> / <sub>8</sub>		.1250	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	<b>14612</b>
	30	.1285	1 <sup>5</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	<b>14613</b>
	29	.1360	1 <sup>3</sup> / <sub>4</sub>	2 <sup>7</sup> / <sub>8</sub>	<b>14614</b>
	28	.1405	1 <sup>3</sup> / <sub>4</sub>	2 <sup>7</sup> / <sub>8</sub>	<b>14615</b>
<sup>9</sup> / <sub>64</sub>		.1406	1 <sup>3</sup> / <sub>4</sub>	2 <sup>7</sup> / <sub>8</sub>	<b>14616</b>
	27	.1440	1 <sup>7</sup> / <sub>8</sub>	3	<b>14617</b>
	26	.1470	1 <sup>7</sup> / <sub>8</sub>	3	<b>14618</b>
	25	.1495	1 <sup>7</sup> / <sub>8</sub>	3	<b>14619</b>
	24	.1520	2	3 <sup>1</sup> / <sub>8</sub>	<b>14620</b>
	23	.1540	2	3 <sup>1</sup> / <sub>8</sub>	<b>14621</b>
<sup>5</sup> / <sub>32</sub>		.1562	2	3 <sup>1</sup> / <sub>8</sub>	<b>14622</b>
	22	.1570	2	3 <sup>1</sup> / <sub>8</sub>	<b>14623</b>
	21	.1590	2 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>14624</b>
	20	.1610	2 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>14625</b>
	19	.1660	2 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>14626</b>
	18	.1695	2 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>14627</b>
<sup>11</sup> / <sub>64</sub>		.1719	2 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>14628</b>
	17	.1730	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	<b>14629</b>
	16	.1770	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	<b>14630</b>
	15	.1800	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	<b>14631</b>
	14	.1820	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	<b>14632</b>
<sup>3</sup> / <sub>16</sub>		.1850	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	<b>14633</b>
	13	.1875	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	<b>14634</b>
	12	.1890	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	<b>14635</b>
	11	.1910	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	<b>14636</b>
	10	.1935	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<b>14637</b>
	9	.1960	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<b>14638</b>
	8	.1990	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<b>14639</b>
	7	.2010	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<b>14640</b>
<sup>13</sup> / <sub>64</sub>		.2031	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	<b>14641</b>
	6	.2040	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>14642</b>
	5	.2055	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>14643</b>
	4	.2090	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>14644</b>
	3	.2130	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>14645</b>
<sup>7</sup> / <sub>32</sub>		.2187	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>14646</b>

Foret court

Broca Uso Multiple



List No. 1396 – NAS 907, Type A

**STANDARD PACKAGE** Fractional Sizes  
7/64" thru 3/8" – 12 each  
25/64" thru 1/2" – 6 each

**Letter Sizes**  
A thru V – 12 each  
W thru Z – 6 each

**Wire Gage Sizes**  
#1 thru #40 – 12 each

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	2	.2210	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	<b>14647</b>
	1	.2280	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	<b>14648</b>
	A	.2340	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	<b>14671</b>
<sup>15</sup> / <sub>64</sub>		.2344	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	<b>14650</b>
	B	.2380	2 <sup>3</sup> / <sub>4</sub>	4	<b>14672</b>
	C	.2420	2 <sup>3</sup> / <sub>4</sub>	4	<b>14674</b>
	D	.2460	2 <sup>3</sup> / <sub>4</sub>	4	<b>14676</b>
<sup>1</sup> / <sub>4</sub>		.2500	2 <sup>3</sup> / <sub>4</sub>	4	<b>14678</b>
	E	.2570	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14679</b>
	F	.2570	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14681</b>
	G	.2610	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14681</b>
<sup>17</sup> / <sub>64</sub>		.2656	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14658</b>
	H	.2660	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14682</b>
	I	.2720	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14684</b>
	J	.2770	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>14691</b>
	K	.2810	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	<b>14692</b>
<sup>9</sup> / <sub>32</sub>		.2812	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	<b>14663</b>
	L	.2900	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	<b>14693</b>
	M	.2950	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	<b>14694</b>
<sup>19</sup> / <sub>64</sub>		.2969	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	<b>14665</b>
	N	.3020	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	<b>14695</b>
<sup>5</sup> / <sub>16</sub>		.3125	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	<b>14667</b>
	O	.3160	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	<b>14696</b>
	P	.3230	3 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	<b>14697</b>
<sup>21</sup> / <sub>64</sub>		.3281	3 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	<b>14670</b>
	Q	.3320	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	<b>14698</b>
	R	.3390	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	<b>14699</b>
<sup>11</sup> / <sub>32</sub>		.3437	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	<b>14673</b>
	S	.3480	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	<b>14700</b>
	T	.3580	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	<b>14701</b>
<sup>23</sup> / <sub>64</sub>		.3594	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	<b>14675</b>
	U	.3680	3 <sup>5</sup> / <sub>8</sub>	5	<b>14702</b>
<sup>3</sup> / <sub>8</sub>		.3750	3 <sup>5</sup> / <sub>8</sub>	5	<b>14677</b>
	V	.3770	3 <sup>5</sup> / <sub>8</sub>	5	<b>14703</b>
	W	.3860	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	<b>14704</b>
<sup>25</sup> / <sub>64</sub>		.3906	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	<b>14680</b>
	X	.3970	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	<b>14705</b>
	Y	.4040	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	<b>14706</b>
<sup>13</sup> / <sub>32</sub>		.4062	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	<b>14683</b>
	Z	.4130	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	<b>14707</b>
<sup>27</sup> / <sub>64</sub>		.4219	3 <sup>15</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	<b>14685</b>
<sup>7</sup> / <sub>16</sub>		.4375	4 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	<b>14686</b>
<sup>29</sup> / <sub>64</sub>		.4531	4 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	<b>14687</b>
<sup>15</sup> / <sub>32</sub>		.4687	4 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	<b>14688</b>
<sup>31</sup> / <sub>64</sub>		.4844	4 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	<b>14689</b>
<sup>1</sup> / <sub>2</sub>		.5000	4 <sup>1</sup> / <sub>2</sub>	6	<b>14690</b>

# Ambore™ Heavy Duty Jobber Length Drills

**Straight Shank — High Speed Steel**  
**135° Split Point — Heavy Duty**

135° Self-centering split point eliminates “walking” and reduces thrust. Recommended for a wide variety of low to medium tensile strength materials.

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/16	.0625	7/8	1 7/8	12062
5/64	.0781	1	2	12063
3/32	.0938	1 1/4	2 1/4	12064
7/64	.1094	1 1/2	2 5/8	12065
1/8	.1250	1 5/8	2 3/4	12066
9/64	.1406	1 3/4	2 7/8	12067
5/32	.1562	2	3 1/8	12068
11/64	.1719	2 1/8	3 1/4	12069
3/16	.1875	2 5/16	3 1/2	12070
13/64	.2031	2 7/16	3 5/8	12071
7/32	.2188	2 1/2	3 3/4	12072
15/64	.2344	2 5/8	3 7/8	12073
1/4	.2500	2 3/4	4	12074
17/64	.2656	2 7/8	4 1/8	12075
9/32	.2812	2 15/16	4 1/4	12076

# Aircraft Type B Heavy Duty Jobber Length Drills

**Straight Shank — High Speed Steel**  
**135° Split Point — Black Oxide Treated**

135° Self-centering split point eliminates “walking” and reduces thrust. Recommended for a wide variety of low to medium tensile strength materials.

SIZE	FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/64		80	.0135	1/8	3/4	14301*
		79	.0145	1/8	3/4	14302*
			.0156	3/16	3/4	14303*
		78	.0160	3/16	7/8	14304*
		77	.0180	3/16	7/8	14305*
		76	.0200	3/16	7/8	14306*
1/32		75	.0210	1/4	1	14307*
		74	.0225	1/4	1	14308*
		73	.0240	5/16	1 1/8	14309*
		72	.0250	5/16	1 1/8	14310*
		71	.0260	3/8	1 1/4	14311*
		70	.0280	3/8	1 1/4	14312*
		69	.0292	1/2	1 3/8	14313*
	68	.0310	1/2	1 3/8	14314*	
		.0312	1/2	1 3/8	14315*	
	67	.0320	1/2	1 3/8	14316*	
	66	.0330	1/2	1 3/8	14317*	

\* Sizes #53 and smaller furnished with 135° regular point

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Broca Uso Multiple



List No. 1384 — Gold & Black Finish

**STANDARD PACKAGE** Fractional Sizes  
1/16" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
19/64	.2969	3 1/16	4 3/8	12077
5/16	.3125	3 3/16	4 1/2	12078
21/64	.3281	3 5/16	4 5/8	12079
11/32	.3438	3 7/16	4 3/4	12080
23/64	.3594	3 1/2	4 7/8	12081
3/8	.3750	3 5/8	5	12082
25/64	.3906	3 3/4	5 1/8	12083
13/32	.4062	3 7/8	5 1/4	12084
27/64	.4219	3 9/16	5 3/8	12085
7/16	.4375	4 1/16	5 1/2	12086
29/64	.4531	4 3/16	5 5/8	12087
15/32	.4688	4 5/16	5 3/4	12088
31/64	.4844	4 3/8	5 7/8	12089
1/2	.5000	4 1/2	6	12090

Foret court

Broca Uso Multiple



List No. 1385 - NAS 907, Type B

**STANDARD PACKAGE** Fractional Sizes  
1/64" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

**Letter Sizes**  
A thru V — 12 each  
W thru Z — 6 each

**Wire Gage Sizes**  
#1 thru #80 — 12 each

SIZE	FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/64		65	.0350	5/8	1 1/2	14318*
		64	.0360	5/8	1 1/2	14319*
		63	.0370	5/8	1 1/2	14320*
		62	.0380	5/8	1 1/2	14321*
		61	.0390	11/16	1 5/8	14322*
		60	.0400	11/16	1 5/8	14323*
		59	.0410	11/16	1 5/8	14324*
		58	.0420	11/16	1 5/8	14325*
		57	.0430	3/4	1 3/4	14326*
		56	.0465	3/4	1 3/4	14327*
3/64			.0469	3/4	1 3/4	14328*
		55	.0520	7/8	1 7/8	14329*
		54	.0550	7/8	1 7/8	14330*
1/16		53	.0595	7/8	1 7/8	14331*
			.0625	7/8	1 7/8	14451
		52	.0635	7/8	1 7/8	14452
		51	.0670	1	2	14453

(continued)



# Aircraft Type B Jobber Length Drills (continued)

List No. 1385

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
5/64	50	.0700	1	2	14454
	49	.0730	1	2	14455
	48	.0760	1	2	14456
		.0781	1	2	14457
	47	.0785	1	2	14458
3/32	46	.0810	1 1/8	2 1/8	14459
	45	.0820	1 1/8	2 1/8	14460
	44	.0860	1 1/8	2 1/8	14461
	43	.0890	1 1/4	2 1/4	14462
	42	.0935	1 1/4	2 1/4	14463
7/64		.0937	1 1/4	2 1/4	14464
	41	.0960	1 3/8	2 3/8	14465
	40	.0980	1 3/8	2 3/8	14466
	39	.0995	1 3/8	2 3/8	14467
	38	.1015	1 7/16	2 1/2	14468
1/8	37	.1040	1 7/16	2 1/2	14469
	36	.1065	1 7/16	2 1/2	14470
		.1094	1 1/2	2 5/8	14471
	35	.1100	1 1/2	2 5/8	14472
	34	.1110	1 1/2	2 5/8	14473
9/64	33	.1130	1 1/2	2 5/8	14474
	32	.1160	1 5/8	2 3/4	14475
	31	.1200	1 5/8	2 3/4	14476
		.1250	1 5/8	2 3/4	14477
	30	.1285	1 5/8	2 3/4	14478
5/32	29	.1360	1 3/4	2 7/8	14479
	28	.1405	1 3/4	2 7/8	14480
		.1406	1 3/4	2 7/8	14481
	27	.1440	1 7/8	3	14482
	26	.1470	1 7/8	3	14483
11/64	25	.1495	1 7/8	3	14484
	24	.1520	2	3 1/8	14485
	23	.1540	2	3 1/8	14486
		.1562	2	3 1/8	14487
	22	.1570	2	3 1/8	14488
3/16	21	.1590	2 1/8	3 1/4	14489
	20	.1610	2 1/8	3 1/4	14490
	19	.1660	2 1/8	3 1/4	14491
	18	.1695	2 1/8	3 1/4	14492
		.1719	2 1/8	3 1/4	14493
7/32	17	.1730	2 3/16	3 3/8	14494
	16	.1770	2 3/16	3 3/8	14495
	15	.1800	2 3/16	3 3/8	14496
	14	.1820	2 3/16	3 3/8	14497
	13	.1850	2 5/16	3 1/2	14498
1/4		.1875	2 5/16	3 1/2	14499
	12	.1890	2 5/16	3 1/2	14500
	11	.1910	2 5/16	3 1/2	14501
	10	.1935	2 7/16	3 5/8	14502
	9	.1960	2 7/16	3 5/8	14503
5/16	8	.1990	2 7/16	3 5/8	14504
	7	.2010	2 7/16	3 5/8	14505
		.2031	2 7/16	3 5/8	14506
	6	.2040	2 1/2	3 3/4	14507
	5	.2055	2 1/2	3 3/4	14508
3/8	4	.2090	2 1/2	3 3/4	14509
	3	.2130	2 1/2	3 3/4	14510
		.2187	2 1/2	3 3/4	14511
	2	.2210	2 5/8	3 7/8	14512
	1	.2280	2 5/8	3 7/8	14513

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Broca Uso Multiple

SIZE					
FRAC-TIONAL	LETTER	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
15/64	A	.2340	2 5/8	3 7/8	14514
		.2344	2 5/8	3 7/8	14515
	B	.2380	2 3/4	4	14516
	C	.2420	2 3/4	4	14517
1/4	D	.2460	2 3/4	4	14518
	E	.2500	2 3/4	4	14519
	F	.2570	2 7/8	4 1/8	14521
	G	.2610	2 7/8	4 1/8	14522
17/64	H	.2656	2 7/8	4 1/8	14523
		.2660	2 7/8	4 1/8	14524
	I	.2720	2 7/8	4 1/8	14525
	J	.2770	2 7/8	4 1/8	14526
9/32	K	.2810	2 15/16	4 1/4	14527
		.2812	2 15/16	4 1/4	14528
	L	.2900	2 15/16	4 1/4	14529
	M	.2950	3 1/16	4 3/8	14530
19/64		.2969	3 1/16	4 3/8	14531
	N	.3020	3 1/16	4 3/8	14532
	5/16	.3125	3 3/16	4 1/2	14533
	O	.3160	3 3/16	4 1/2	14534
21/64	P	.3230	3 5/16	4 5/8	14535
		.3281	3 5/16	4 5/8	14536
	Q	.3320	3 7/16	4 3/4	14537
	R	.3390	3 7/16	4 3/4	14538
11/32		.3437	3 7/16	4 3/4	14539
	S	.3480	3 1/2	4 7/8	14540
	T	.3580	3 1/2	4 7/8	14541
	23/64	.3594	3 1/2	4 7/8	14542
3/8	U	.3680	3 5/8	5	14543
		.3750	3 5/8	5	14544
	V	.3770	3 5/8	5	14545
	W	.3860	3 3/4	5 1/8	14546
25/64		.3906	3 3/4	5 1/8	14547
	X	.3970	3 3/4	5 1/8	14548
	Y	.4040	3 7/8	5 1/4	14549
	13/32	.4062	3 7/8	5 1/4	14550
7/16	Z	.4130	3 7/8	5 1/4	14551
		.4219	3 15/16	5 3/8	14552
		.4375	4 1/16	5 1/2	14553
	29/64	.4531	4 3/16	5 5/8	14554
15/32		.4687	4 5/16	5 3/4	14555
	31/64	.4844	4 3/8	5 7/8	14556
	1/2	.5000	4 1/2	6	14557

**CUTTING FLUIDS** provide many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Automotive Series Jobber Length Drills

**Straight Shank — High Speed Steel**  
**118° Point — Black Oxide Treated**

Designed for drilling a wide variety of materials, this drill will perform well under many different operating conditions. Tanged shank allows use with ASA split sleeve drivers.

Foret court

Broca Uso Multiple



## List No. 1330A - Tanged Shank

**STANDARD PACKAGE**      **Fractional Sizes**  
1/8" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each  
35/64" thru 11/16" — 1 each

**Letter Sizes**  
12 each

**Wire Gage Sizes**  
12 each  
**Metric Sizes**  
12 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/8	.1250	1 5/8	2 3/4	<b>12101</b>
30	.1285	1 5/8	2 3/4	<b>12102</b>
29	.1360	1 3/4	2 7/8	<b>12103</b>
9/64	.1406	1 3/4	2 7/8	<b>12104</b>
26	.1470	1 7/8	3	<b>12106</b>
5/32	.1562	2	3 1/8	<b>12108</b>
20	.1610	2 1/8	3 1/4	<b>12109</b>
19	.1660	2 1/8	3 1/4	<b>12110</b>
1 1/64	.1719	2 1/8	3 1/4	<b>12112</b>
17	.1730	2 3/16	3 3/8	<b>12113</b>
16	.1770	2 3/16	3 3/8	<b>12114</b>
15	.1800	2 3/16	3 3/8	<b>12115</b>
3/16	.1875	2 5/16	3 1/2	<b>12117</b>
11	.1910	2 5/16	3 1/2	<b>12118</b>
13/64	.2031	2 7/16	3 5/8	<b>12122</b>
7/32	.2187	2 1/2	3 3/4	<b>12125</b>
15/64	.2344	2 5/8	3 7/8	<b>12127</b>
1/4 - E	.2500	2 3/4	4	<b>12129</b>
G	.2610	2 7/8	4 1/8	<b>12131</b>
17/64	.2656	2 7/8	4 1/8	<b>12132</b>
J	.2770	2 7/8	4 1/8	<b>12134</b>
9/32	.2812	2 15/16	4 1/4	<b>12135</b>

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
19/64	.2969	3 1/16	4 3/8	<b>12136</b>
5/16	.3125	3 3/16	4 1/2	<b>12138</b>
21/64	.3281	3 5/16	4 5/8	<b>12141</b>
Q	.3320	3 7/16	4 3/4	<b>12142</b>
11/32	.3437	3 7/16	4 3/4	<b>12144</b>
S	.3480	3 1/2	4 7/8	<b>12145</b>
23/64	.3594	3 1/2	4 7/8	<b>12146</b>
U	.3680	3 5/8	5	<b>12147</b>
3/8	.3750	3 5/8	5	<b>12148</b>
25/64	.3906	3 3/4	5 1/8	<b>12150</b>
13/32	.4062	3 7/8	5 1/4	<b>12152</b>
27/64	.4219	3 15/16	5 3/8	<b>12153</b>
7/16	.4375	4 1/16	5 1/2	<b>12154</b>
29/64	.4531	4 3/16	5 5/8	<b>12155</b>
15/32	.4687	4 5/16	5 3/4	<b>12156</b>
1/2	.5000	4 1/2	6	<b>12158</b>
35/64	.5469	4 13/16	6 5/8	<b>12161*</b>
9/16	.5625	4 13/16	6 5/8	<b>12162</b>
5/8	.6250	5 3/16	7 1/8	<b>12166</b>
41/64	.6406	5 3/16	7 1/8	<b>12167</b>
43/64	.6719	5 5/8	7 5/8	<b>12169*</b>
11/16	.6875	5 5/8	7 5/8	<b>12170</b>

\* Available While Supplies Last

## Metric Sizes - Tanged Shank

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
3.30 mm	.1299	44	73	<b>12171*</b>
3.40 mm	.1339	44	73	<b>12172*</b>
6.10 mm	.2402	70	102	<b>12175*</b>

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
7.40 mm	.2913	78	111	<b>12178*</b>
9.00 mm	.3543	89	124	<b>12180*</b>

\* Available While Supplies Last

## TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Left Hand Jobber Length Drills

Straight Shank – High Speed Steel  
118° Point

Used extensively in screw machine operations and in close center multiple spindle gear driven drilling heads where adjacent spindles operate alternately right and left hand.

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	77	.0180	3/16	7/8	11954*
	75	.0210	1/4	1	11956*
	71	.0260	3/8	1 1/4	11960*
	69	.0292	1/2	1 3/8	11962*
	66	.0330	1/2	1 3/8	11966*
	63	.0370	5/8	1 1/2	11969*
	62	.0380	5/8	1 1/2	11970*
	61	.0390	1 1/16	1 5/8	11971*
	60	.0400	1 1/16	1 5/8	11972*
	56	.0465	3/4	1 3/4	11976*
1/16		.0625	7/8	1 7/8	11981
	52	.0635	7/8	1 7/8	11982
	51	.0670	1	2	11983
	50	.0700	1	2	11984
	49	.0730	1	2	11985
5/64	48	.0760	1	2	11986
		.0781	1	2	11987
	47	.0785	1	2	11988
	46	.0810	1 1/8	2 1/8	11989
	45	.0820	1 1/8	2 1/8	11990
	44	.0860	1 1/8	2 1/8	11991
	43	.0890	1 1/4	2 1/4	11992
	42	.0935	1 1/4	2 1/4	11993
3/32		.0937	1 1/4	2 1/4	11994
	41	.0960	1 3/8	2 3/8	11995
	40	.0980	1 3/8	2 3/8	11996
	39	.0995	1 3/8	2 3/8	11997
	38	.1015	1 7/16	2 1/2	11998
	37	.1040	1 7/16	2 1/2	11999
	36	.1065	1 7/16	2 1/2	12000
7/64		.1094	1 1/2	2 5/8	12001
	35	.1100	1 1/2	2 5/8	12002
	34	.1110	1 1/2	2 5/8	12003
	33	.1130	1 1/2	2 5/8	12004
	32	.1160	1 5/8	2 3/4	12005
	31	.1200	1 5/8	2 3/4	12006
1/8		.1250	1 5/8	2 3/4	12007
	30	.1285	1 5/8	2 3/4	12008
	29	.1360	1 3/4	2 7/8	12009
9/64	28	.1405	1 3/4	2 7/8	12010
		.1406	1 3/4	2 7/8	12011
	27	.1440	1 7/8	3	12012
	26	.1470	1 7/8	3	12013

\* Available While Supplies Last

Foret court

Broca Uso Multiple



List No. 1330L – Bright Finish

**STANDARD PACKAGE** Fractional Sizes  
1/32" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each  
**Wire Gage Sizes**  
#1 thru #80 — 12 each

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	25	.1495	1 7/8	3	12014
	24	.1520	2	3 1/8	12015
	23	.1540	2	3 1/8	12016
5/32		.1562	2	3 1/8	12017
	22	.1570	2	3 1/8	12018
	21	.1590	2 1/8	3 1/4	12019
	20	.1610	2 1/8	3 1/4	12020
	19	.1660	2 1/8	3 1/4	12021
	18	.1695	2 1/8	3 1/4	12022
1 1/64		.1719	2 1/8	3 1/4	12023
	17	.1730	2 3/16	3 3/8	12024
	16	.1770	2 3/16	3 3/8	12025
	15	.1800	2 3/16	3 3/8	12026
	14	.1820	2 3/16	3 3/8	12027
	13	.1850	2 5/16	3 1/2	12028
3/16		.1875	2 5/16	3 1/2	12029
	12	.1890	2 5/16	3 1/2	12030
	11	.1910	2 5/16	3 1/2	12031
	10	.1935	2 7/16	3 5/8	12032
	9	.1960	2 7/16	3 5/8	12033
	8	.1990	2 7/16	3 5/8	12034
	7	.2010	2 7/16	3 5/8	12035
1 3/64		.2031	2 7/16	3 5/8	12036
	6	.2040	2 1/2	3 3/4	12037
	5	.2055	2 1/2	3 3/4	12038
	4	.2090	2 1/2	3 3/4	12039
	3	.2130	2 1/2	3 3/4	12040
7/32		.2187	2 1/2	3 3/4	12041
	2	.2210	2 5/8	3 7/8	12042
	1	.2280	2 5/8	3 7/8	12043
1 5/64		.2344	2 5/8	3 7/8	12044
1/4		.2500	2 3/4	4	12045
1 7/64		.2656	2 7/8	4 1/8	12046
9/32		.2812	2 15/16	4 1/4	12047
1 9/64		.2969	3 1/16	4 3/8	12048
5/16		.3125	3 3/16	4 1/2	12049
2 1/64		.3281	3 5/16	4 5/8	12050
1 1/32		.3437	3 7/16	4 3/4	12051
2 3/64		.3594	3 1/2	4 7/8	12052
3/8		.3750	3 5/8	5	12053
2 5/64		.3906	3 3/4	5 1/8	12054
1 3/32		.4062	3 7/8	5 1/4	12055
2 7/64		.4219	3 15/16	5 3/8	12056
7/16		.4375	4 1/16	5 1/2	12057
2 9/64		.4531	4 3/16	5 5/8	12058
1 5/32		.4687	4 5/16	5 3/4	12059
3 1/64		.4844	4 3/8	5 7/8	12060
1/2		.5000	4 1/2	6	12061

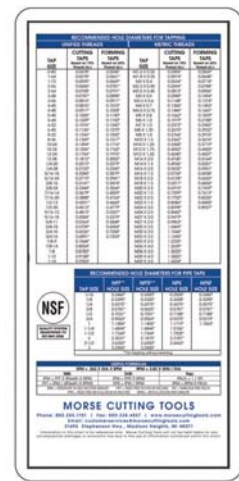
# Decimal Equivalent Pocket Chart List No. 1005

Tableau décimal      Tabla de medidas decimales

NEW LOOK! LARGER SIZE! Decimal Equivalents.  
Tap Drill Sizes for inch, metric and pipe threads.  
Size: 3 3/8" x 7", Printed on plastic

**Pack of 50**  
**EDP No. 20412**

**Pack of 100**  
**EDP No. 20413**



Front

Back

## Metric Jobber Length Drills

Straight Shank — High Speed Steel  
118° Point — Black Oxide Treated  
DIN 338 Lengths

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
.15	.0059	1.5	1/16	19	3/4	12893*
.16	.0063	1.5	1/16	19	3/4	12894*
.34	.0134	4	5/32	19	3/4	13000*
.48	.0181	5	3/16	20	25/32	12855*
.50	.0197	6	1/4	22	7/8	13004
.55	.0217	7	9/32	24	15/16	13005
.60	.0236	7	9/32	24	15/16	13006
.65	.0265	8	5/16	26	1-1/32	13007
.70	.0276	9	11/32	28	1-3/32	13008
.75	.0295	9	11/32	28	1-3/32	13009
.80	.0315	10	13/32	30	1-3/16	13010
.85	.0335	10	13/32	30	1-3/16	13011
.90	.0354	11	7/16	32	1-1/4	13012
.95	.0374	11	7/16	32	1-1/4	13013
1.00	.0394	12	15/32	34	1-11/32	13014
1.05	.0413	12	15/32	34	1-11/32	13015
1.10	.0433	14	9/16	36	1-7/16	13016
1.15	.0453	14	9/16	36	1-7/16	13017
1.20	.0472	16	5/8	38	1-1/2	13018
1.25	.0492	16	5/8	38	1-1/2	13019
1.30	.0512	16	5/8	38	1-1/2	13020
1.35	.0531	18	11/16	40	1-9/16	13021

Foret court

Broca Uso Multiple



List No. 1333

- STANDARD .15 mm thru 9.5 mm — 12 each
- PACKAGE 9.6 mm thru 13.0 mm — 6 each
- 13.5mm thru 17.5 mm — 1 each

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
1.40	.0551	18	11/16	40	1-9/16	13022
1.45	.0571	18	11/16	40	1-9/16	13023
1.50	.0591	18	11/16	40	1-9/16	13024
1.55	.0610	20	25/32	43	1-11/16	13025
1.60	.0630	20	25/32	43	1-11/16	13026
1.65	.0650	20	25/32	43	1-11/16	13027
1.70	.0669	20	25/32	43	1-11/16	13028
1.75	.0689	22	7/8	46	1-13/16	13029
1.80	.0709	22	7/8	46	1-13/16	13030
1.85	.0728	22	7/8	46	1-13/16	13031
1.90	.0748	22	7/8	46	1-13/16	13032
1.95	.0768	24	15/16	49	1-15/16	13033
2.00	.0787	24	15/16	49	1-15/16	13034
2.05	.0807	24	15/16	49	1-15/16	13035
2.10	.0827	24	15/16	49	1-15/16	13036
2.15	.0846	27	1-1/16	53	2-3/32	13037
2.20	.0866	27	1-1/16	53	2-3/32	13038
2.25	.0886	27	1-1/16	53	2-3/32	13039
2.30	.0906	27	1-1/16	53	2-3/32	13040
2.35	.0925	27	1-1/16	53	2-3/32	13041
2.40	.0945	30	1-3/16	57	2-1/4	13042
2.45	.0965	30	1-3/16	57	2-1/4	13043

\* Available While Supplies Last

(continued)

# Metric Jobber Length Drills (continued)

List No. 1333

Foret court

Broca Uso Multiple

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
2.50	.0984	30	1-3/16	57	2-1/4	<b>13044</b>
2.60	.1024	30	1-3/16	57	2-1/4	<b>13045</b>
2.70	.1063	33	1-5/16	61	2-13/32	<b>13046</b>
2.75	.1083	33	1-5/16	61	2-13/32	<b>13047</b>
2.80	.1102	33	1-5/16	61	2-13/32	<b>13048</b>
2.90	.1142	33	1-5/16	61	2-13/32	<b>13049</b>
3.00	.1181	33	1-5/16	61	2-13/32	<b>13050</b>
3.10	.1220	36	1-7/16	65	2-9/16	<b>13051</b>
3.20	.1260	36	1-7/16	65	2-9/16	<b>13052</b>
3.25	.1280	36	1-7/16	65	2-9/16	<b>13053</b>
3.30	.1299	36	1-7/16	65	2-9/16	<b>13054</b>
3.40	.1339	39	1-17/32	70	2-3/4	<b>13055</b>
3.50	.1378	39	1-17/32	70	2-3/4	<b>13056</b>
3.60	.1417	39	1-17/32	70	2-3/4	<b>13057</b>
3.70	.1457	39	1-17/32	70	2-3/4	<b>13058</b>
3.75	.1476	39	1-17/32	70	2-3/4	<b>13059</b>
3.80	.1496	43	1-11/16	75	2-15/16	<b>13060</b>
3.90	.1535	43	1-11/16	75	2-15/16	<b>13061</b>
4.00	.1575	43	1-11/16	75	2-15/16	<b>13062</b>
4.10	.1614	43	1-11/16	75	2-15/16	<b>13063</b>
4.20	.1654	43	1-11/16	75	2-15/16	<b>13064</b>
4.25	.1673	43	1-11/16	75	2-15/16	<b>13065</b>
4.30	.1693	47	1-27/32	80	3-5/32	<b>13066</b>
4.40	.1732	47	1-27/32	80	3-5/32	<b>13067</b>
4.50	.1772	47	1-27/32	80	3-5/32	<b>13068</b>
4.60	.1811	47	1-27/32	80	3-5/32	<b>13069</b>
4.70	.1850	47	1-27/32	80	3-5/32	<b>13070</b>
4.75	.1870	47	1-27/32	80	3-5/32	<b>13071</b>
4.80	.1890	52	2-1/16	86	3-3/8	<b>13072</b>
4.90	.1929	52	2-1/16	86	3-3/8	<b>13073</b>
5.00	.1968	52	2-1/16	86	3-3/8	<b>13074</b>
5.10	.2008	52	2-1/16	86	3-3/8	<b>13075</b>
5.20	.2047	52	2-1/16	86	3-3/8	<b>13076</b>
5.25	.2067	52	2-1/16	86	3-3/8	<b>13077</b>
5.30	.2087	52	2-1/16	86	3-3/8	<b>13078</b>
5.40	.2126	57	2-1/4	93	3-21/32	<b>13079</b>
5.50	.2165	57	2-1/4	93	3-21/32	<b>13080</b>
5.60	.2205	57	2-1/4	93	3-21/32	<b>13081</b>
5.70	.2244	57	2-1/4	93	3-21/32	<b>13082</b>
5.75	.2264	57	2-1/4	93	3-21/32	<b>13083</b>
5.80	.2283	57	2-1/4	93	3-21/32	<b>13084</b>
5.90	.2323	57	2-1/4	93	3-21/32	<b>13085</b>
6.00	.2362	57	2-1/4	93	3-21/32	<b>13086</b>
6.10	.2402	63	2-15/32	101	3-31/32	<b>13087</b>
6.20	.2441	63	2-15/32	101	3-31/32	<b>13088</b>
6.25	.2461	63	2-15/32	101	3-31/32	<b>13089</b>
6.30	.2480	63	2-15/32	101	3-31/32	<b>13090</b>
6.40	.2520	63	2-15/32	101	3-31/32	<b>13091</b>
6.50	.2559	63	2-15/32	101	3-31/32	<b>13092</b>
6.60	.2598	63	2-15/32	101	3-31/32	<b>13093</b>
6.70	.2638	63	2-15/32	101	3-31/32	<b>13094</b>
6.75	.2657	69	2-23/32	109	4-9/32	<b>13095</b>
6.80	.2677	69	2-23/32	109	4-9/32	<b>13096</b>
6.90	.2717	69	2-23/32	109	4-9/32	<b>13097</b>
7.00	.2756	69	2-23/32	109	4-9/32	<b>13098</b>
7.10	.2795	69	2-23/32	109	4-9/32	<b>13099</b>

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
7.20	.2835	69	2-23/32	109	4-9/32	<b>13100</b>
7.25	.2854	69	2-23/32	109	4-9/32	<b>13101</b>
7.30	.2874	69	2-23/32	109	4-9/32	<b>13102</b>
7.40	.2913	69	2-23/32	109	4-9/32	<b>13103</b>
7.50	.2953	69	2-23/32	109	4-9/32	<b>13104</b>
7.60	.2992	75	2-15/16	117	4-19/32	<b>13105</b>
7.70	.3031	75	2-15/16	117	4-19/32	<b>13106</b>
7.75	.3051	75	2-15/16	117	4-19/32	<b>13107</b>
7.80	.3071	75	2-15/16	117	4-19/32	<b>13108</b>
7.90	.3110	75	2-15/16	117	4-19/32	<b>13109</b>
8.00	.3150	75	2-15/16	117	4-19/32	<b>13110</b>
8.10	.3189	75	2-15/16	117	4-19/32	<b>13111</b>
8.20	.3228	75	2-15/16	117	4-19/32	<b>13112</b>
8.25	.3248	75	2-15/16	117	4-19/32	<b>13113</b>
8.30	.3268	75	2-15/16	117	4-19/32	<b>13114</b>
8.40	.3307	75	2-15/16	117	4-19/32	<b>13115</b>
8.50	.3346	75	2-15/16	117	4-19/32	<b>13116</b>
8.60	.3386	81	3-3/16	125	4-29/32	<b>13117</b>
8.70	.3425	81	3-3/16	125	4-29/32	<b>13118</b>
8.75	.3445	81	3-3/16	125	4-29/32	<b>13119</b>
8.80	.3465	81	3-3/16	125	4-29/32	<b>13120</b>
8.90	.3504	81	3-3/16	125	4-29/32	<b>13121</b>
9.00	.3543	81	3-3/16	125	4-29/32	<b>13122</b>
9.10	.3583	81	3-3/16	125	4-29/32	<b>13123</b>
9.20	.3622	81	3-3/16	125	4-29/32	<b>13124</b>
9.25	.3642	81	3-3/16	125	4-29/32	<b>13125</b>
9.30	.3661	81	3-3/16	125	4-29/32	<b>13126</b>
9.40	.3701	81	3-3/16	125	4-29/32	<b>13127</b>
9.50	.3740	81	3-3/16	125	4-29/32	<b>13128</b>
9.60	.3780	87	3-7/16	133	5-1/4	<b>13129</b>
9.70	.3819	87	3-7/16	133	5-1/4	<b>13130</b>
9.75	.3839	87	3-7/16	133	5-1/4	<b>13131</b>
9.80	.3898	87	3-7/16	133	5-1/4	<b>13132</b>
9.90	.3998	87	3-7/16	133	5-1/4	<b>13133</b>
10.00	.3937	87	3-7/16	133	5-1/4	<b>13134</b>
10.20	.4016	87	3-7/16	133	5-1/4	<b>12858</b>
10.30	.4055	87	3-7/16	133	5-1/4	<b>12859</b>
10.50	.4134	87	3-7/16	133	5-1/4	<b>13135</b>
10.80	.4252	94	3-11/16	142	5-19/32	<b>12863</b>
11.00	.4331	94	3-11/16	142	5-19/32	<b>13136</b>
11.20	.4409	94	3-11/16	142	5-19/32	<b>12866</b>
11.50	.4528	94	3-11/16	142	5-19/32	<b>13137</b>
11.80	.4646	94	3-11/16	142	5-19/32	<b>12871</b>
12.00	.4724	101	3-31/32	151	5-15/16	<b>13138</b>
12.20	.4803	101	3-31/32	151	5-15/16	<b>12874</b>
12.50	.4921	101	3-31/32	151	5-15/16	<b>13139</b>
13.00	.5118	101	3-31/32	151	5-15/16	<b>13140</b>
13.50	.5315	108	4-1/4	160	6-5/16	<b>12881</b>
14.00	.5512	108	4-1/4	160	6-5/16	<b>12882</b>
14.50	.5709	114	4-1/2	169	6-5/8	<b>12883</b>
15.00	.5906	114	4-1/2	169	6-5/8	<b>12884</b>
15.50	.6102	120	4-3/4	178	7	<b>12885</b>
16.00	.6299	120	4-3/4	178	7	<b>12886</b>
16.50	.6496	125	4-29/32	184	7-1/4	<b>12887</b>
17.00	.6693	125	4-29/32	184	7-1/4	<b>12888</b>
17.50	.6890	130	5-3/32	191	7-17/32	<b>12890</b>

# Low Helix & High Helix Jobber Length Drills

**Straight Shank — High Speed Steel**  
**118° Point — Bright Finish**

**Low Helix** drills are recommended for drilling brass, bronze, hard plastic and hard rubber. Wide flutes and low helix angle enhance chip ejection at high rates of penetration.

**High Helix** drills are recommended for deep hole drilling in low tensile strength materials such as aluminum, magnesium, zinc, copper, soft steels and some plastics. Wide polished flutes and a high helix angle enhance chip ejection.

Foret court

Broca Uso Multiple



List No. 1344 — Low Helix - All Sizes



List No. 1363 — High Helix-Fractional  
List No. 1364 — High Helix-Wire Gage

**STANDARD PACKAGE**

**Fractional Sizes**

1/16" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

**Wire Gage Sizes**

#1 thru #60 — 12 each

**Tool Coatings  
Also Available**

FRAC-TIONAL	SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	1344	1363, 1364
	WIRE GAGE					EDP NO.	EDP NO.
	60		.0400	1 1/16	1 5/8	14023	14172
	59		.0410	1 1/16	1 5/8	14024	14173
	58		.0420	1 1/16	1 5/8	14025	14174
	57		.0430	3/4	1 3/4	14026	14175
	56		.0465	3/4	1 3/4	14027	14176
1/16	55		.0520	7/8	1 7/8	14028	14178
	54		.0550	7/8	1 7/8	14029	14179
	53		.0595	7/8	1 7/8	14030	14180
			.0625	7/8	1 7/8	14031	14181
	52		.0635	7/8	1 7/8	14032	14182
5/64	51		.0670	1	2	14033	14183
	50		.0700	1	2	14034	14184
	49		.0730	1	2	14035	14185
	48		.0760	1	2	14036	14186
			.0781	1	2	14037	14187
	47		.0785	1	2	14038	14188
	46		.0810	1 1/8	2 1/8	14039	14189
	45		.0820	1 1/8	2 1/8	14040	14190
	44		.0860	1 1/8	2 1/8	14041	14191
	43		.0890	1 1/4	2 1/4	14042	14192
3/32	42		.0935	1 1/4	2 1/4	14043	14193
			.0937	1 1/4	2 1/4	14044	14194
	41		.0960	1 3/8	2 3/8	14045	14195
	40		.0980	1 3/8	2 3/8	14046	14196
	39		.0995	1 3/8	2 3/8	14047	14197
7/64	38		.1015	1 7/16	2 1/2	14048	14198
	37		.1040	1 7/16	2 1/2	14049	14199
	36		.1065	1 7/16	2 1/2	14050	14200
			.1094	1 1/2	2 5/8	14051	14201
	35		.1100	1 1/2	2 5/8	14052	14202
1/8	34		.1110	1 1/2	2 5/8	14053	14203
	33		.1130	1 1/2	2 5/8	14054	14204
	32		.1160	1 5/8	2 3/4	14055	14205
	31		.1200	1 5/8	2 3/4	14056	14206
			.1250	1 5/8	2 3/4	14057	14207
9/64	30		.1285	1 5/8	2 3/4	14058	14208
	29		.1360	1 3/4	2 7/8	14059	14209
	28		.1405	1 3/4	2 7/8	14060	14210
			.1406	1 3/4	2 7/8	14061	14211
	27		.1440	1 7/8	3	14062	14212

(continued)

# Low Helix & High Helix Jobber Length Drills (continued)

List Nos. 1344, 1363 and 1364

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	Foret court		Broca Uso Multiple	
						1344 EDP NO.	1363, 1364 EDP NO.	1344 EDP NO.	1363, 1364 EDP NO.
		26	.1470	1 $\frac{7}{8}$	3	14063	14213		
		25	.1495	1 $\frac{7}{8}$	3	14064	14214		
		24	.1520	2	3 $\frac{1}{8}$	14065	14215		
		23	.1540	2	3 $\frac{1}{8}$	14066	14216		
	5/32		.1562	2	3 $\frac{1}{8}$	14067	14217		
		22	.1570	2	3 $\frac{1}{8}$	14068	14218		
		21	.1590	2 $\frac{1}{8}$	3 $\frac{1}{4}$	14069	14219		
		20	.1610	2 $\frac{1}{8}$	3 $\frac{1}{4}$	14070	14220		
		19	.1660	2 $\frac{1}{8}$	3 $\frac{1}{4}$	14071	14221		
		18	.1695	2 $\frac{1}{8}$	3 $\frac{1}{4}$	14072	14222		
	11/64		.1719	2 $\frac{1}{8}$	3 $\frac{1}{4}$	14073	14223		
		17	.1730	2 $\frac{3}{16}$	3 $\frac{3}{8}$	14074	14224		
		16	.1770	2 $\frac{3}{16}$	3 $\frac{3}{8}$	14075	14225		
		15	.1800	2 $\frac{3}{16}$	3 $\frac{3}{8}$	14076	14226		
		14	.1820	2 $\frac{3}{16}$	3 $\frac{3}{8}$	14077	14227		
		13	.1850	2 $\frac{5}{16}$	3 $\frac{1}{2}$	14078	14228		
	3/16		.1875	2 $\frac{5}{16}$	3 $\frac{1}{2}$	14079	14229		
		12	.1890	2 $\frac{5}{16}$	3 $\frac{1}{2}$	14080	14230		
		11	.1910	2 $\frac{5}{16}$	3 $\frac{1}{2}$	14081	14231		
		10	.1935	2 $\frac{7}{16}$	3 $\frac{5}{8}$	14082	14232		
		9	.1960	2 $\frac{7}{16}$	3 $\frac{5}{8}$	14083	14233		
		8	.1990	2 $\frac{7}{16}$	3 $\frac{5}{8}$	14084	14234		
		7	.2010	2 $\frac{7}{16}$	3 $\frac{5}{8}$	14085	14235		
	13/64		.2031	2 $\frac{7}{16}$	3 $\frac{5}{8}$	14086	14236		
		6	.2040	2 $\frac{1}{2}$	3 $\frac{3}{4}$	14087	14237		
		5	.2055	2 $\frac{1}{2}$	3 $\frac{3}{4}$	14088	14238		
		4	.2090	2 $\frac{1}{2}$	3 $\frac{3}{4}$	14089	14239		
		3	.2130	2 $\frac{1}{2}$	3 $\frac{3}{4}$	14090	14240		
	7/32		.2187	2 $\frac{1}{2}$	3 $\frac{3}{4}$	14091	14241		
		2	.2210	2 $\frac{5}{8}$	3 $\frac{7}{8}$	14092	14242		
		1	.2280	2 $\frac{5}{8}$	3 $\frac{7}{8}$	14093	14243		
	15/64		.2344	2 $\frac{5}{8}$	3 $\frac{7}{8}$	14095	14245		
	1/4		.2500	2 $\frac{3}{4}$	4	14099	14249		
	17/64		.2656	2 $\frac{7}{8}$	4 $\frac{1}{8}$	14103	14253		
	9/32		.2812	2 $\frac{15}{16}$	4 $\frac{1}{4}$	14108	14258		
	19/64		.2969	3 $\frac{1}{16}$	4 $\frac{3}{8}$	14111	14261		
	5/16		.3125	3 $\frac{3}{16}$	4 $\frac{1}{2}$	14113	14263		
	21/64		.3281	3 $\frac{5}{16}$	4 $\frac{5}{8}$	14116	14266		
	11/32		.3437	3 $\frac{7}{16}$	4 $\frac{3}{4}$	14119	14269		
	23/64		.3593	3 $\frac{1}{2}$	4 $\frac{7}{8}$	14122	14272		
	3/8		.3750	3 $\frac{5}{8}$	5	14124	14274		
	25/64		.3906	3 $\frac{3}{4}$	5 $\frac{1}{8}$	14127	14277		
	13/32		.4062	3 $\frac{7}{8}$	5 $\frac{1}{4}$	14130	14280		
	27/64		.4219	3 $\frac{15}{16}$	5 $\frac{3}{8}$	14132	14282		
	7/16		.4375	4 $\frac{1}{16}$	5 $\frac{1}{2}$	14133	14283		
	29/64		.4531	4 $\frac{3}{16}$	5 $\frac{5}{8}$	14134	14284		
	15/32		.4687	4 $\frac{5}{16}$	5 $\frac{3}{4}$	14135	14285		
	31/64		.4844	4 $\frac{3}{8}$	5 $\frac{7}{8}$	14136	14286		
	1/2		.5000	4 $\frac{1}{2}$	6	14137	14287		

# Parabolic Flute Jobber Length Drills

**Straight Shank - High Speed Steel  
135° Split Point**

**Parabolic Flute** drills feature a unique flute design that greatly enhances chip flow, coolant flow to the drill point and heat dissipation in deep hole drilling greater than three diameters deep. Recommended for drilling aluminum and other low to medium tensile strength materials.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Enhanced hole quality at higher speeds and feeds.

135° Self-centering split point eliminates "walking" and reduces thrust.

Foret à goujure parabolique

Broca parabólica



List No. 1355 — Bright Finish



List No. 1355G — TiN Coated

**STANDARD PACKAGE** Fractional Sizes  
1/16" thru 3/8" — 12 each  
25/64" Thru 1/2" — 6 each

**Wire Gages**  
#1 thru #52 — 12 each

FRAC-TIONAL	SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	1355	1355G
	WIRE GAGE					BRIGHT EDP NO.	TIN COAT EDP NO.
1/16			.0625	7/8	1 7/8	13330	93330
		52	.0635	7/8	1 7/8	13329	93329
		51	.0670	1	2	13328	93328
		50	.0700	1	2	13327	93327
		49	.0730	1	2	13326	93326
5/64		48	.0760	1	2	13325	93325
			.0781	1	2	13331	93331
		47	.0785	1	2	13324	93324
		46	.0810	1 1/8	2 1/8	13323	93323
		45	.0820	1 1/8	2 1/8	13322	93322
		44	.0860	1 1/8	2 1/8	13321	93321
		43	.0890	1 1/4	2 1/4	13320	93320
3/32		42	.0935	1 1/4	2 1/4	13319	93319
			.0938	1 1/4	2 1/4	13332	93332
		41	.0960	1 3/8	2 3/8	13318	93318
		40	.0980	1 3/8	2 3/8	13317	93317
		39	.0995	1 3/8	2 3/8	13316	93316
7/64		38	.1015	1 7/16	2 1/2	13315	93315
		37	.1040	1 7/16	2 1/2	13314	93314
		36	.1065	1 7/16	2 1/2	13313	93313
			.1094	1 1/2	2 5/8	13333	93333
		35	.1100	1 1/2	2 5/8	13312	93312
		34	.1110	1 1/2	2 5/8	13311	93311
1/8		33	.1130	1 1/2	2 5/8	13310	93310
		32	.1160	1 5/8	2 3/4	13309	93309
		31	.1200	1 5/8	2 3/4	13308	93308
			.1250	1 5/8	2 3/4	13334	93334
		30	.1285	1 5/8	2 3/4	13307	93307
		29	.1360	1 3/4	2 7/8	13306	93306
		28	.1405	1 3/4	2 7/8	13305	93305
9/64			.1406	1 3/4	2 7/8	13335	93335
		27	.1440	1 7/8	3	13304	93304
		26	.1470	1 7/8	3	13303	93303
		25	.1495	1 7/8	3	13302	93302
		24	.1520	2	3 1/8	13301	93301
5/32		23	.1540	2	3 1/8	13300	93300
			.1562	2	3 1/8	13336	93336
		22	.1570	2	3 1/8	13299	93299
		21	.1590	2 1/8	3 1/4	13298	93298
		20	.1610	2 1/8	3 1/4	13297	93297
11/64		19	.1660	2 1/8	3 1/4	13296	93296
		18	.1695	2 1/8	3 1/4	13295	93295
			.1719	2 1/8	3 1/4	13337	93337

(continued)



# Parabolic Flute Jobber Length Drills (continued)

List Nos. 1355 and 1355G

Foret à goujure parabolique

Broca parabólica

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	1355 BRIGHT EDP NO.	1355G TIN COAT EDP NO.
		17	.1730	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	13294	93294
		16	.1770	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	13293	93293
		15	.1800	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	13292	93292
		14	.1820	2 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	13291	93291
		13	.1850	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	13290	93290
3/16			.1875	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	13338	93338
		12	.1890	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	13289	93289
		11	.1910	2 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	13288	93288
		10	.1935	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	13287	93287
		9	.1960	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	13286	93286
1/2		8	.1990	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	13285	93285
		7	.2010	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	13284	93284
13/64			.2031	2 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>	13339	93339
		6	.2040	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	13283	93283
		5	.2055	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	13282	93282
7/32		4	.2090	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	13281	93281
		3	.2130	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	13280	93280
			.2188	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	13340	93340
		2	.2210	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	13279	93279
		1	.2280	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	13278	93278
15/64			.2344	2 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	13341	93341
1/4			.2500	2 <sup>3</sup> / <sub>4</sub>	4	13342	93342
17/64			.2656	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	13343	93343
9/32			.2812	2 <sup>15</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>4</sub>	13344	93344
19/64			.2969	3 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	13345	93345
5/16			.3125	3 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	13346	93346
21/64			.3281	3 <sup>5</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	13347	93347
11/32			.3438	3 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	13348	93348
23/64			.3594	3 <sup>1</sup> / <sub>2</sub>	4 <sup>7</sup> / <sub>8</sub>	13349	93349
3/8			.3750	3 <sup>5</sup> / <sub>8</sub>	5	13350	93350
25/64			.3906	3 <sup>3</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	13351	93351
13/32			.4062	3 <sup>7</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	13352	93352
27/64			.4219	3 <sup>15</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	13353	93353
7/16			.4375	4 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	13354	93354
29/64			.4531	4 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	13355	93355
15/32			.4688	4 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	13356	93356
31/64			.4844	4 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	13357	93357
1/2			.5000	4 <sup>1</sup> / <sub>2</sub>	6	13358	93358

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

# Drill Blanks

High Speed Steel

Hardened and Ground

Made to the same length as jobber length drills. Applications include use as blanks for small cutting tools, checking hole sizes and use as punches, pins and drifts.

**Tolerance:** Up to 1/4" +0/-0.0005  
1/4" or larger +0/-0.0007

SIZE				
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	OAL	EDP NO.
	78	.0160	7/8	15454*
	77	.0180	7/8	15455*
	76	.0200	7/8	15456*
	75	.0210	1	15457*
	74	.0225	1	15458*
	73	.0240	1 1/8	15459*
	71	.0260	1 1/4	15461*
	68	.0310	1 3/8	15464*
	67	.0320	1 3/8	15466*
	66	.0330	1 3/8	15467*
	64	.0360	1 1/2	15469*
	60	.0400	1 5/8	15473
	59	.0410	1 5/8	15474
	58	.0420	1 5/8	15475
	57	.0430	1 3/4	15476
	56	.0465	1 3/4	15477
3/64		.0469	1 3/4	15478
	55	.0520	1 7/8	15479
	54	.0550	1 7/8	15480
	53	.0595	1 7/8	15481
1/16		.0625	1 7/8	15482
	52	.0635	1 7/8	15483
	51	.0670	2	15484
	50	.0700	2	15485
	49	.0730	2	15486
	48	.0760	2	15487
5/64		.0781	2	15488
	47	.0785	2	15489
	46	.0810	2 1/8	15490
	45	.0820	2 1/8	15491
	44	.0860	2 1/8	15492
	43	.0890	2 1/4	15493
	42	.0935	2 1/4	15494
3/32		.0937	2 1/4	15495
	41	.0960	2 3/8	15496
	40	.0980	2 3/8	15497
	39	.0995	2 3/8	15498
	38	.1015	2 1/2	15499
	37	.1040	2 1/2	15500
	36	.1065	2 1/2	15501
7/64		.1094	2 5/8	15502
	35	.1100	2 5/8	15503
	34	.1110	2 5/8	15504
	33	.1130	2 5/8	15505
	32	.1160	2 3/4	15506
	31	.1200	2 3/4	15507
1/8		.1250	2 3/4	15508
	30	.1285	2 3/4	15509
	29	.1360	2 7/8	15510
	28	.1405	2 7/8	15511

Foret brut

Blancos de brocas



## List No. 1439

**STANDARD PACKAGE** Fractional Sizes  
1/64" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

**Wire Gage Sizes**  
#1 thru #80 — 12 each

SIZE				
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	OAL	EDP NO.
9/64		.1406	2 7/8	15512
	27	.1440	3	15513
	26	.1470	3	15514
	25	.1495	3	15515
	24	.1520	3 1/8	15516
	23	.1540	3 1/8	15517
5/32		.1562	3 1/8	15518
	22	.1570	3 1/8	15519
	21	.1590	3 1/4	15520
	20	.1610	3 1/4	15521
	19	.1660	3 1/4	15522
	18	.1695	3 1/4	15523
1 1/64		.1719	3 1/4	15524
	17	.1730	3 3/8	15525
	16	.1770	3 3/8	15526
	15	.1800	3 3/8	15527
	14	.1820	3 3/8	15528
	13	.1850	3 1/2	15529
3/16		.1875	3 1/2	15530
	12	.1890	3 1/2	15531
	11	.1910	3 1/2	15532
	10	.1935	3 5/8	15533
	9	.1960	3 5/8	15534
	8	.1990	3 5/8	15535
	7	.2010	3 5/8	15536
13/64		.2031	3 5/8	15537
	6	.2040	3 3/4	15538
	5	.2055	3 3/4	15539
	4	.2090	3 3/4	15540
	3	.2130	3 3/4	15541
7/32		.2187	3 3/4	15542
	2	.2210	3 7/8	15543
	1	.2280	3 7/8	15544
15/64		.2344	3 7/8	15546
1/4	E	.2500	4	15550
17/64		.2656	4 1/8	15554
9/32		.2812	4 1/4	15559
19/64		.2969	4 3/8	15562
5/16		.3125	4 1/2	15564
21/64		.3281	4 5/8	15567
1 1/32		.3437	4 3/4	15570
23/64		.3594	4 7/8	15573
3/8		.3750	5	15575
25/64		.3906	5 1/8	15578
	Y	.4040	5 1/4	15580*
		.4062	5 1/4	15581
13/32	Z	.4130	5 1/4	15582*
		.4219	5 3/8	15583
27/64		.4375	5 1/2	15584
7/16		.4531	5 5/8	15585
29/64		.4687	5 3/4	15586
15/32		.4844	5 7/8	15587
31/64		.5000	6	15588
1/2				

\*Available While Supplies Last

# Metric – Cobalt – Aircraft Type J Jobber Length Drills

Foret au cobalt

Broca de cobalto



## Straight Shank – Cobalt 135° Split Point – Heavy Duty

\*Sizes 1.5mm and smaller furnished with 135° regular point.

Heavy duty construction. Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials that generate higher cutting temperatures including high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

## List No. 2345 NAS-907, Type J

**STANDARD PACKAGE** .90 mm thru 9.5 mm – 12 each  
9.6 mm thru 13.0 mm – 6 each

135° Self-centering split point eliminates “walking” and reduces thrust.

Metric						Imperial							
SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.	SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.				MM	IN.	MM	IN.	
.90	.0354	16	5/8	38	1 1/2	17600*	5.80	.2283	67	2 5/8	98	3 7/8	17652
.95	.0374	16	5/8	38	1 1/2	17601*	5.90	.2323	67	2 5/8	98	3 7/8	17653
1.00	.0394	17	11/16	41	1 5/8	17602*	6.00	.2362	70	2 3/4	102	4	17654
1.05	.0413	17	11/16	41	1 5/8	17603*	6.10	.2402	70	2 3/4	102	4	17655
1.10	.0433	19	3/4	44	1 3/4	17604*	6.20	.2441	70	2 3/4	102	4	17656
1.20	.0472	22	7/8	48	1 7/8	17605*	6.30	.2480	70	2 3/4	102	4	17657
1.30	.0512	22	7/8	48	1 7/8	17606*	6.40	.2520	73	2 7/8	105	4 1/8	17658
1.40	.0551	22	7/8	48	1 7/8	17607*	6.50	.2559	73	2 7/8	105	4 1/8	17659
1.50	.0591	22	7/8	48	1 7/8	17608*	6.60	.2598	73	2 7/8	105	4 1/8	17660
1.60	.0630	22	7/8	48	1 7/8	17609	6.70	.2638	73	2 7/8	105	4 1/8	17661
1.70	.0669	25	1	51	2	17610	6.80	.2677	73	2 7/8	105	4 1/8	17662
1.80	.0709	25	1	51	2	17611	6.90	.2717	73	2 7/8	105	4 1/8	17663
1.90	.0748	25	1	51	2	17612	7.00	.2756	73	2 7/8	105	4 1/8	17664
2.00	.0787	25	1	51	2	17613	7.10	.2795	75	2 61/64	108	4 1/4	17665
2.05	.0807	29	1 5/32	54	2 1/8	17614	7.20	.2835	75	2 61/64	108	4 1/4	17666
2.10	.0827	29	1 5/32	54	2 1/8	17615	7.30	.2874	75	2 61/64	108	4 1/4	17667
2.20	.0866	32	1 1/4	57	2 1/4	17616	7.40	.2913	78	3	111	4 3/8	17668
2.30	.0906	32	1 1/4	57	2 1/4	17617	7.50	.2953	78	3	111	4 3/8	17669
2.40	.0945	35	1 3/8	60	2 23/64	17618	7.60	.2992	78	3	111	4 3/8	17670
2.50	.0984	35	1 3/8	60	2 23/64	17619	7.70	.3031	81	3 3/16	114	4 1/2	17671
2.60	.1024	37	1 15/32	64	2 1/2	17620	7.80	.3071	81	3 3/16	114	4 1/2	17672
2.70	.1063	37	1 15/32	64	2 1/2	17621	7.90	.3110	81	3 3/16	114	4 1/2	17673
2.80	.1102	38	1 1/2	67	2 5/8	17622	8.00	.3150	81	3 3/16	114	4 1/2	17674
2.90	.1142	41	1 5/8	70	2 3/4	17623	8.10	.3189	84	3 5/16	117	4 9/16	17675
3.00	.1181	41	1 5/8	70	2 3/4	17624	8.20	.3228	84	3 5/16	117	4 9/16	17676
3.10	.1220	41	1 5/8	70	2 3/4	17625	8.30	.3268	84	3 5/16	117	4 9/16	17677
3.20	.1260	41	1 5/8	70	2 3/4	17626	8.40	.3307	87	3 27/64	121	4 3/4	17678
3.30	.1299	45	1 3/4	73	2 7/8	17627	8.50	.3346	87	3 27/64	121	4 3/4	17679
3.40	.1339	45	1 3/4	73	2 7/8	17628	8.60	.3386	87	3 27/64	121	4 3/4	17680
3.50	.1378	45	1 3/4	73	2 7/8	17629	8.70	.3425	87	3 27/64	121	4 3/4	17681
3.60	.1417	48	1 7/8	76	3	17630	8.80	.3465	89	3 1/2	124	4 7/8	17682
3.70	.1457	48	1 7/8	76	3	17631	8.90	.3504	89	3 1/2	124	4 7/8	17683
3.80	.1496	48	1 7/8	76	3	17632	9.00	.3543	89	3 1/2	124	4 7/8	17684
3.90	.1535	51	2	79	3 1/8	17633	9.10	.3583	89	3 1/2	124	4 7/8	17685
4.00	.1575	54	2 1/8	83	3 1/4	17634	9.20	.3622	92	3 5/8	127	5	17686
4.10	.1614	54	2 1/8	83	3 1/4	17635	9.30	.3661	92	3 5/8	127	5	17687
4.20	.1654	54	2 1/8	83	3 1/4	17636	9.40	.3701	92	3 5/8	127	5	17688
4.30	.1693	54	2 1/8	83	3 1/4	17637	9.50	.3740	92	3 5/8	127	5	17689
4.40	.1732	56	2 13/64	86	3 3/8	17638	9.60	.3780	95	3 3/4	130	5 1/8	17690
4.50	.1772	56	2 13/64	86	3 3/8	17639	9.70	.3819	95	3 3/4	130	5 1/8	17691
4.60	.1811	56	2 13/64	86	3 3/8	17640	9.80	.3858	95	3 3/4	130	5 1/8	17692
4.70	.1850	59	2 21/64	89	3 1/2	17641	10.00	.3937	95	3 3/4	130	5 1/8	17693
4.80	.1890	59	2 21/64	89	3 1/2	17642	10.20	.4016	98	3 55/64	133	5 1/4	17694
4.90	.1929	62	2 7/16	92	3 5/8	17643	10.50	.4134	98	3 55/64	133	5 1/4	17695
5.00	.1969	62	2 7/16	92	3 5/8	17644	10.80	.4252	103	4 1/16	140	5 1/2	17696
5.10	.2008	62	2 7/16	92	3 5/8	17645	11.00	.4331	103	4 1/16	140	5 1/2	17697
5.20	.2047	64	2 1/2	95	3 3/4	17646	11.20	.4409	106	4 7/32	143	5 5/8	17698
5.30	.2087	64	2 1/2	95	3 3/4	17647	11.50	.4528	106	4 7/32	143	5 5/8	17699
5.40	.2126	64	2 1/2	95	3 3/4	17648	11.80	.4646	110	4 11/32	146	5 3/4	17700
5.50	.2165	64	2 1/2	95	3 3/4	17649	12.00	.4724	111	4 3/8	149	5 7/8	17701
5.60	.2205	67	2 5/8	98	3 7/8	17650	12.20	.4803	111	4 3/8	149	5 7/8	17702
5.70	.2244	67	2 5/8	98	3 7/8	17651	12.50	.4921	114	4 1/2	152	6	17703
							13.00	.5118	114	4 1/2	152	6	17704

# Cobalt — Aircraft Type J Jobber Length Drills

**Straight Shank — 135° Split Point — Heavy Duty**

Heavy duty construction. Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials that generate higher cutting temperatures including high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

Self-centering split point eliminates "walking" and reduces thrust.

**STANDARD PACKAGE**

**Fractional Sizes**

3/64" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

**Letter Sizes**

A thru V — 12 each  
W thru Z — 6 each

**Wire Gage Sizes**

#1 thru #60 — 12 each

SIZE	FRAC-TIONAL	WIRE LETTER	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED EDP NO.	ALTiN EDP NO.
		60	.0400	11/16	1-5/8		17101*	93750*
		59	.0410	11/16	1-5/8		17102*	93751*
		58	.0420	11/16	1-5/8		17103*	93752*
		57	.0430	3/4	1-3/4		17104*	93753*
		56	.0465	3/4	1-3/4		17105*	93754*
3/64			.0469	3/4	1-3/4		17106*	93864*
		55	.0520	7/8	1-7/8		17107*	93755*
		54	.0550	7/8	1-7/8		17108*	93756*
		53	.0595	7/8	1-7/8		17109*	93757*
1/16			.0625	7/8	1-7/8		17110	93758
		52	.0635	7/8	1-7/8		17111	93759
		51	.0670	1	2		17112	93760
		50	.0700	1	2		17113	93761
		49	.0730	1	2		17114	93762
		48	.0760	1	2		17115	93763
5/64			.0781	1	2		17116	93764
		47	.0785	1	2		17117	93765
		46	.0810	1-1/8	2-1/8		17118	93766
		45	.0820	1-1/8	2-1/8		17119	93767
		44	.0860	1-1/8	2-1/8		17120	93768
		43	.0890	1-1/4	2-1/4		17121	93769
		42	.0935	1-1/4	2-1/4		17122	93770
			.0937	1-1/4	2-1/4		17123	93771
		41	.0960	1-3/8	2-3/8		17124	93772
		40	.0980	1-3/8	2-3/8		17125	93773
		39	.0995	1-3/8	2-3/8		17126	93774
		38	.1015	1-7/16	2-1/2		17127	93775
		37	.1040	1-7/16	2-1/2		17128	93776
		36	.1065	1-7/16	2-1/2		17129	93777
7/64			.1094	1-1/2	2-5/8		17130	93778
		35	.1100	1-1/2	2-5/8		17131	93779
		34	.1110	1-1/2	2-5/8		17132	93780
		33	.1130	1-1/2	2-5/8		17133	93781
		32	.1160	1-5/8	2-3/4		17134	93782
		31	.1200	1-5/8	2-3/4		17135	93783
1/8			.1250	1-5/8	2-3/4		17136	93784
		30	.1285	1-5/8	2-3/4		17137	93785
		29	.1360	1-3/4	2-7/8		17138	93786
		28	.1405	1-3/4	2-7/8		17139	93787
9/64			.1406	1-3/4	2-7/8		17140	93788
		27	.1440	1-7/8	3		17141	93789
		26	.1470	1-7/8	3		17142	93790
		25	.1495	1-7/8	3		17143	93791
		24	.1520	2	3-1/8		17144	93792
		23	.1540	2	3-1/8		17145	93793

\*Sizes #53 and smaller furnished with 135° Regular Point

Foret au cobalt

Broca de cobalto



**Uncoated - NAS-907, Type J**

- List No. 2330 Fractional
- List No. 2332 Letter
- List No. 2340 Wire Gage



**ALTiN Coated - NAS-907, Type J**

- List No. 2330T Fractional
- List No. 2332T Letter
- List No. 2340T Wire Gage

ALTiN - Aluminum Titanium Nitride - Increases wear & heat resistance, improves chip flow & resists chip welding.

SIZE	FRAC-TIONAL	WIRE LETTER	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED EDP NO.	ALTiN EDP NO.
5/32				.1562	2	3-1/8	17146	93794
			22	.1570	2	3-1/8	17147	93795
			21	.1590	2-1/8	3-1/4	17148	93796
			20	.1610	2-1/8	3-1/4	17149	93797
			19	.1660	2-1/8	3-1/4	17150	93798
			18	.1695	2-1/8	3-1/4	17151	93799
11/64				.1719	2-1/8	3-1/4	17152	93800
			17	.1730	2-3/16	3-3/8	17153	93801
			16	.1770	2-3/16	3-3/8	17154	93802
			15	.1800	2-3/16	3-3/8	17155	93803
			14	.1820	2-3/16	3-3/8	17156	93804
			13	.1850	2-5/16	3-1/2	17157	93805
				.1875	2-5/16	3-1/2	17158	93806
3/16				.1890	2-5/16	3-1/2	17159	93807
			12	.1890	2-5/16	3-1/2	17159	93807
			11	.1910	2-5/16	3-1/2	17160	93808
			10	.1935	2-7/16	3-5/8	17161	93809
			9	.1960	2-7/16	3-5/8	17162	93810
			8	.1990	2-7/16	3-5/8	17163	93811
			7	.2010	2-7/16	3-5/8	17164	93812
13/64				.2031	2-7/16	3-5/8	17165	93813
			6	.2040	2-1/2	3-3/4	17166	93814
			5	.2055	2-1/2	3-3/4	17167	93815
			4	.2090	2-1/2	3-3/4	17168	93816
			3	.2130	2-1/2	3-3/4	17169	93817
7/32				.2187	2-1/2	3-3/4	17170	93818
			2	.2210	2-5/8	3-7/8	17171	93819
			1	.2280	2-5/8	3-7/8	17172	93820
15/64	A			.2340	2-5/8	3-7/8	17173	93821
				.2344	2-5/8	3-7/8	17174	93822
	B			.2380	2-3/4	4	17175	93823
	C			.2420	2-3/4	4	17176	93824
	D			.2460	2-3/4	4	17177	93825
1/4	E			.2500	2-3/4	4	17178	93826
	F			.2570	2-7/8	4-1/8	17180	93827
	G			.2610	2-7/8	4-1/8	17181	93828
17/64				.2656	2-7/8	4-1/8	17182	93829
	H			.2660	2-7/8	4-1/8	17183	93830
	I			.2720	2-7/8	4-1/8	17184	93831
	J			.2770	2-7/8	4-1/8	17185	93832
	K			.2810	2-15/16	4-1/4	17186	93833
9/32				.2812	2-15/16	4-1/4	17187	93834
	L			.2900	2-15/16	4-1/4	17188	93835
	M			.2950	3-1/16	4-3/8	17189	93836
19/64				.2969	3-1/16	4-3/8	17190	93837
	N			.3020	3-1/16	4-3/8	17191	93838

(continued)

# Cobalt — Jobber Length Drills (continued)

SIZE		WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED	ALTiN
FRAC-TIONAL	LETTER					EDP NO.	EDP NO.
5/16	O	.3125	3-3/16	4-1/2	<b>17192</b>	<b>93839</b>	
		.3160	3-3/16	4-1/2	<b>17193</b>	<b>93840</b>	
	P	.3230	3-5/16	4-5/8	<b>17194</b>	<b>93841</b>	
21/64	Q	.3281	3-5/16	4-5/8	<b>17195</b>	<b>93842</b>	
		.3320	3-7/16	4-3/4	<b>17196</b>	<b>93843</b>	
11/32	R	.3390	3-7/16	4-3/4	<b>17197</b>	<b>93844</b>	
	S	.3437	3-7/16	4-3/4	<b>17198</b>	<b>93845</b>	
		.3480	3-1/2	4-7/8	<b>17199</b>	<b>93846</b>	
23/64	T	.3580	3-1/2	4-7/8	<b>17200</b>	<b>93847</b>	
	U	.3594	3-1/2	4-7/8	<b>17201</b>	<b>93848</b>	
3/8	V	.3680	3-5/8	5	<b>17202</b>	<b>93849</b>	
		.3750	3-5/8	5	<b>17203</b>	<b>93850</b>	
	V	.3770	3-5/8	5	<b>17204</b>	<b>93851</b>	

SIZE		WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED	ALTiN
FRAC-TIONAL	LETTER					EDP NO.	EDP NO.
25/64	W	.3860	3-3/4	5-1/8	<b>17205</b>	<b>93852</b>	
		.3906	3-3/4	5-1/8	<b>17206</b>	<b>93853</b>	
	X	.3970	3-3/4	5-1/8	<b>17207</b>	<b>93854</b>	
13/32	Y	.4040	3-7/8	5-1/4	<b>17208</b>	<b>93855</b>	
		.4062	3-7/8	5-1/4	<b>17209</b>	<b>93856</b>	
27/64	Z	.4130	3-7/8	5-1/4	<b>17210</b>	<b>93857</b>	
		.4219	3-15/16	5-3/8	<b>17211</b>	<b>93858</b>	
	7/16	.4375	4-1/16	5-1/2	<b>17212</b>	<b>93859</b>	
29/64	.4531	4-3/16	5-5/8	<b>17213</b>	<b>93860</b>		
15/32	.4688	4-5/16	5-3/4	<b>17214</b>	<b>93861</b>		
31/64	.4844	4-3/8	5-7/8	<b>17215</b>	<b>93862</b>		
1/2	.5000	4-1/2	6	<b>17216</b>	<b>93863</b>		

## Carbide Tipped Jobber Length Drills

Excellent wear resistance. Recommended for drilling cast iron, non-ferrous metals, composites, hard plastics, fiberglass and other abrasive non-ferrous materials.

**NOT FOR USE IN STEEL.**

SIZE		WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	LETTER					EDP NO.
1/8		.1250	1 5/8	2 3/4	<b>50358</b>	
		30	.1285	1 5/8	2 3/4	<b>50359*</b>
		29	.1360	1 3/4	2 7/8	<b>50360*</b>
	28	.1405	1 3/4	2 7/8	<b>50361*</b>	
9/64		.1406	1 3/4	2 7/8	<b>50362</b>	
		26	.1470	1 7/8	3	<b>50364*</b>
		25	.1495	1 7/8	3	<b>50365*</b>
		24	.1520	2	3 1/8	<b>50366*</b>
		23	.1540	2	3 1/8	<b>50367*</b>
5/32		.1562	2	3 1/8	<b>50368</b>	
		22	.1570	2	3 1/8	<b>50369*</b>
		20	.1610	2 1/8	3 1/4	<b>50371*</b>
1 1/64		.1719	2 1/8	3 1/4	<b>50374</b>	
		16	.1770	2 3/16	3 3/8	<b>50376*</b>
		15	.1800	2 3/16	3 3/8	<b>50377*</b>
		13	.1850	2 5/16	3 1/2	<b>50379*</b>
3/16		.1875	2 5/16	3 1/2	<b>50380</b>	
		12	.1890	2 5/16	3 1/2	<b>50381*</b>
		10	.1935	2 7/16	3 5/8	<b>50383*</b>
1 3/64		.2031	2 7/16	3 5/8	<b>50387</b>	
		6	.2040	2 1/2	3 3/4	<b>50388*</b>
		4	.2090	2 1/2	3 3/4	<b>50390*</b>
		3	.2130	2 1/2	3 3/4	<b>50391*</b>
7/32		.2187	2 1/2	3 3/4	<b>50392</b>	
		2	.2210	2 5/8	3 7/8	<b>50393*</b>
1 5/64	A	.2340	2 5/8	3 7/8	<b>50395*</b>	
		.2344	2 5/8	3 7/8	<b>50396</b>	
		.2380	2 3/4	4	<b>50397*</b>	
		.2420	2 3/4	4	<b>50398*</b>	
1/4	D	.2460	2 3/4	4	<b>50399*</b>	
		.2500	2 3/4	4	<b>50401</b>	
1 7/64	E	.2656	2 7/8	4 1/8	<b>50404</b>	

Foret à pointe au carbure Broca con punta de carburo



List No. 5330

118° Point

STANDARD PACKAGE All sizes — 1 each

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	LETTER				EDP NO.
9/32	J	.2770	2 7/8	4 1/8	<b>50407*</b>
		.2810	2 15/16	4 1/4	<b>50408*</b>
	.2812	2 15/16	4 1/4	<b>50409</b>	
	L	.2900	2 15/16	4 1/4	<b>50410*</b>
1 9/64	M	.2950	3 1/16	4 3/8	<b>50411*</b>
		.2969	3 1/16	4 3/8	<b>50412</b>
5/16	N	.3020	3 1/16	4 3/8	<b>50413*</b>
		.3125	3 3/16	4 1/2	<b>50414</b>
		.3281	3 5/16	4 5/8	<b>50417</b>
2 1/64	Q	.3320	3 7/16	4 3/4	<b>50418*</b>
		.3390	3 7/16	4 3/4	<b>50419*</b>
1 1/32	R	.3437	3 7/16	4 3/4	<b>50420</b>
		.3480	3 1/2	4 7/8	<b>50421*</b>
	T	.3580	3 1/2	4 7/8	<b>50422*</b>
2 3/64	S	.3594	3 1/2	4 7/8	<b>50423</b>
		.3750	3 5/8	5	<b>50425</b>
3/8	V	.3770	3 5/8	5	<b>50426*</b>
		.3860	3 3/4	5 1/8	<b>50427*</b>
		.3906	3 3/4	5 1/8	<b>50428</b>
2 5/64	W	.3970	3 3/4	5 1/8	<b>50429*</b>
		.4040	3 3/8	5 1/4	<b>50430*</b>
1 3/32	Y	.4062	3 3/8	5 1/4	<b>50431</b>
		.4130	3 3/8	5 1/4	<b>50432*</b>
2 7/64	Z	.4219	3 15/16	5 3/8	<b>50433</b>
		.4375	4 1/16	5 1/2	<b>50434</b>
2 9/64		.4531	4 3/16	5 5/8	<b>50435</b>
		.4687	4 5/16	5 3/4	<b>50436</b>
1 5/32	.4844	4 3/8	5 7/8	<b>50437</b>	
1/2	.5000	4 1/2	6	<b>50438</b>	

\* Available While Supplies Last

# Solid Carbide Screw Machine Length Drills

## For Tough Drilling Applications

Recommended for tough drilling applications including carbon steel, stainless steel, cast iron, inconel, titanium, high temperature alloy steel, tool steel, work hardened and gummy materials and other high strength ferrous materials.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

135° Self-centering split point eliminates "walking" and reduces thrust.

Foret au carbure

Broca de carburo



List No. 5375 - Uncoated

List No. 5375T - TiAlN Coated

**135° Point – 15° Helix Angle**  
Split Point on sizes 3/32" and larger.

**TOLERANCES**

All sizes +.0000/- .0005

**STANDARD PACKAGE**

All sizes — 1 each

**Speeds & Feeds: Page 83**

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5375 UNCOATED		5375T TiAlN	
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/32	.0312	1/2	1-1/2	50860	92230		
1.0 mm	.0394	13 mm	38 mm	54825	93005		
#60	.0400	1/2	1-1/2	54826	93006		
#59	.0410	1/2	1-1/2	54827	93007		
#58	.0420	1/2	1-1/2	54828	93008		
#57	.0430	1/2	1-1/2	54829	93009		
56	.0465	1/2	1-1/2	50861	92231		
3/64	.0469	1/2	1-1/2	50862	92232		
55	.0520	1/2	1-1/2	50863	92233		
54	.0550	1/2	1-1/2	50864	92234		
1.5 mm	.0591	13 mm	38 mm	54830	93010		
53	.0595	1/2	1-1/2	50865	92235		
1/16	.0625	5/8	1-5/8	50866	92236		
52	.0635	11/16	1-11/16	50867	92237		
51	.0670	11/16	1-11/16	50868	92238		
50	.0700	11/16	1-11/16	50869	92239		
49	.0730	11/16	1-11/16	50870	92240		
48	.0760	11/16	1-11/16	50871	92241		
5/64	.0781	11/16	1-11/16	50872	92242		
47	.0785	3/4	1-3/4	50873	92243		
2.0 mm	.0787	19 mm	45 mm	54831	93011		
46	.0810	3/4	1-3/4	50874	92244		
45	.0820	3/4	1-3/4	50875	92245		
44	.0860	3/4	1-3/4	50876	92246		
43	.0890	3/4	1-3/4	50877	92247		
42	.0935	3/4	1-3/4	50878	92248		
3/32	.0938	3/4	1-3/4	50879	92249		
41	.0960	13/16	1-13/16	50880	92250		
40	.0980	13/16	1-13/16	50881	92251		
2.5 mm	.0984	21 mm	46 mm	54832	93012		
39	.0995	13/16	1-13/16	50882	92252		
38	.1015	13/16	1-13/16	50883	92253		
37	.1040	13/16	1-13/16	50884	92254		
36	.1065	13/16	1-13/16	50885	92255		
7/64	.1094	13/16	1-13/16	50886	92256		
35	.1100	7/8	1-7/8	50887	92257		
34	.1110	7/8	1-7/8	50888	92258		

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5375 UNCOATED		5375T TiAlN	
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
33	.1130	7/8	1-7/8	50889	92259		
32	.1160	7/8	1-7/8	50890	92260		
3.0 mm	.1181	22 mm	48 mm	54833	93013		
31	.1200	7/8	1-7/8	50891	92261		
1/8	.1250	7/8	1-7/8	50892	92262		
30	.1285	15/16	1-15/16	50893	92263		
29	.1360	15/16	1-15/16	50894	92264		
3.5 mm	.1378	24 mm	49 mm	54834	93014		
28	.1405	15/16	1-15/16	50895	92265		
9/64	.1406	15/16	1-15/16	50896	92266		
27	.1440	1	2-1/16	50897	92267		
26	.1470	1	2-1/16	50898	92268		
25	.1495	1	2-1/16	50899	92269		
24	.1520	1	2-1/16	50900	92270		
23	.1540	1	2-1/16	50901	92271		
5/32	.1562	1	2-1/16	50902	92272		
22	.1570	1-1/16	2-1/8	50903	92273		
4.0 mm	.1575	27 mm	54 mm	54835	93015		
21	.1590	1-1/16	2-1/8	50904	92274		
20	.1610	1-1/16	2-1/8	50905	92275		
19	.1660	1-1/16	2-1/8	50906	92276		
18	.1695	1-1/16	2-1/8	50907	92277		
11/64	.1719	1-1/16	2-1/8	50908	92278		
17	.1730	1-1/8	2-3/16	50909	92279		
16	.1770	1-1/8	2-3/16	50910	92280		
4.5 mm	.1772	29 mm	56 mm	54836	93016		
15	.1800	1-1/8	2-3/16	50911	92281		
14	.1820	1-1/8	2-3/16	50912	92282		
13	.1850	1-1/8	2-3/16	50913	92283		
3/16	.1875	1-1/8	2-3/16	50914	92284		
12	.1890	1-3/16	2-1/4	50915	92285		
11	.1910	1-3/16	2-1/4	50916	92286		
10	.1935	1-3/16	2-1/4	50917	92287		
9	.1960	1-3/16	2-1/4	50918	92288		
5.0 mm	.1969	30 mm	57 mm	54837	93017		
8	.1990	1-3/16	2-1/4	50919	92289		

**Tool Coatings Also Available**

(continued)

# Solid Carbide Screw Machine Length Drills

## For Tough Drilling Applications

Recommended for tough drilling applications including carbon steel, stainless steel, cast iron, inconel, titanium, high temperature alloy steel, tool steel, work hardened and gummy materials and other high strength ferrous materials.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

135° Self-centering split point eliminates "walking" and reduces thrust.

(continued)

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5375 UNCOATED		5375T TiAlN	
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
7	.2010	1-3/16	2-1/4	50920	92290		
<b>13/64</b>	.2031	1-3/16	2-1/4	50921	92291		
6	.2040	1-1/4	2-3/8	50922	92292		
5	.2055	1-1/4	2-3/8	50923	92293		
4	.2090	1-1/4	2-3/8	50924	92294		
3	.2130	1-1/4	2-3/8	50925	92295		
5.5 mm	.2165	32 mm	60 mm	54838	93018		
<b>7/32</b>	.2188	1-1/4	2-3/8	50926	92296		
2	.2210	1-5/16	2-7/16	50927	92297		
1	.2280	1-5/16	2-7/16	50928	92298		
A	.2340	1-5/16	2-7/16	50929	92299		
<b>15/64</b>	.2344	1-5/16	2-7/16	50930	92300		
6.0 mm	.2362	33 mm	62 mm	54839	93019		
B	.2380	1-3/8	2-1/2	50931	92301		
C	.2420	1-3/8	2-1/2	50932	92302		
D	.2460	1-3/8	2-1/2	50933	92303		
<b>1/4 (E)</b>	.2500	1-3/8	2-1/2	50934	92304		
6.5 mm	.2559	35 mm	64 mm	54840	93020		
F	.2570	1-7/16	2-5/8	50935	92305		
G	.2610	1-7/16	2-5/8	50936	92306		
<b>17/64</b>	.2656	1-7/16	2-5/8	50937	92307		
H	.2660	1-1/2	2-11/16	50938	92308		
I	.2720	1-1/2	2-11/16	50939	92309		
7.0 mm	.2756	38 mm	68 mm	54841	93021		
J	.2770	1-1/2	2-11/16	50940	92310		
K	.2810	1-1/2	2-11/16	50941	92311		
<b>9/32</b>	.2812	1-1/2	2-11/16	50942	92312		
L	.2900	1-9/16	2-3/4	50943	92313		
M	.2950	1-9/16	2-3/4	50944	92314		
7.5 mm	.2953	40 mm	70 mm	54842	93022		
<b>19/64</b>	.2969	1-9/16	2-3/4	50945	92315		
N	.3020	1-5/8	2-13/16	50946	92316		
<b>5/16</b>	.3125	1-5/8	2-13/16	50947	92317		
8.0 mm	.3150	41 mm	72 mm	54843	93023		
O	.3160	1-11/16	2-15/16	50948	92318		
P	.3230	1-11/16	2-15/16	50949	92319		
<b>21/64</b>	.3281	1-11/16	2-15/16	50950	92320		

Foret au carbure

Broca de carburo



List No. 5375 - Uncoated

List No. 5375T - TiAlN Coated

135° Point - 15° Helix Angle  
Split Point on sizes 3/32" and larger.

### TOLERANCES

All sizes +.0000/-0.0005

### STANDARD PACKAGE

All sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5375 UNCOATED		5375T TiAlN	
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
Q	.3320	1-11/16	3	50951	92321		
8.5 mm	.3346	43 mm	76 mm	54844	93024		
R	.3390	1-11/16	3	50952	92322		
<b>11/32</b>	.3438	1-11/16	3	50953	92323		
S	.3480	1-3/4	3-1/16	50954	92324		
9.0 mm	.3543	45 mm	78 mm	54845	93025		
T	.3580	1-3/4	3-1/16	50955	92325		
<b>23/64</b>	.3594	1-3/4	3-1/16	50956	92326		
U	.3680	1-13/16	3-1/8	50957	92327		
9.5 mm	.3740	46 mm	79 mm	54846	93026		
<b>3/8</b>	.3750	1-13/16	3-1/8	50958	92328		
V	.3770	1-7/8	3-1/4	50959	92329		
W	.3860	1-7/8	3-1/4	50960	92330		
<b>25/64</b>	.3906	1-7/8	3-1/4	50961	92331		
10.0 mm	.3937	48 mm	83 mm	54847	93027		
X	.3970	1-15/16	3-5/16	50962	92332		
Y	.4040	1-15/16	3-5/16	50963	92333		
<b>13/32</b>	.4062	1-15/16	3-5/16	50964	92334		
Z	.4130	2	3-3/8	50965	92335		
10.5 mm	.4134	51 mm	86 mm	54848	93028		
<b>27/64</b>	.4219	2	3-3/8	50966	92336		
11.0 mm	.4331	51 mm	86 mm	54849	93029		
<b>7/16</b>	.4375	2-1/16	3-7/16	50967	92337		
11.5 mm	.4528	52 mm	88 mm	54850	93030		
<b>29/64</b>	.4531	2-1/8	3-9/16	50968	92338		
<b>15/32</b>	.4688	2-1/8	3-5/8	50969	92339		
12.0 mm	.4724	54 mm	92 mm	54851	93031		
<b>31/64</b>	.4844	2-3/16	3-11/16	50970	92340		
12.5 mm	.4921	56 mm	94 mm	54852	93032		
<b>1/2</b>	.5000	2-1/4	3-3/4	50971	92341		
<b>33/64</b>	.5156	2-3/8	3-7/8	54853	93033		
<b>17/32</b>	.5312	2-3/8	3-7/8	54854	93034		
<b>35/64</b>	.5469	2-3/8	3-7/8	54855	93035		
<b>9/16</b>	.5625	2-1/2	4	54856	93036		
<b>5/8</b>	.6250	2-3/4	4-1/4	54857	93037		
<b>11/16</b>	.6875	3	4-5/8	54858	93038		
<b>3/4</b>	.7500	3-1/8	5	54859	93039		

Tool Coatings Also Available

# Solid Carbide Standard Length Drills

Recommended for drilling cast iron, non ferrous alloys, plastics, aluminum and other easily machined materials.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding.

**Speeds & Feeds: Page 83**

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5374 UNCOATED EDP NO.	5374T TiAlN EDP NO.
80	.0135	3/16	1-1/4	<b>51000</b>	—
79	.0145	3/16	1-1/4	<b>51001</b>	—
<b>1/64</b>	.0156	3/16	1-1/4	<b>51002</b>	—
78	.0160	3/16	1-1/4	<b>51003</b>	—
77	.0180	3/16	1-1/4	<b>51004</b>	—
76	.0200	1/4	1-1/4	<b>51005</b>	—
75	.0210	1/4	1-1/4	<b>51006</b>	—
74	.0225	1/4	1-1/4	<b>51007</b>	—
73	.0240	1/4	1-1/4	<b>51008</b>	—
72	.0250	5/16	1-1/4	<b>51009</b>	—
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71	.0260	5/16	1-1/4	<b>51010</b>	—
70	.0280	5/16	1-1/4	<b>51011</b>	—
69	.0292	5/16	1-1/4	<b>51012</b>	—
68	.0310	5/16	1-1/4	<b>51013</b>	—
<b>1/32</b>	.0312	5/16	1-1/4	<b>51014</b>	<b>92090</b>
67	.0320	5/16	1-1/4	<b>51015</b>	—
66	.0330	5/16	1-1/4	<b>51016</b>	—
65	.0350	5/8	1-3/8	<b>51017</b>	—
64	.0360	5/8	1-3/8	<b>51018</b>	—
63	.0370	5/8	1-3/8	<b>51019</b>	—
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62	.0380	5/8	1-3/8	<b>51020</b>	—
61	.0390	5/8	1-3/8	<b>51021</b>	—
1.00 mm	.0394	5/8	1-1/2	<b>51022</b>	<b>92091</b>
60	.0400	3/4	1-1/2	<b>51023</b>	—
59	.0410	3/4	1-1/2	<b>51024</b>	—
58	.0420	3/4	1-1/2	<b>51025</b>	—
57	.0430	3/4	1-1/2	<b>51026</b>	—
56	.0465	3/4	1-1/2	<b>51027</b>	<b>92092</b>
<b>3/64</b>	.0469	3/4	1-1/2	<b>51028</b>	<b>92093</b>
55	.0520	3/4	1-1/2	<b>51029</b>	<b>92094</b>
<hr/>					
54	.0550	3/4	1-1/2	<b>51030</b>	<b>92095</b>
1.50 mm	.0591	3/4	1-1/2	<b>50977</b>	<b>92096</b>
53	.0595	3/4	1-1/2	<b>51031</b>	<b>92097</b>
<b>1/16</b>	.0625	3/4	1-1/2	<b>51032</b>	<b>92098</b>
52	.0635	3/4	1-1/2	<b>51033</b>	<b>92099</b>
51	.0670	3/4	1-1/2	<b>51034</b>	<b>92100</b>
50	.0700	7/8	1-3/4	<b>51035</b>	<b>92101</b>
49	.0730	7/8	1-3/4	<b>51036</b>	<b>92102</b>
48	.0760	7/8	1-3/4	<b>51037</b>	<b>92103</b>
<b>5/64</b>	.0781	7/8	1-3/4	<b>51038</b>	<b>92104</b>

Foret au carbure

Broca de carburo



**List No. 5374 - Uncoated**

**List No. 5374T - TiAlN Coated**

**118° Point - Split Point for sizes over 1/16"**

**25° Helix Angle**

**TOLERANCES**

All sizes +.0000/-0.0005

**STANDARD PACKAGE**

All sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5374 UNCOATED EDP NO.	5374T TiAlN EDP NO.
47	.0785	7/8	1-3/4	<b>51039</b>	<b>92105</b>
2.00 mm	.0787	7/8	1-3/4	<b>50978</b>	<b>92106</b>
46	.0810	7/8	1-3/4	<b>51040</b>	<b>92107</b>
45	.0820	7/8	1-3/4	<b>51041</b>	<b>92108</b>
44	.0860	1	2	<b>51042</b>	<b>92109</b>
43	.0890	1	2	<b>51043</b>	<b>92110</b>
42	.0935	1	2	<b>51044</b>	<b>92111</b>
<b>3/32</b>	.0938	1	2	<b>51045</b>	<b>92112</b>
41	.0960	1	2	<b>51046</b>	<b>92113</b>
40	.0980	1	2	<b>51047</b>	<b>92114</b>
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2.50 mm	.0984	1	2	<b>50979</b>	<b>92115</b>
39	.0995	1-1/4	2-1/4	<b>51048</b>	<b>92116</b>
38	.1015	1-1/4	2-1/4	<b>51049</b>	<b>92117</b>
37	.1040	1-1/4	2-1/4	<b>51050</b>	<b>92118</b>
36	.1065	1-1/4	2-1/4	<b>51051</b>	<b>92119</b>
<b>7/64</b>	.1094	1-1/4	2-1/4	<b>51052</b>	<b>92120</b>
35	.1100	1-1/4	2-1/4	<b>51053</b>	<b>92121</b>
34	.1110	1-1/4	2-1/4	<b>51054</b>	<b>92122</b>
33	.1130	1-1/4	2-1/4	<b>51055</b>	<b>92123</b>
32	.1160	1-1/4	2-1/4	<b>51056</b>	<b>92124</b>
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3.00 mm	.1181	1-1/4	2-1/4	<b>50980</b>	<b>92125</b>
31	.1200	1-1/4	2-1/4	<b>51057</b>	<b>92126</b>
<b>1/8</b>	.1250	1-1/4	2-1/4	<b>51058</b>	<b>92127</b>
30	.1285	1-1/4	2-1/4	<b>51059</b>	<b>92128</b>
29	.1360	1-3/8	2-1/2	<b>51060</b>	<b>92129</b>
3.50 mm	.1378	1-3/8	2-1/2	<b>50981</b>	<b>92130</b>
28	.1405	1-3/8	2-1/2	<b>51061</b>	<b>92131</b>
<b>9/64</b>	.1406	1-3/8	2-1/2	<b>51062</b>	<b>92132</b>
27	.1440	1-3/8	2-1/2	<b>51063</b>	<b>92133</b>
26	.1470	1-3/8	2-1/2	<b>51064</b>	<b>92134</b>
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25	.1495	1-3/8	2-1/2	<b>51065</b>	<b>92135</b>
24	.1520	1-3/8	2-1/2	<b>51066</b>	<b>92136</b>
23	.1540	1-3/8	2-1/2	<b>51067</b>	<b>92137</b>
<b>5/32</b>	.1562	1-3/8	2-1/2	<b>51068</b>	<b>92138</b>
22	.1570	1-3/8	2-1/2	<b>51069</b>	<b>92139</b>
4.00 mm	.1575	1-3/8	2-1/2	<b>50982</b>	<b>92140</b>
21	.1590	1-3/8	2-1/2	<b>51070</b>	<b>92141</b>
20	.1610	1-3/8	2-1/2	<b>51071</b>	<b>92142</b>
19	.1660	1-5/8	2-3/4	<b>51072</b>	<b>92143</b>
18	.1695	1-5/8	2-3/4	<b>51073</b>	<b>92144</b>

**Tool Coatings Also Available**

(continued)



# Solid Carbide Standard Length Drills

Recommended for drilling cast iron, non ferrous alloys, plastics, aluminum and other easily machined materials.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding.

Foret au carbure

Broca de carburo



**List No. 5374 - Uncoated**

**List No. 5374T - TiAlN Coated**

**118° Point - Split Point for sizes over 1/16"**

**25° Helix Angle**

**TOLERANCES**

All sizes +.0000/- .0005

**STANDARD PACKAGE**

All sizes — 1 each

(continued)

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5374 UNCOATED EDP NO.	5374T TiAlN EDP NO.	SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5374 UNCOATED EDP NO.	5374T TiAlN EDP NO.
<b>11/64</b>	.1719	1-5/8	2-3/4	<b>51074</b>	<b>92145</b>	L	.2900	2-1/8	3-1/2	<b>51110</b>	<b>92186</b>
17	.1730	1-5/8	2-3/4	<b>51075</b>	<b>92146</b>	M	.2950	2-3/8	3-3/4	<b>51111</b>	<b>92187</b>
16	.1770	1-5/8	2-3/4	<b>51076</b>	<b>92147</b>	7.50 mm	.2953	2-3/8	3-3/4	<b>50989</b>	<b>92188</b>
4.50 mm	.1772	1-5/8	2-3/4	<b>50983</b>	<b>92148</b>	<b>19/64</b>	.2969	2-3/8	3-3/4	<b>51112</b>	<b>92189</b>
15	.1800	1-5/8	2-3/4	<b>51077</b>	<b>92149</b>	N	.3020	2-3/8	3-3/4	<b>51113</b>	<b>92190</b>
14	.1820	1-5/8	2-3/4	<b>51078</b>	<b>92150</b>	<b>5/16</b>	.3125	2-3/8	3-3/4	<b>51114</b>	<b>92191</b>
13	.1850	1-5/8	2-3/4	<b>51079</b>	<b>92151</b>	8.00 mm	.3150	2-3/8	3-3/4	<b>50990</b>	<b>92192</b>
<b>3/16</b>	.1875	1-5/8	2-3/4	<b>51080</b>	<b>92152</b>	O	.3160	2-3/8	3-3/4	<b>51115</b>	<b>92193</b>
12	.1890	1-5/8	2-3/4	<b>51081</b>	<b>92153</b>	P	.3230	2-3/8	3-3/4	<b>51116</b>	<b>92194</b>
11	.1910	1-5/8	2-3/4	<b>51082</b>	<b>92154</b>	<b>21/64</b>	.3281	2-1/2	4	<b>51117</b>	<b>92195</b>
10	.1935	1-5/8	2-3/4	<b>51083</b>	<b>92155</b>	Q	.3320	2-1/2	4	<b>51118</b>	<b>92196</b>
9	.1960	1-3/4	3	<b>51084</b>	<b>92156</b>	8.50 mm	.3346	2-1/2	4	<b>50991</b>	<b>92197</b>
5.00 mm	.1969	1-3/4	3	<b>50984</b>	<b>92157</b>	R	.3390	2-1/2	4	<b>51119</b>	<b>92198</b>
8	.1990	1-3/4	3	<b>51085</b>	<b>92158</b>	<b>11/32</b>	.3438	2-1/2	4	<b>51120</b>	<b>92199</b>
7	.2010	1-3/4	3	<b>51086</b>	<b>92159</b>	S	.3480	2-1/2	4	<b>51121</b>	<b>92200</b>
<b>13/64</b>	.2031	1-3/4	3	<b>51087</b>	<b>92160</b>	9.00 mm	.3543	2-1/2	4	<b>50992</b>	<b>92201</b>
6	.2040	1-3/4	3	<b>51088</b>	<b>92161</b>	T	.3580	2-3/4	4-1/4	<b>51122</b>	<b>92202</b>
5	.2055	1-3/4	3	<b>51089</b>	<b>92162</b>	<b>23/64</b>	.3594	2-3/4	4-1/4	<b>51123</b>	<b>92203</b>
4	.2090	1-3/4	3	<b>51090</b>	<b>92163</b>	U	.3680	2-3/4	4-1/4	<b>51124</b>	<b>92204</b>
3	.2130	1-3/4	3	<b>51091</b>	<b>92164</b>	9.50 mm	.3740	2-3/4	4-1/4	<b>50993</b>	<b>92205</b>
5.50 mm	.2165	1-3/4	3	<b>50985</b>	<b>92165</b>	<b>3/8</b>	.3750	2-3/4	4-1/4	<b>51125</b>	<b>92206</b>
<b>7/32</b>	.2188	1-3/4	3	<b>51092</b>	<b>92166</b>	V	.3770	2-3/4	4-1/4	<b>51126</b>	<b>92207</b>
2	.2210	1-3/4	3	<b>51093</b>	<b>92167</b>	W	.3860	2-7/8	4-1/2	<b>51127</b>	<b>92208</b>
1	.2280	1-3/4	3	<b>51094</b>	<b>92168</b>	<b>25/64</b>	.3906	2-7/8	4-1/2	<b>51128</b>	<b>92209</b>
A	.2340	2	3-1/4	<b>51095</b>	<b>92169</b>	10.00 mm	.3937	2-7/8	4-1/2	<b>50994</b>	<b>92210</b>
<b>15/64</b>	.2344	2	3-1/4	<b>51096</b>	<b>92170</b>	X	.3970	2-7/8	4-1/2	<b>51129</b>	<b>92211</b>
6.00 mm	.2362	2	3-1/4	<b>50986</b>	<b>92171</b>	Y	.4040	2-7/8	4-1/2	<b>51130</b>	<b>92212</b>
B	.2380	2	3-1/4	<b>51097</b>	<b>92172</b>	<b>13/32</b>	.4062	2-7/8	4-1/2	<b>51131</b>	<b>92213</b>
C	.2420	2	3-1/4	<b>51098</b>	<b>92173</b>	Z	.4130	2-7/8	4-1/2	<b>51132</b>	<b>92214</b>
D	.2460	2	3-1/4	<b>51099</b>	<b>92174</b>	10.50 mm	.4134	2-7/8	4-1/2	<b>50995</b>	<b>92215</b>
<b>1/4 (E)</b>	.2500	2	3-1/4	<b>51100</b>	<b>92175</b>	<b>27/64</b>	.4219	2-7/8	4-1/2	<b>51133</b>	<b>92216</b>
6.50 mm	.2559	2	3-1/4	<b>50987</b>	<b>92176</b>	11.00 mm	.4331	2-7/8	4-1/2	<b>50996</b>	<b>92217</b>
F	.2570	2	3-1/4	<b>51102</b>	<b>92177</b>	<b>7/16</b>	.4375	2-7/8	4-1/2	<b>51134</b>	<b>92218</b>
G	.2610	2-1/8	3-1/2	<b>51103</b>	<b>92178</b>	11.50 mm	.4528	3	4-3/4	<b>50997</b>	<b>92219</b>
<b>17/64</b>	.2656	2-1/8	3-1/2	<b>51104</b>	<b>92179</b>	<b>29/64</b>	.4531	3	4-3/4	<b>51135</b>	<b>92220</b>
H	.2660	2-1/8	3-1/2	<b>51105</b>	<b>92180</b>	<b>15/32</b>	.4688	3	4-3/4	<b>51136</b>	<b>92221</b>
I	.2720	2-1/8	3-1/2	<b>51106</b>	<b>92181</b>	12.00 mm	.4724	3	4-3/4	<b>50998</b>	<b>92222</b>
7.00 mm	.2756	2-1/8	3-1/2	<b>50988</b>	<b>92182</b>	<b>31/64</b>	.4844	3	4-3/4	<b>51137</b>	<b>92223</b>
J	.2770	2-1/8	3-1/2	<b>51107</b>	<b>92183</b>	12.50 mm	.4921	3	4-3/4	<b>50999</b>	<b>92224</b>
K	.2810	2-1/8	3-1/2	<b>51108</b>	<b>92184</b>	<b>1/2</b>	.5000	3	4-3/4	<b>51138</b>	<b>92225</b>
<b>9/32</b>	.2812	2-1/8	3-1/2	<b>51109</b>	<b>92185</b>						

Tool Coatings Also Available

# Solid Carbide Straight Flute Drills

## For Hardened & Abrasive Applications

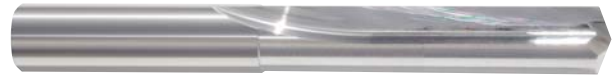
Recommended for hardened, high strength & abrasive materials. Produce close tolerance holes in stainless steels, alloy steels, aerospace alloys, exotic alloys, cryogenic alloys and other materials 40Rc hardness and higher.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

Foret au carbure

Broca de carburo



List No. 5376 - Uncoated

List No. 5376T - TiAlN Coated

2-Flute - 140° Notch Point

**TOLERANCES**

All sizes +.0000/-.0005

**STANDARD PACKAGE**

All sizes — 1 each

Speeds & Feeds: Page 83

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5376 UNCOATED EDP NO.	5376T TiAlN EDP NO.	SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5376 UNCOATED EDP NO.	5376T TiAlN EDP NO.
1/32	.0312	1/2	1-1/2	50720	92660	35	.1100	7/8	1-7/8	50751	92691
#65	.0350	1/2	1-1/2	54860	93040	34	.1110	7/8	1-7/8	50752	92692
#64	.0360	1/2	1-1/2	54861	93041	33	.1130	7/8	1-7/8	50753	92693
#63	.0370	1/2	1-1/2	54862	93042	32	.1160	7/8	1-7/8	50754	92694
#62	.0380	1/2	1-1/2	54863	93043	3.0 MM	.1181	7/8	1-7/8	50755	92695
#61	.0390	1/2	1-1/2	54864	93044	31	.1200	7/8	1-7/8	50756	92696
1.0 MM	.0394	1/2	1-1/2	50721	92661	1/8	.1250	7/8	1-7/8	50757	92697
#60	.0400	1/2	1-1/2	54865	93045	30	.1285	15/16	1-15/16	50758	92698
#59	.0410	1/2	1-1/2	54866	93046	29	.1360	15/16	1-15/16	50759	92699
#58	.0420	1/2	1-1/2	54867	93047	3.5 MM	.1378	15/16	1-15/16	50760	92700
#57	.0430	1/2	1-1/2	54868	93048	28	.1405	15/16	1-15/16	50761	92701
56	.0465	1/2	1-1/2	50722	92662	9/64	.1406	15/16	1-15/16	50762	92702
3/64	.0469	1/2	1-1/2	50723	92663	27	.1440	1	2-1/16	50763	92703
55	.0520	1/2	1-1/2	50724	92664	26	.1470	1	2-1/16	50764	92704
54	.0550	1/2	1-1/2	50725	92665	25	.1495	1	2-1/16	50765	92705
1.5 MM	.0591	1/2	1-1/2	50726	92666	24	.1520	1	2-1/16	50766	92706
53	.0595	1/2	1-1/2	50727	92667	23	.1540	1	2-1/16	50767	92707
1/16	.0625	5/8	1-5/8	50728	92668	5/32	.1562	1	2-1/16	50768	92708
52	.0635	11/16	1-11/16	50729	92669	22	.1570	1-1/16	2-1/8	50769	92709
51	.0670	11/16	1-11/16	50730	92670	4.0 MM	.1575	1-1/16	2-1/8	50770	92710
50	.0700	11/16	1-11/16	50731	92671	21	.1590	1-1/16	2-1/8	50771	92711
49	.0730	11/16	1-11/16	50732	92672	20	.1610	1-1/16	2-1/8	50772	92712
48	.0760	11/16	1-11/16	50733	92673	19	.1660	1-1/16	2-1/8	50773	92713
5/64	.0781	11/16	1-11/16	50734	92674	18	.1695	1-1/16	2-1/8	50774	92714
47	.0785	3/4	1-3/4	50735	92675	11/64	.1719	1-1/16	2-1/8	50775	92715
2.0 MM	.0787	3/4	1-3/4	50736	92676	17	.1730	1-1/8	2-3/16	50776	92716
46	.0810	3/4	1-3/4	50737	92677	16	.1770	1-1/8	2-3/16	50777	92717
45	.0820	3/4	1-3/4	50738	92678	4.5 MM	.1772	1-1/8	2-3/16	50778	92718
44	.0860	3/4	1-3/4	50739	92679	15	.1800	1-1/8	2-3/16	50779	92719
43	.0890	3/4	1-3/4	50740	92680	14	.1820	1-1/8	2-3/16	50780	92720
42	.0935	3/4	1-3/4	50741	92681	13	.1850	1-1/8	2-3/16	50781	92721
3/32	.0938	3/4	1-3/4	50742	92682	3/16	.1875	1-1/8	2-3/16	50782	92722
41	.0960	13/16	1-13/16	50743	92683	12	.1890	1-3/16	2-1/4	50783	92723
40	.0980	13/16	1-13/16	50744	92684	11	.1910	1-3/16	2-1/4	50784	92724
2.5 MM	.0984	13/16	1-13/16	50745	92685	10	.1935	1-3/16	2-1/4	50785	92725
39	.0995	13/16	1-13/16	50746	92686	9	.1960	1-3/16	2-1/4	50786	92726
38	.1015	13/16	1-13/16	50747	92687	5.0 MM	.1969	1-3/16	2-1/4	50787	92727
37	.1040	13/16	1-13/16	50748	92688	8	.1990	1-3/16	2-1/4	50788	92728
36	.1065	13/16	1-13/16	50749	92689	7	.2010	1-3/16	2-1/4	50789	92729
7/64	.1094	13/16	1-13/16	50750	92690						

Tool Coatings Also Available

(continued)

# Solid Carbide Straight Flute Drills

## For Hardened & Abrasive Materials

Recommended for hardened, high strength & abrasive materials. Produce close tolerance holes in stainless steels, alloy steels, aerospace alloys, exotic alloys, cryogenic alloys and other materials 40Rc hardness and higher.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

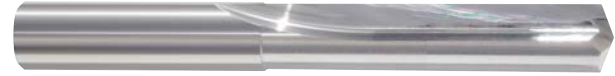
**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

(continued)

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5376 UNCOATED EDP NO.	5376T TiAlN EDP NO.
13/64	.2031	1-3/16	2-1/4	50790	92730
6	.2040	1-1/4	2-3/8	50791	92731
5	.2055	1-1/4	2-3/8	50792	92732
4	.2090	1-1/4	2-3/8	50793	92733
3	.2130	1-1/4	2-3/8	50794	92734
5.5 MM	.2165	1-1/4	2-3/8	50795	92735
7/32	.2188	1-1/4	2-3/8	50796	92736
2	.2210	1-5/16	2-7/16	50797	92737
1	.2280	1-5/16	2-7/16	50798	92738
A	.2340	1-5/16	2-7/16	50799	92739
15/64	.2344	1-5/16	2-7/16	50800	92740
6.0 MM	.2362	1-5/16	2-7/16	50801	92741
B	.2380	1-3/8	2-1/2	50802	92742
C	.2420	1-3/8	2-1/2	50803	92743
D	.2460	1-3/8	2-1/2	50804	92744
1/4 (E)	.2500	1-3/8	2-1/2	50805	92745
6.5 MM	.2559	1-3/8	2-1/2	50806	92746
F	.2570	1-7/16	2-5/8	50807	92747
G	.2610	1-7/16	2-5/8	50808	92748
17/64	.2656	1-7/16	2-5/8	50809	92749
H	.2660	1-1/2	2-11/16	50810	92750
I	.2720	1-1/2	2-11/16	50811	92751
7.0 MM	.2756	1-1/2	2-11/16	50812	92752
J	.2770	1-1/2	2-11/16	50813	92753
K	.2810	1-1/2	2-11/16	50814	92754
9/32	.2812	1-1/2	2-11/16	50815	92755
L	.2900	1-9/16	2-3/4	50816	92756
M	.2950	1-9/16	2-3/4	50817	92757
7.5 MM	.2953	1-9/16	2-3/4	50818	92758
19/64	.2969	1-9/16	2-3/4	50819	92759
N	.3020	1-5/8	2-13/16	50820	92760
5/16	.3125	1-5/8	2-13/16	50821	92761
8.0 MM	.3150	1-5/8	2-13/16	50822	92762
O	.3160	1-11/16	2-15/16	50823	92763
P	.3230	1-11/16	2-15/16	50824	92764
21/64	.3281	1-11/16	2-15/16	50825	92765
Q	.3320	1-11/16	3	50826	92766
8.5 MM	.3346	1-11/16	3	50827	92767

Foret au carbure

Broca de carburo



List No. 5376 - Uncoated

List No. 5376T - TiAlN Coated

2-Flute – 140° Notch Point

### TOLERANCES

All sizes +.0000/-.0005

### STANDARD PACKAGE

All sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	5376 UNCOATED EDP NO.	5376T TiAlN EDP NO.
R	.3390	1-11/16	3	50828	92768
11/32	.3438	1-11/16	3	50829	92769
S	.3480	1-3/4	3-1/16	50830	92770
9.0 MM	.3543	1-3/4	3-1/16	50831	92771
T	.3580	1-3/4	3-1/16	50832	92772
23/64	.3594	1-3/4	3-1/16	50833	92773
U	.3680	1-13/16	3-1/8	50834	92774
9.5 MM	.3740	1-13/16	3-1/8	50835	92775
3/8	.3750	1-13/16	3-1/8	50836	92776
V	.3770	1-7/8	3-1/4	50837	92777
W	.3860	1-7/8	3-1/4	50838	92778
25/64	.3906	1-7/8	3-1/4	50839	92779
10.0 MM	.3937	1-7/8	3-1/4	50840	92780
X	.3970	1-15/16	3-5/16	50841	92781
Y	.4040	1-15/16	3-5/16	50842	92782
13/32	.4062	1-15/16	3-5/16	50843	92783
Z	.4130	2	3-3/8	50844	92784
10.5 MM	.4134	2	3-3/8	50845	92785
27/64	.4219	2	3-3/8	50846	92786
11.0 MM	.4331	2	3-3/8	50847	92787
7/16	.4375	2-1/16	3-7/16	50848	92788
11.5 MM	.4528	2-1/16	3-7/16	50849	92789
29/64	.4531	2-1/8	3-9/16	50850	92790
15/32	.4688	2-1/8	3-5/8	50851	92791
12.0 MM	.4724	2-1/8	3-5/8	50852	92792
31/64	.4844	2-3/16	3-11/16	50853	92793
12.5 MM	.4921	2-3/16	3-11/16	50854	92794
1/2	.5000	2-1/4	3-3/4	50855	92795
33/64	.5156	1-1/8	3-1/2	54869	93049
17/32	.5312	1-1/8	3-1/2	54870	93050
35/64	.5469	1-1/8	3-1/2	54871	93051
9/16	.5625	1-1/8	3-1/2	54872	93052
5/8	.6250	1-1/4	3-1/2	54873	93053
11/16	.6875	1-1/2	4	54874	93054
3/4	.7500	1-1/2	4	54875	93055

Tool Coatings Also Available

# Solid Carbide Spade Drills

Foret à langue d'aspic au carbure

Broca tipo espada de carburo

Recommended for thin sheet applications, shallow hole drilling and spot drilling in a wide range of materials

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.



List No. 5377

118° Point – Heavy Duty Web

**TOLERANCES**

All sizes +.0000/-0.0005

**STANDARD PACKAGE**

All sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.	SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/32	.0312	3/16	1-1/2	50440	7/32	.2188	19/32	2	50450
3/64	.0469	7/32	1-1/2	50441	1/4	.2500	11/16	2	50451
1/16	.0625	5/16	1-1/2	50442	9/32	.2812	7/8	2-1/2	50452
3/32	.0938	7/16	1-1/2	50443	5/16	.3125	7/8	2-1/2	50453
7/64	.1094	7/16	1-1/2	50444	11/32	.3438	15/16	2-1/2	50454
1/8	.1250	1/2	1-1/2	50445	3/8	.3750	1-1/8	2-1/2	50455
9/64	.1406	1/2	2	50446	13/32	.4062	1-1/8	2-1/2	50456
5/32	.1562	9/16	2	50447	7/16	.4375	1-3/16	2-1/2	50457
11/64	.1719	9/16	2	50448	15/32	.4688	1-3/16	2-1/2	50458
3/16	.1875	11/16	2	50449	1/2	.5000	1-3/16	2-1/2	50459

## TOOL COATINGS

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish.

### TiN – Titanium Nitride

A good general purpose coating for a wide range of ferrous materials. Not recommended for non-ferrous materials. Has higher heat resistance than TiCN coating.

### TiCN – Titanium Carbonitride

Enhanced toughness, hardness & wear resistance for aggressive speeds & feeds. Recommended for difficult-to-machine, gummy & abrasive materials where moderate cutting temperatures are generated.

### TiALN – Titanium Aluminum Nitride

### ALTiN – Aluminum Titanium Nitride

Excellent all around coatings featuring high heat resistance. Recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials that generate higher cutting temperatures. ALTiN has higher AL content for increased hardness & heat resistance.

### CrN – Chromium Nitride

### CrC – Chromium Carbide

Especially recommended for titanium and non-ferrous materials including aluminum, copper & brass. CrC has slightly higher hardness than CrN. These coatings resist adhesion of the material being machined and resist chipping and cracking.

### DLC – Diamond Like Carbon

A thin carbon based amorphous (non-crystalline) coating featuring very high hardness & low coefficient of friction. Highly recommended for non-ferrous materials including plastic, aluminum, copper & brass. Typically used on solid carbide tools.

# Carbide Tipped Drills For Hardened Steel

For drilling hardened steel of 35 to 65 Rockwell C hardness without the need to anneal the workpiece



## List No. 5420

**120° Spade Type Point** features short heavy construction for increased rigidity in tougher shallow hole applications up to 2 diameters deep. Drill body diameter is smaller than tip diameter to prevent galling.

## List No. 5420

SIZE	DEC. EQUIV.	OAL	EDP NO.
3/32†	.0938	2	52006
1/8†	.1250	2	52008
5/32†	.1562	2	52010
3/16†	.1875	3	52012
13/64†	.2031	3	52013*
7/32	.2188	3 1/2	52014
1/4	.2500	4	52016
19/64	.2969	4	52019*
5/16	.3125	4	52020
11/32	.3438	4	52022
3/8	.3750	4	52024
7/16	.4375	4 1/2	52028
15/32	.4688	4 1/2	52030*
1/2	.5000	5	52032

† Sizes below 7/32" are Solid Carbide Spade Type, not the Fluted Type Shown.

\* Available While Supplies Last

# Carbide Tipped Glass and Tile Drills

Excellent wear resistance for drilling glass, tile, porcelain, ceramic and other hard fragile materials without chipping or cracking the material. Extra long carbide tip for many regrinds.

SIZE	DEC. EQUIV.	OAL	SHANK DIA.	EDP NO.
1/8	.1250	2 1/2	7/64	53551
3/16	.1875	2 1/2	5/32	53552
1/4	.2500	2 1/2	7/32	53553
5/16	.3125	3	1/4	53554
3/8	.3750	3 1/2	5/16	53555

Foret en acier dur

Broca de acero duro



## List No. 5423

**118° Point** with two straight flutes. Drill body diameter is smaller than tip diameter to prevent galling.

**STANDARD PACKAGE** All sizes — 1 each

## List No. 5423

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	SHANK DIA.	EDP NO.
3/16	.1875	1 1/2	3 1/2	11/64	52112
7/32	.2188	1 3/4	3 3/4	13/64	52114
1/4	.2500	2	4	7/32	52116
9/32	.2812	2 1/4	4 1/4	1/4	52118
5/16	.3125	2 1/2	4 1/2	17/64	52120
11/32	.3438	2 3/4	4 3/4	19/64	52122
3/8	.3750	3	5	21/64	52124
7/16	.4375	3	5 1/2	25/64	52128
1/2	.5000	3 1/2	6	29/64	52132
9/16	.5625	3 1/2	6	17/32	52136
19/32	.5938	4	7	9/16	52138*
5/8	.6250	4	7	19/32	52140
3/4	.7500	4 3/4	8	23/32	52148

Foret pour le verre et la tuile

Broca para vidrio y azulejos



## List No. 5467 — Spear Point

**STANDARD PACKAGE** All sizes — 1 each

SIZE	DEC. EQUIV.	OAL	SHANK DIA.	EDP NO.
7/16	.4375	3 1/2	3/8	53556
1/2	.5000	3 1/2	7/16	53557
9/16	.5625	4	1/2	53558
5/8	.6250	4	9/16	53559

## TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Screw Machine Length Drills

**High Speed Steel - 118° Point**  
**General Purpose**  
**Bright Finish or TiN Coated**

Developed primarily for use in screw machines, these short length drills provide maximum rigidity resulting in increased hole accuracy and extended tool life. Recommended for drilling a wide variety of materials including non-ferrous materials and low tensile strength steels.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Enhanced hole quality at higher speeds and feeds.

<b>SHANK DIAMETERS</b>	<b>Drill Size</b>	<b>Shank Diameter</b>
	Up to 1"	Same as drill dia.
	Over 1" to 1¼"	1"
	Over 1¼" to 1½"	1¼"
	Over 1½"	1½"

Foret série extra-courte

Broca extra corta



- List No. 1435 Fractional - Bright Finish
- List No. 1436 Letter - Bright Finish
- List No. 1437 Wire Gage - Bright Finish



- List No. 1435G Fractional - TiN Coated
- List No. 1437G Wire Gage - TiN Coated

**STANDARD PACKAGE**      **Fractional Sizes**  
 1/16" thru 3/8" — 12 each  
 25/64" thru 1/2" — 6 each  
 All other sizes — 1 each

**Letter Sizes**      **Wire Gages**  
 A thru V — 12 each      #1 thru #60 — 12 each  
 W thru Z — 6 each

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	BRIGHT EDP NO.	TIN COAT EDP NO.
		60	.0400	½	1⅜	15101	—
		59	.0410	½	1⅜	15102	—
		58	.0420	½	1⅜	15103	—
		57	.0430	½	1⅜	15104	—
		56	.0465	½	1⅜	15105	—
		55	.0520	5/8	1⅝	15107	—
		54	.0550	5/8	1⅝	15108	—
		53	.0595	5/8	1⅝	15109	—
1/16			.0625	5/8	1⅝	15110	95110
		52	.0635	11/16	111/16	15111	—
		51	.0670	11/16	111/16	15112	—
		50	.0700	11/16	111/16	15113	—
		49	.0730	11/16	111/16	15114	—
		48	.0760	11/16	111/16	15115	—
5/64			.0781	11/16	111/16	15116	95116
		47	.0785	¾	1¾	15117	—
		46	.0810	¾	1¾	15118	—
		45	.0820	¾	1¾	15119	—
		44	.0860	¾	1¾	15120	—
		43	.0890	¾	1¾	15121	—
		42	.0935	¾	1¾	15122	—
3/32			.0937	¾	1¾	15123	95123
		41	.0960	13/16	113/16	15124	—
		40	.0980	13/16	113/16	15125	95125
		39	.0995	13/16	113/16	15126	95126
		38	.1015	13/16	113/16	15127	95127
		37	.1040	13/16	113/16	15128	95128
		36	.1065	13/16	113/16	15129	95129
7/64			.1094	13/16	113/16	15130	95130
		35	.1100	7/8	17/8	15131	95131
		34	.1110	7/8	17/8	15132	95132
		33	.1130	7/8	17/8	15133	95133
		32	.1160	7/8	17/8	15134	95134
		31	.1200	7/8	17/8	15135	95135
1/8			.1250	7/8	17/8	15136	95136
		30	.1285	15/16	115/16	15137	95137
		29	.1360	15/16	115/16	15138	95138
		28	.1405	15/16	115/16	15139	95139
9/64			.1406	15/16	115/16	15140	95140
		27	.1440	1	21/16	15141	95141
		26	.1470	1	21/16	15142	95142
		25	.1495	1	21/16	15143	95143

(continued)

# Screw Machine Length Drills (continued)

List Nos. 1435, 1436

Foret série extra-courte

Broca extra corta

SIZE		WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	BRIGHT EDP	TIN COAT EDP
FRAC-TIONAL	LETTER					NO.	NO.
5/32		24	.1520	1	2 1/16	15144	95144
		23	.1540	1	2 1/16	15145	95145
			.1562	1	2 1/16	15146	95146
		22	.1570	1 1/16	2 1/8	15147	95147
		21	.1590	1 1/16	2 1/8	15148	95148
1 1/64		20	.1610	1 1/16	2 1/8	15149	95149
		19	.1660	1 1/16	2 1/8	15150	95150
		18	.1695	1 1/16	2 1/8	15151	95151
			.1719	1 1/16	2 1/8	15152	95152
		17	.1730	1 1/8	2 3/16	15153	95153
3/16		16	.1770	1 1/8	2 3/16	15154	95154
		15	.1800	1 1/8	2 3/16	15155	95155
		14	.1820	1 1/8	2 3/16	15156	95156
		13	.1850	1 1/8	2 3/16	15157	95157
			.1875	1 1/8	2 3/16	15158	95158
1 3/64		12	.1890	1 3/16	2 1/4	15159	95159
		11	.1910	1 3/16	2 1/4	15160	95160
		10	.1935	1 3/16	2 1/4	15161	95161
		9	.1960	1 3/16	2 1/4	15162	95162
		8	.1990	1 3/16	2 1/4	15163	95163
		7	.2010	1 3/16	2 1/4	15164	95164
			.2031	1 3/16	2 1/4	15165	95165
7/32		6	.2040	1 1/4	2 3/8	15166	95166
		5	.2055	1 1/4	2 3/8	15167	95167
		4	.2090	1 1/4	2 3/8	15168	95168
		3	.2130	1 1/4	2 3/8	15169	95169
			.2187	1 1/4	2 3/8	15170	95170
1 5/64		2	.2210	1 5/16	2 7/16	15171	95171
		1	.2280	1 5/16	2 7/16	15172	95172
	A		.2340	1 5/16	2 7/16	15173	—
			.2344	1 5/16	2 7/16	15174	95174
		B	.2380	1 3/8	2 1/2	15175	—
		C	.2420	1 3/8	2 1/2	15176	—
		D	.2460	1 3/8	2 1/2	15177	—
1/4	E	.2500	1 3/8	2 1/2	15178	95178	
	F	.2570	1 7/16	2 5/8	15180	—	
	G	.2610	1 7/16	2 5/8	15181	—	
1 7/64		.2656	1 7/16	2 5/8	15182	95182	
	H	.2660	1 1/2	2 11/16	15183	—	
	I	.2720	1 1/2	2 11/16	15184	—	
9/32	J	.2770	1 1/2	2 11/16	15185	—	
	K	.2810	1 1/2	2 11/16	15186	—	
		.2812	1 1/2	2 11/16	15187	95187	
	L	.2900	1 9/16	2 3/4	15188	—	
	M	.2950	1 9/16	2 3/4	15189	—	
1 9/64		.2969	1 9/16	2 3/4	15190	95190	
	N	.3020	1 5/8	2 13/16	15191	—	
5/16		.3125	1 5/8	2 13/16	15192	95192	
	O	.3160	1 11/16	2 15/16	15193	—	
	P	.3230	1 11/16	2 15/16	15194	—	
2 1/64		.3281	1 11/16	2 15/16	15195	95195	
	Q	.3320	1 11/16	3	15196	—	
	R	.3390	1 11/16	3	15197	—	
1 1/32		.3437	1 11/16	3	15198	95198	
	S	.3480	1 3/4	3 1/16	15199	—	
2 3/64	T	.3580	1 3/4	3 1/16	15200	—	
		.3594	1 3/4	3 1/16	15201	95201	
	U	.3680	1 13/16	3 1/8	15202	—	
3/8		.3750	1 13/16	3 1/8	15203	95203	
	V	.3770	1 7/8	3 1/4	15204	—	
2 5/64	W	.3860	1 7/8	3 1/4	15205	—	
		.3906	1 7/8	3 1/4	15206	95206	

(continued)

## Screw Machine Length Drills (continued)

List Nos. 1435, 1436

Foret série extra-courte

Broca extra corta

FRAC- TIONAL	SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	BRIGHT EDP NO.	TIN COAT EDP NO.
	LETTER						
13/32	X		.3970	1 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	15207	—
	Y		.4040	1 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	15208	—
	Z		.4062	1 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	15209	95209
27/64			.4130	2	3 <sup>3</sup> / <sub>8</sub>	15210	—
			.4219	2	3 <sup>3</sup> / <sub>8</sub>	15211	95211
7/16			.4375	2 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>16</sub>	15212	95212
29/64			.4531	2 <sup>1</sup> / <sub>8</sub>	3 <sup>9</sup> / <sub>16</sub>	15213	95213
15/32			.4687	2 <sup>1</sup> / <sub>8</sub>	3 <sup>5</sup> / <sub>8</sub>	15214	95214
31/64			.4844	2 <sup>3</sup> / <sub>16</sub>	3 <sup>11</sup> / <sub>16</sub>	15215	95215
1/2			.5000	2 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	15216	95216
33/64			.5156	2 <sup>3</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	15217	—
17/32			.5313	2 <sup>3</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	15218	—
35/64			.5469	2 <sup>1</sup> / <sub>2</sub>	4	15219	—
9/16			.5625	2 <sup>1</sup> / <sub>2</sub>	4	15220	—
37/64			.5781	2 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	15221	—
19/32			.5938	2 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	15222	—
39/64			.6094	2 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	15223	—
5/8			.6250	2 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	15224	—
41/64			.6406	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	15225	—
21/32			.6562	2 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	15226	—
43/64			.6719	2 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	15227	—
11/16			.6875	2 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	15228	—
45/64			.7031	3	4 <sup>3</sup> / <sub>4</sub>	15229	—
23/32			.7188	3	4 <sup>3</sup> / <sub>4</sub>	15230	—
47/64			.7344	3 <sup>1</sup> / <sub>8</sub>	5	15231	—
3/4			.7500	3 <sup>1</sup> / <sub>8</sub>	5	15232	—
49/64			.7657	3 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	15233	—
25/32			.7812	3 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	15234	—
51/64			.7969	3 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	15235	—
13/16			.8125	3 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	15236	—
53/64			.8281	3 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>8</sub>	15237	—
27/32			.8438	3 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>8</sub>	15238	—
55/64			.8594	3 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	15239	—
7/8			.8750	3 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	15240	—
57/64			.8906	3 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	15241	—
29/32			.9062	3 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	15242	—
59/64			.9219	3 <sup>3</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub>	15243	—
15/16			.9375	3 <sup>3</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub>	15244	—
61/64			.9531	3 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	15245	—
31/32			.9688	3 <sup>7</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	15246	—
63/64			.9844	4	6	15247	—
1			1.0000	4	6	15248	—
1 <sup>1</sup> / <sub>16</sub>			1.0625	4	6 <sup>1</sup> / <sub>4</sub>	15249	—
1 <sup>1</sup> / <sub>8</sub>			1.1250	4	6 <sup>3</sup> / <sub>8</sub>	15250	—
1 <sup>3</sup> / <sub>16</sub>			1.1875	4 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	15251	—
1 <sup>1</sup> / <sub>4</sub>			1.2500	4 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>	15252	—
1 <sup>5</sup> / <sub>16</sub>			1.3125	4 <sup>3</sup> / <sub>8</sub>	7	15253	—
1 <sup>3</sup> / <sub>8</sub>			1.3750	4 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>8</sub>	15254	—
1 <sup>7</sup> / <sub>16</sub>			1.4375	4 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub>	15255	—
1 <sup>1</sup> / <sub>2</sub>			1.5000	4 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	15256	—
1 <sup>9</sup> / <sub>16</sub>			1.5625	4 <sup>7</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>4</sub>	15257	—
1 <sup>5</sup> / <sub>8</sub>			1.6250	4 <sup>7</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>4</sub>	15258	—
1 <sup>11</sup> / <sub>16</sub>			1.6875	5 <sup>1</sup> / <sub>8</sub>	8	15259	—
1 <sup>3</sup> / <sub>4</sub>			1.7500	5 <sup>1</sup> / <sub>8</sub>	8	15260	—
1 <sup>13</sup> / <sub>16</sub>			1.8125	5 <sup>3</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>4</sub>	15261	—
1 <sup>7</sup> / <sub>8</sub>			1.8750	5 <sup>3</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>4</sub>	15262	—
1 <sup>15</sup> / <sub>16</sub>			1.9375	5 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>2</sub>	15263	—
2			2.0000	5 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>2</sub>	15264	—



# Aircraft Type C Heavy Duty Screw Machine Length Drills

Straight Shank – High Speed Steel  
135° Split Point – Black Oxide Treated  
Heavy Duty

Heavy duty construction. 135° self-centering split point eliminates "walking" and reduces thrust. Short length provides maximum rigidity for increased hole accuracy and extended tool life. Recommended for drilling a wide range of low to medium tensile strength materials.

Foret série extra-courte

Broca extra corta



List No. 1398  
NAS-907, Type C

STANDARD Fractional Sizes  
PACKAGE 3/64" thru 3/8" — 12 each  
25/64" thru 1/2" — 6 each

**Letter Sizes**

A - V — 12 each  
W - Z — 6 each

**Wire Gage Sizes**

#1 thru #60 — 12 each

\*Sizes #53 and smaller furnished with 135° regular point

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	WIRE GAGE				
	60	.0400	1/2	1 3/8	14880*
	59	.0410	1/2	1 3/8	14881*
	58	.0420	1/2	1 3/8	14882*
	57	.0430	1/2	1 3/8	14883*
	56	.0465	1/2	1 3/8	14884*
3/64		.0469	1/2	1 3/8	14901*
	55	.0520	5/8	1 5/8	14885*
	54	.0550	5/8	1 5/8	14886*
	53	.0595	5/8	1 5/8	14887*
1/16		.0625	5/8	1 5/8	14902
	52	.0635	11/16	1 11/16	14888
	51	.0670	11/16	1 11/16	14889
	50	.0700	11/16	1 11/16	14890
	49	.0730	11/16	1 11/16	14891
	48	.0760	11/16	1 11/16	14892
5/64		.0781	11/16	1 11/16	14903
	47	.0785	3/4	1 3/4	14893
	46	.0810	3/4	1 3/4	14894
	45	.0820	3/4	1 3/4	14895
	44	.0860	3/4	1 3/4	14896
	43	.0890	3/4	1 3/4	14897
	42	.0935	3/4	1 3/4	14898
3/32		.0937	3/4	1 3/4	14904
	41	.0960	13/16	1 13/16	14899
	40	.0980	13/16	1 13/16	14905
	39	.0995	13/16	1 13/16	14906
	38	.1015	13/16	1 13/16	14907
	37	.1040	13/16	1 13/16	14908
	36	.1065	13/16	1 13/16	14909
7/64		.1094	13/16	1 13/16	14910
	35	.1100	7/8	1 7/8	14911
	34	.1110	7/8	1 7/8	14912
	33	.1130	7/8	1 7/8	14913
	32	.1160	7/8	1 7/8	14914
	31	.1200	7/8	1 7/8	14915
1/8		.1250	7/8	1 7/8	14916
	30	.1285	15/16	1 15/16	14917
	29	.1360	15/16	1 15/16	14918
	28	.1405	15/16	1 15/16	14919
9/64		.1406	15/16	1 15/16	14920
	27	.1440	1	2 1/16	14921
	26	.1470	1	2 1/16	14922
	25	.1495	1	2 1/16	14923
	24	.1520	1	2 1/16	14924
	23	.1540	1	2 1/16	14925

SIZE		WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	LETTER					
5/32			.1562	1	2 1/16	14926
		22	.1570	1 1/16	2 1/8	14927
		21	.1590	1 1/16	2 1/8	14928
		20	.1610	1 1/16	2 1/8	14929
		19	.1660	1 1/16	2 1/8	14930
		18	.1695	1 1/16	2 1/8	14931
11/64			.1719	1 1/16	2 1/8	14932
		17	.1730	1 1/8	2 3/16	14933
		16	.1770	1 1/8	2 3/16	14934
		15	.1800	1 1/8	2 3/16	14935
		14	.1820	1 1/8	2 3/16	14936
		13	.1850	1 1/8	2 3/16	14937
3/16			.1875	1 1/8	2 3/16	14938
		12	.1890	1 3/16	2 1/4	14939
		11	.1910	1 3/16	2 1/4	14940
		10	.1935	1 3/16	2 1/4	14941
		9	.1960	1 3/16	2 1/4	14942
		8	.1990	1 3/16	2 1/4	14943
		7	.2010	1 3/16	2 1/4	14944
13/64			.2031	1 3/16	2 1/4	14945
		6	.2040	1 1/4	2 3/8	14946
		5	.2055	1 1/4	2 3/8	14947
		4	.2090	1 1/4	2 3/8	14948
		3	.2130	1 1/4	2 3/8	14949
7/32			.2187	1 1/4	2 3/8	14950
		2	.2210	1 5/16	2 7/16	14951
		1	.2280	1 5/16	2 7/16	14952
15/64	A		.2340	1 5/16	2 7/16	14953
			.2344	1 5/16	2 7/16	14954
	B		.2380	1 3/8	2 1/2	14955
	C		.2420	1 3/8	2 1/2	14956
	D		.2460	1 3/8	2 1/2	14957
1/4	E		.2500	1 3/8	2 1/2	14958
	F		.2570	1 7/16	2 5/8	14959
	G		.2610	1 7/16	2 5/8	14960
17/64			.2656	1 7/16	2 5/8	14963
	H		.2660	1 1/2	2 11/16	14964
	I		.2720	1 1/2	2 11/16	14965
	J		.2770	1 1/2	2 11/16	14966
	K		.2810	1 1/2	2 11/16	14967
9/32			.2812	1 1/2	2 11/16	14968
	L		.2900	1 9/16	2 3/4	14969
	M		.2950	1 9/16	2 3/4	14970
19/64			.2969	1 9/16	2 3/4	14971

(continued)

# Aircraft Type C Screw Machine Length Drills (continued)

List No. 1398

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	LETTER				
5/16	N	.3020	1 5/8	2 13/16	14972
		.3125	1 5/8	2 13/16	14973
	O	.3160	1 11/16	2 15/16	14974
	P	.3230	1 11/16	2 15/16	14975
2 1/64		.3281	1 11/16	2 15/16	14976
1 1/32	Q	.3320	1 11/16	3	14977
	R	.3390	1 11/16	3	14978
1 1/32		.3437	1 11/16	3	14979
	S	.3480	1 3/4	3 1/16	14980
	T	.3580	1 3/4	3 1/16	14981
2 3/64		.3594	1 3/4	3 1/16	14982
3/8	U	.3680	1 13/16	3 1/8	14983
		.3750	1 13/16	3 1/8	14984

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
FRAC-TIONAL	LETTER				
2 5/64	V	.3770	1 7/8	3 1/4	14985
	W	.3860	1 7/8	3 1/4	14986
		.3906	1 7/8	3 1/4	14987
	X	.3970	1 15/16	3 5/16	14988
2 5/64	Y	.4040	1 15/16	3 5/16	14989
1 3/32		.4062	1 15/16	3 5/16	14990
2 7/64	Z	.4130	2	3 3/8	14991
		.4219	2	3 3/8	14992
7/16		.4375	2 1/16	3 7/16	14993
2 9/64		.4531	2 1/8	3 9/16	14994
1 5/32		.4687	2 1/8	3 5/8	14995
3 1/64		.4844	2 3/16	3 11/16	14996
1/2		.5000	2 1/4	3 3/4	14997

## Cobalt Screw Machine Length Drills

### 135° Split Point — Heavy Duty

\*Sizes #53 and smaller 135° Regular Point

Heavy duty construction. Self-centering split point eliminates "walking" and reduces thrust. Short length provides maximum rigidity for increased hole accuracy and extended tool life.

Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials and materials that generate higher cutting temperatures including high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

#### STANDARD PACKAGE

##### Fractional Sizes

1/16" thru 3/8" — 12 each  
25/64" thru 19/32" — 6 each

##### Letter Sizes

A thru V — 12 each  
W thru Z — 6 each

##### Wire Gage Sizes

#1 thru #60 — 12 each

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED	ALTiN
FRAC-TIONAL	WIRE GAGE				EDP NO.	EDP NO.
1/16	60	.0400	1/2	1-3/8	13149*	93636*
	59	.0410	1/2	1-3/8	13150*	93637*
	58	.0420	1/2	1-3/8	13151*	93638*
	57	.0430	1/2	1-3/8	13152*	93639*
	56	.0465	1/2	1-3/8	13153*	93640*
	55	.0520	5/8	1-5/8	13154*	93641*
	54	.0550	5/8	1-5/8	13155*	93642*
	53	.0595	5/8	1-5/8	13156*	93643*
		.0625	5/8	1-5/8	13157	93644
		.0635	11/16	1-11/16	13158	93645
5/64	51	.0670	11/16	1-11/16	13159	93646
	50	.0700	11/16	1-11/16	13160	93647
	49	.0730	11/16	1-11/16	13161	93648
	48	.0760	11/16	1-11/16	13162	93649
		.0781	11/16	1-11/16	13163	93650



Foret au cobalt

Broca de cobalto

Uncoated  
List No. 2435



ALTiN Coated  
List No. 2435T

ALTiN - Aluminum Titanium Nitride - Increases wear & heat resistance, improves chip flow & resists chip welding.

SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED	ALTiN
FRAC-TIONAL	WIRE GAGE				EDP NO.	EDP NO.
3/32	47	.0785	3/4	1-3/4	13164	93651
	46	.0810	3/4	1-3/4	13165	93652
	45	.0820	3/4	1-3/4	13166	93653
	44	.0860	3/4	1-3/4	13167	93654
	43	.0890	3/4	1-3/4	13168	93655
	42	.0935	3/4	1-3/4	13169	93656
		.0937	3/4	1-3/4	13170	93657
		.0960	13/16	1-13/16	13171	93658
		.0980	13/16	1-13/16	13172	93659
		.0995	13/16	1-13/16	13173	93660
7/64	38	.1015	13/16	1-13/16	13174	93661
	37	.1040	13/16	1-13/16	13175	93662
	36	.1065	13/16	1-13/16	13176	93663
		.1094	13/16	1-13/16	13177	93664
	35	.1100	7/8	1-7/8	13178	93665

(continued)

# Cobalt Screw Machine Length Drills (continued)

SIZE							SIZE									
FRAC-TIONAL	LETTER	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED EDP NO.	ALTiN EDP NO.	FRAC-TIONAL	LETTER	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED EDP NO.	ALTiN EDP NO.	
1/8		34	.1110	7/8	1-7/8	<b>13179</b>	<b>93666</b>	15/64			.2344	1-5/16	2-7/16	<b>13221</b>	<b>93708</b>	
		33	.1130	7/8	1-7/8	<b>13180</b>	<b>93667</b>		B		.2380	1-3/8	2-1/2	<b>13222</b>	<b>93709</b>	
		32	.1160	7/8	1-7/8	<b>13181</b>	<b>93668</b>		C		.2420	1-3/8	2-1/2	<b>13223</b>	<b>93710</b>	
		31	.1200	7/8	1-7/8	<b>13182</b>	<b>93669</b>		D		.2460	1-3/8	2-1/2	<b>13224</b>	<b>93711</b>	
				.1250	7/8	1-7/8	<b>13183</b>	<b>93670</b>	1/4	E		.2500	1-3/8	2-1/2	<b>13225</b>	<b>93712</b>
9/64		30	.1285	15/16	1-15/16	<b>13184</b>	<b>93671</b>		F		.2570	1-7/16	2-5/8	<b>13226</b>	<b>93713</b>	
		29	.1360	15/16	1-15/16	<b>13185</b>	<b>93672</b>		G		.2610	1-7/16	2-5/8	<b>13227</b>	<b>93714</b>	
		28	.1405	15/16	1-15/16	<b>13186</b>	<b>93673</b>	17/64			.2656	1-7/16	2-5/8	<b>13228</b>	<b>93715</b>	
				.1406	15/16	1-15/16	<b>13187</b>	<b>93674</b>		H		.2660	1-1/2	2-11/16	<b>13229</b>	<b>93716</b>
		27	.1440	1	2-1/16	<b>13188</b>	<b>93675</b>		I		.2720	1-1/2	2-11/16	<b>13230</b>	<b>93717</b>	
5/32		26	.1470	1	2-1/16	<b>13189</b>	<b>93676</b>		J		.2770	1-1/2	2-11/16	<b>13231</b>	<b>93718</b>	
		25	.1495	1	2-1/16	<b>13190</b>	<b>93677</b>		K		.2810	1-1/2	2-11/16	<b>13232</b>	<b>93719</b>	
		24	.1520	1	2-1/16	<b>13191</b>	<b>93678</b>	9/32			.2812	1-1/2	2-11/16	<b>13233</b>	<b>93720</b>	
		23	.1540	1	2-1/16	<b>13192</b>	<b>93679</b>		L		.2900	1-9/16	2-3/4	<b>13234</b>	<b>93721</b>	
				.1562	1	2-1/16	<b>13193</b>	<b>93680</b>		M		.2950	1-9/16	2-3/4	<b>13235</b>	<b>93722</b>
11/64		22	.1570	1-1/16	2-1/8	<b>13194</b>	<b>93681</b>	19/64			.2969	1-9/16	2-3/4	<b>13236</b>	<b>93723</b>	
		21	.1590	1-1/16	2-1/8	<b>13195</b>	<b>93682</b>		N		.3020	1-5/8	2-13/16	<b>13237</b>	<b>93724</b>	
		20	.1610	1-1/16	2-1/8	<b>13196</b>	<b>93683</b>	5/16			.3125	1-5/8	2-13/16	<b>13238</b>	<b>93725</b>	
		19	.1660	1-1/16	2-1/8	<b>13197</b>	<b>93684</b>		O		.3160	1-11/16	2-15/16	<b>13239</b>	<b>93726</b>	
		18	.1695	1-1/16	2-1/8	<b>13198</b>	<b>93685</b>		P		.3230	1-11/16	2-15/16	<b>13240</b>	<b>93727</b>	
3/16		17	.1719	1-1/16	2-1/8	<b>13199</b>	<b>93686</b>	21/64			.3281	1-11/16	2-15/16	<b>13241</b>	<b>93728</b>	
		16	.1730	1-1/8	2-3/16	<b>13200</b>	<b>93687</b>		Q		.3320	1-11/16	3	<b>13242</b>	<b>93729</b>	
		15	.1770	1-1/8	2-3/16	<b>13201</b>	<b>93688</b>		R		.3390	1-11/16	3	<b>13243</b>	<b>93730</b>	
		14	.1800	1-1/8	2-3/16	<b>13202</b>	<b>93689</b>	11/32			.3437	1-11/16	3	<b>13244</b>	<b>93731</b>	
				.1820	1-1/8	2-3/16	<b>13203</b>	<b>93690</b>		S		.3480	1-3/4	3-1/16	<b>13245</b>	<b>93732</b>
13/64		13	.1850	1-1/8	2-3/16	<b>13204</b>	<b>93691</b>		T		.3580	1-3/4	3-1/16	<b>13246</b>	<b>93733</b>	
				.1875	1-1/8	2-3/16	<b>13205</b>	<b>93692</b>	23/64			.3594	1-3/4	3-1/16	<b>13247</b>	<b>93734</b>
		12	.1890	1-3/16	2-1/4	<b>13206</b>	<b>93693</b>		U		.3680	1-13/16	3-1/8	<b>13248</b>	<b>93735</b>	
		11	.1910	1-3/16	2-1/4	<b>13207</b>	<b>93694</b>	3/8			.3750	1-13/16	3-1/8	<b>13249</b>	<b>93736</b>	
		10	.1935	1-3/16	2-1/4	<b>13208</b>	<b>93695</b>		V		.3770	1-7/8	3-1/4	<b>13250</b>	<b>93737</b>	
7/32		9	.1960	1-3/16	2-1/4	<b>13209</b>	<b>93696</b>		W		.3860	1-7/8	3-1/4	<b>13251</b>	<b>93738</b>	
		8	.1990	1-3/16	2-1/4	<b>13210</b>	<b>93697</b>	25/64			.3906	1-7/8	3-1/4	<b>13252</b>	<b>93739</b>	
		7	.2010	1-3/16	2-1/4	<b>13211</b>	<b>93698</b>		X		.3970	1-15/16	3-5/16	<b>13253</b>	<b>93740</b>	
				.2031	1-3/16	2-1/4	<b>13212</b>	<b>93699</b>		Y		.4040	1-15/16	3-5/16	<b>13254</b>	<b>93741</b>
		6	.2040	1-1/4	2-3/8	<b>13213</b>	<b>93700</b>	13/32			.4062	1-15/16	3-5/16	<b>13255</b>	<b>93742</b>	
A		5	.2055	1-1/4	2-3/8	<b>13214</b>	<b>93701</b>		Z		.4130	2	3-3/8	<b>13256</b>	<b>93743</b>	
		4	.2090	1-1/4	2-3/8	<b>13215</b>	<b>93702</b>	27/64			.4219	2	3-3/8	<b>13257</b>	<b>93744</b>	
		3	.2130	1-1/4	2-3/8	<b>13216</b>	<b>93703</b>	7/16			.4375	2-1/16	3-7/16	<b>13258</b>	<b>93745</b>	
				.2188	1-1/4	2-3/8	<b>13217</b>	<b>93704</b>	29/64			.4531	2-1/8	3-9/16	<b>13259</b>	<b>93746</b>
		2	.2210	1-5/16	2-7/16	<b>13218</b>	<b>93705</b>	15/32			.4687	2-1/8	3-5/8	<b>13260</b>	<b>93747</b>	
	1	.2280	1-5/16	2-7/16	<b>13219</b>	<b>93706</b>	31/64			.4844	2-3/16	3-11/16	<b>13261</b>	<b>93748</b>		
			.2340	1-5/16	2-7/16	<b>13220</b>	<b>93707</b>	1/2			.5000	2-1/4	3-3/4	<b>13262</b>	<b>93749</b>	

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# 1/2" Reduced Shank Silver & Deming Drills

## 118° Point - High Speed Steel

Expand the size range capacity of 1/2" drill chucks. Recommended for drilling a wide range of materials of low to medium tensile strength.

**STANDARD PACKAGE** All sizes — 1 each



**List No. 1424R**  
Round Shank

**List No. 1424\***  
3-Flat Shank for positive hold



**List No. 1424S**  
Ambore™ - Gold & Black Finish

3-Flat Shank for positive hold.  
118° Self-Centering Split Point reduces "wandering" and thrust.

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	LIST 1424R EDP NO.	LIST 1424* EDP NO.	LIST 1424S EDP NO.
33/64	.5156	3 1/8	6	17031	—	19031
17/32	.5312	3 1/8	6	17032	—	19032
35/64	.5469	3 1/8	6	17033	—	19033
9/16	.5625	3 1/8	6	17034	—	19034
37/64	.5781	3 1/8	6	17035	—	19035
19/32	.5938	3 1/8	6	17036	—	19036
39/64	.6094	3 1/8	6	17037	15077*	19037
5/8	.6250	3 1/8	6	17038	—	19038
41/64	.6406	3 1/8	6	17039	—	19039
21/32	.6562	3 1/8	6	17040	—	19040
43/64	.6719	3 1/8	6	17041	15079*	19041
11/16	.6875	3 1/8	6	17042	—	19042
45/64	.7031	3 1/8	6	17043	—	19043
23/32	.7188	3 1/8	6	17044	—	19044
47/64	.7344	3 1/8	6	17045	—	19045
3/4	.7500	3 1/8	6	17046	—	19046
49/64	.7656	3 1/8	6	17047	—	19047
25/32	.7812	3 1/8	6	17048	—	19048
51/64	.7969	3 1/8	6	17049	—	19049
13/16	.8125	3 1/8	6	17050	—	19050
53/64	.8281	3 1/8	6	17051	15084*	19051
27/32	.8438	3 1/8	6	17052	—	19052
55/64	.8594	3 1/8	6	17053	—	19053
7/8	.8750	3 1/8	6	17054	—	19054
57/64	.8902	3 1/8	6	17055	—	19055
29/32	.9062	3 1/8	6	17056	15066*	19056
59/64	.9219	3 1/8	6	17057	—	19057
15/16	.9375	3 1/8	6	17058	15067*	19058
61/64	.9531	3 1/8	6	17059	15088*	19059
31/32	.9688	3 1/8	6	17060	—	19060
63/64	.9844	3 1/8	6	17061	—	19061
1	1.0000	3 1/8	6	17062	—	19062
1 1/64	1.0156	3 1/8	6	17063	—	19063
1 1/32	1.0312	3 1/8	6	17064	15095*	19064
1 3/64	1.0469	3 1/8	6	17065	—	—
1 1/16	1.0625	3 1/8	6	17066	15070*	19065
1 5/64	1.0781	3 1/8	6	17067	—	—
1 3/32	1.0937	3 1/8	6	17068	—	19066
1 7/64	1.1094	3 1/8	6	17069	—	—
1 1/8	1.1250	3 1/8	6	17070	—	19067
1 9/64	1.1406	3 1/8	6	17071	—	—
1 5/32	1.1562	3 1/8	6	17072	—	19068
1 11/64	1.1719	3 1/8	6	17073	—	—
1 3/16	1.1875	3 1/8	6	17074	15072*	19069
1 13/64	1.2031	3 1/8	6	17075	—	—
1 7/32	1.2188	3 1/8	6	17076	—	19070
1 15/64	1.2344	3 1/8	6	17077	—	—
1 1/4	1.2500	3 1/8	6	17078	—	19071
1 17/64	1.2656	3 1/8	6	17079	—	—
1 9/32	1.2812	3 1/8	6	17080	—	—
1 19/64	1.2969	3 1/8	6	17081	—	—
1 5/16	1.3125	3 1/8	6	17082	—	19072

\*Available While Supplies Last

(continued)

# 1/2" Reduced Shank Silver & Deming Drills (continued)

List No. 1424, 1424R, 1424S

Foret à tige réduite

Broca de zanco reducido

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	LIST 1424R EDP NO.	LIST 1424* EDP NO.	LIST 1424S EDP NO.
1 <sup>21</sup> / <sub>64</sub>	1.3281	3 <sup>1</sup> / <sub>8</sub>	6	17083	—	—
1 <sup>11</sup> / <sub>32</sub>	1.3438	3 <sup>1</sup> / <sub>8</sub>	6	17084	—	—
1 <sup>23</sup> / <sub>64</sub>	1.3594	3 <sup>1</sup> / <sub>8</sub>	6	17085	—	—
1 <sup>3</sup> / <sub>8</sub>	1.3750	3 <sup>1</sup> / <sub>8</sub>	6	17086	—	19073
1 <sup>25</sup> / <sub>64</sub>	1.3906	3 <sup>1</sup> / <sub>8</sub>	6	17087	—	—
1 <sup>13</sup> / <sub>32</sub>	1.4062	3 <sup>1</sup> / <sub>8</sub>	6	17088	—	—
1 <sup>27</sup> / <sub>64</sub>	1.4219	3 <sup>1</sup> / <sub>8</sub>	6	17089	—	—
1 <sup>7</sup> / <sub>16</sub>	1.4375	3 <sup>1</sup> / <sub>8</sub>	6	17090	15092*	19074
1 <sup>29</sup> / <sub>64</sub>	1.4531	3 <sup>1</sup> / <sub>8</sub>	6	17091	—	—
1 <sup>15</sup> / <sub>32</sub>	1.4687	3 <sup>1</sup> / <sub>8</sub>	6	17092	—	—
1 <sup>31</sup> / <sub>64</sub>	1.4844	3 <sup>1</sup> / <sub>8</sub>	6	17093	—	—
1 <sup>1</sup> / <sub>2</sub>	1.5000	3 <sup>1</sup> / <sub>8</sub>	6	17094	—	19075

\*Available While Supplies Last

## Cobalt 1/2" Reduced Shank Silver & Deming Drills

### 130° Helical Point

Heavy duty construction. Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials and materials that generate higher cutting temperatures including high alloy steels, ferrous castings, titanium, Inconel, stainless steels and other difficult-to-drill materials.

**STANDARD PACKAGE** All sizes — 1 each

Foret au cobalt

Broca de cobalto



List No. 2424

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
2 <sup>5</sup> / <sub>32</sub>	.7812	3 <sup>1</sup> / <sub>8</sub>	6	15273*
2 <sup>7</sup> / <sub>32</sub>	.8437	3 <sup>1</sup> / <sub>8</sub>	6	15275*
7 <sup>8</sup>	.8750	3 <sup>1</sup> / <sub>8</sub>	6	15276*
1 <sup>5</sup> / <sub>16</sub>	.9375	3 <sup>1</sup> / <sub>8</sub>	6	15278*

\*Available While Supplies Last

## Ambore™ Mighty Bite™ Hole Enlarger

### 4 Flute - 118° Chamfer

Specifically designed to enlarge holes, preventing hogging usually experienced when using S&D drills. The four flute design offers a good surface finish, improved hole accuracy and allows for increased metal removal rates.

Manufactured with premium tool steel, unique gold and black finish, close tolerance, and 3-flat reduced shanks.

Foret aléteur

Broca sacanúcleos



List No. 1458

**Will not drill solid material.**

**STANDARD PACKAGE** All sizes — 1 each

SIZE	MIN. STARTING HOLE SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
3 <sup>8</sup>	1 <sup>4</sup>	.3750	3 <sup>8</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16170
1 <sup>2</sup>	5 <sup>16</sup>	.5000	1 <sup>2</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16171
9 <sup>16</sup>	3 <sup>8</sup>	.5625	1 <sup>2</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16172
5 <sup>8</sup>	2 <sup>5</sup> / <sub>64</sub>	.6250	1 <sup>2</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16173
1 <sup>1</sup> / <sub>16</sub>	7 <sup>16</sup>	.6875	1 <sup>2</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16174
3 <sup>4</sup>	1 <sup>5</sup> / <sub>32</sub>	.7500	1 <sup>2</sup>	1 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	16175

# 1/4" Reduced Shank Metalworking Drills

118° Notched Point — High Speed Steel  
Bright Finish

Regularly furnished with 118° notched points for use in sheet metal, metal or wood, with portable drills having 1/4" chucks.

Screw machine length for enhanced rigidity, self-centering.

**STANDARD PACKAGE** 1/4" thru 3/8" — 12 each  
13/32" thru 1/2" — 6 each

Foret à tige réduite

Broca de zanco reducido



List No. 1414

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/4	.2500	1 3/8	2 1/2	15021*
9/32	.2812	1 1/4	2 11/16	15022*
11/32	.3438	1 9/16	3	15024*
13/32	.4062	1 7/8	3 5/16	15026*
15/32	.4688	2 1/8	3 3/8	15028*

\* Available While Supplies Last

# 3/8" Reduced Shank Jobber Length Drills

118° Point — High Speed Steel  
Black Oxide Treated

For 3/8" chuck power drills in portable applications.

Foret à tige réduite

Broca de zanco reducido



List No. 1422

**STANDARD PACKAGE** All sizes — 6 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
25/64	.3906	3 3/4	5 1/8	15001
13/32	.4062	3 7/8	5 1/4	15002
27/64	.4219	3 15/16	5 3/8	15003
7/16	.4375	4 1/16	5 1/2	15004

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
29/64	.4531	4 3/16	5 5/8	15005
15/32	.4687	4 9/16	5 3/4	15006
31/64	.4844	4 3/8	5 7/8	15007
1/2	.5000	4 1/2	6	15008

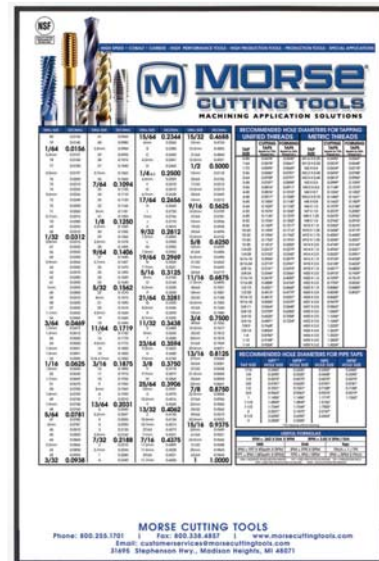
# Morse® Plastic Wall Chart

Tableau mural

Tabla mural

NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650



# Taper Length Drills

**Straight Shank – High Speed Steel**  
**118° Point – Black Oxide Treated**  
**General Purpose**

Taper length drills have approximately the same flute lengths and overall lengths as taper shank drills, for deeper hole drilling. Shanks are the same diameter as the drill body. Recommended for drilling a wide range of materials.

Foret long

Broca cónica larga



**List No. 1314 Fractional**  
**List No. 1322 Wire Gage**

**STANDARD PACKAGE**    **Fractional Sizes**  
 3/64" thru 15/64" — 12 each  
 1/4" thru 3/8" — 6 each  
 25/64" and over — 1 each

**Wire Gage Sizes**  
 #1 thru #60 — 12 each

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	1314, 1322 EDP NO.
		60	.0400	1 1/8	2 1/4	11051
		59	.0410	1 1/8	2 1/4	11052
		58	.0420	1 1/8	2 1/4	11053
		57	.0430	1 1/8	2 1/4	11054
		56	.0465	1 1/8	2 1/4	11055
3/64			.0469	1 1/8	2 1/4	10553
		55	.0520	1 3/4	3	11056
		54	.0550	1 3/4	3	11057
		53	.0595	1 3/4	3	11058
1/16			.0625	1 3/4	3	10554
		52	.0635	2	3 3/4	11059
		51	.0670	2	3 3/4	11060
		50	.0700	2	3 3/4	11061
		49	.0730	2	3 3/4	11062
		48	.0760	2	3 3/4	11063
5/64			.0781	2	3 3/4	10555
		47	.0785	2 1/4	4 1/4	11064
		46	.0810	2 1/4	4 1/4	11065
		45	.0820	2 1/4	4 1/4	11066
		44	.0860	2 1/4	4 1/4	11067
		43	.0890	2 1/4	4 1/4	11068
		42	.0935	2 1/4	4 1/4	11069
3/32			.0938	2 1/4	4 1/4	10556
		41	.0960	2 1/2	4 5/8	11070
		40	.0980	2 1/2	4 5/8	11071
		39	.0995	2 1/2	4 5/8	11072
		38	.1015	2 1/2	4 5/8	11073
		37	.1040	2 1/2	4 5/8	11074
		36	.1065	2 1/2	4 5/8	11075
7/64			.1094	2 1/2	4 5/8	10557
		35	.1100	2 3/4	5 1/8	11076
		34	.1110	2 3/4	5 1/8	11077
		33	.1130	2 3/4	5 1/8	11078
		32	.1160	2 3/4	5 1/8	11079
		31	.1200	2 3/4	5 1/8	11080
1/8			.1250	2 3/4	5 1/8	10558
		30	.1285	3	5 3/8	11081
		29	.1360	3	5 3/8	11082
		28	.1405	3	5 3/8	11083
9/64			.1406	3	5 3/8	10559
		27	.1440	3	5 3/8	11084
		26	.1470	3	5 3/8	11085
		25	.1495	3	5 3/8	11086

(continued)

## Taper Length Drills (continued)

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List No. 1314, 1322

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	1314, 1322 EDP NO.
5/32		24	.1520	3	5 3/8	11087
		23	.1540	3	5 3/8	11088
			.1562	3	5 3/8	10560
		22	.1570	3 3/8	5 3/4	11089
		21	.1590	3 3/8	5 3/4	11090
11/64		20	.1610	3 3/8	5 3/4	11091
		19	.1660	3 3/8	5 3/4	11092
		18	.1695	3 3/8	5 3/4	11093
			.1719	3 3/8	5 3/4	10561
		17	.1730	3 3/8	5 3/4	11094
3/16		16	.1770	3 3/8	5 3/4	11095
		15	.1800	3 3/8	5 3/4	11096
		14	.1820	3 3/8	5 3/4	11097
		13	.1850	3 3/8	5 3/4	11098
			.1875	3 3/8	5 3/4	10562
13/64		12	.1890	3 3/8	6	11099
		11	.1910	3 3/8	6	11100
		10	.1935	3 3/8	6	11101
		9	.1960	3 3/8	6	11102
		8	.1990	3 3/8	6	11103
7/32		7	.2010	3 3/8	6	11104
			.2031	3 3/8	6	10563
		6	.2040	3 3/8	6	11105
		5	.2055	3 3/8	6	11106
		4	.2090	3 3/8	6	11107
15/64		3	.2130	3 3/8	6	11108
			.2188	3 3/8	6	10564
		2	.2210	3 3/4	6 1/8	11109
1/4		1	.2280	3 3/4	6 1/8	11110
			.2344	3 3/4	6 1/8	10565
17/64			.2500	3 3/4	6 1/8	10566
9/32			.2656	3 7/8	6 1/4	10567
19/64			.2812	3 7/8	6 1/4	10568
5/16			.2969	4	6 3/8	10569
21/64			.3125	4	6 3/8	10570
11/32			.3281	4 1/8	6 1/2	10571
23/64			.3438	4 1/8	6 1/2	10572
3/8			.3594	4 1/4	6 3/4	10573
25/64			.3750	4 1/4	6 3/4	10574
13/32			.3906	4 3/8	7	10575
27/64			.4062	4 3/8	7	10576
7/16			.4219	4 5/8	7 1/4	10577
29/64			.4375	4 5/8	7 1/4	10578
15/32			.4531	4 3/4	7 1/2	10579
31/64			.4688	4 3/4	7 1/2	10580
1/2			.4844	4 3/4	7 3/4	10581
33/64			.5000	4 3/4	7 3/4	10582
17/32			.5156	4 3/4	8	10583
35/64			.5312	4 3/4	8	10584
9/16			.5469	4 7/8	8 1/4	10585
37/64			.5625	4 7/8	8 1/4	10586
19/32			.5781	4 7/8	8 3/4	10587
39/64			.5938	4 7/8	8 3/4	10588
5/8			.6094	4 7/8	8 3/4	10589
41/64			.6250	4 7/8	8 3/4	10590
			.6406	5 1/8	9	10591

(continued)



# Taper Length Drills (continued)

List No. 1314

SIZE FRAC- TIONAL	DEC. EQUIV.	FLUTE LENGTH	OAL	1314 EDP NO.
21/32	.6562	5 1/8	9	10592
43/64	.6719	5 3/8	9 1/4	10593
11/16	.6875	5 3/8	9 1/4	10594
45/64	.7031	5 5/8	9 1/2	10595
23/32	.7188	5 5/8	9 1/2	10596
47/64	.7344	5 7/8	9 3/4	10597
3/4	.7500	5 7/8	9 3/4	10598
49/64	.7656	6	9 7/8	10599
25/32	.7812	6	9 7/8	10600
51/64	.7969	6 1/8	10	10601
13/16	.8125	6 1/8	10	10602
53/64	.8281	6 1/8	10	10603
27/32	.8438	6 1/8	10	10604
55/64	.8594	6 1/8	10	10605
7/8	.8750	6 1/8	10	10606
57/64	.8906	6 1/8	10	10607
29/32	.9062	6 1/8	10	10608
59/64	.9219	6 1/8	10 3/4	10609
15/16	.9375	6 1/8	10 3/4	10610
61/64	.9531	6 3/8	11	10611
31/32	.9688	6 3/8	11	10612
63/64	.9844	6 3/8	11	10613
1	1.0000	6 3/8	11	10614
1 1/64	1.0156	6 1/2	11 1/8	10615
1 1/32	1.0312	6 1/2	11 1/8	10616

\*Available While Supplies Last

## Coolant Hole Drills

**Straight Shank — High Speed Steel**  
**118° Notched Point — Black Oxide Treated**  
**Taper Length**

Heavy duty construction. Low 14° helix angle is recommended for harder materials and improved chip ejection in horizontal applications. Coolant fed to the drill point reduces friction and heat, enhances chip ejection, permits higher feed rates and extends tool life. Recommended for all production work, especially deep hole drilling, in a wide variety of materials.

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
9/16	.5625	5 3/8	8 1/4	16313*
23/32	.7188	6 3/16	9 1/2	16323*
25/32	.7812	6 1/2	9 7/8	16327*
27/32	.8438	6 3/4	10 1/4	16331*
29/32	.9062	7	10 5/8	16335*
31/32	.9688	7 1/8	10 7/8	16339*
1	1.0000	7 3/16	11	16341*
1 1/32	1.0312	7 5/16	11 1/8	16342*
1 1/16	1.0625	7 3/8	11 1/4	16343*

\*Available While Supplies Last

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SIZE FRAC- TIONAL	DEC. EQUIV.	FLUTE LENGTH	OAL	1314 EDP NO.
1 3/64	1.0469	6 5/8	11 1/4	10617
1 1/16	1.0625	6 5/8	11 1/4	10618
1 5/64	1.0781	6 7/8	11 1/2	10619
1 3/32	1.0938	6 7/8	11 1/2	10620
1 7/64	1.1094	7 1/8	11 3/4	10621
1 1/8	1.1250	7 1/8	11 3/4	10622
1 9/64	1.1406	7 1/4	11 7/8	10623
1 5/32	1.1562	7 1/4	11 7/8	10624
1 11/64	1.1719	7 3/8	12	10625
1 3/16	1.1875	7 3/8	12	10626
1 13/64	1.2031	7 1/2	12 1/8	10627
1 7/32	1.2188	7 1/2	12 1/8	10628
1 15/64	1.2344	7 7/8	12 1/2	10629
1 1/4	1.2500	7 7/8	12 1/2	10630
1 5/16	1.3125	8 5/8	14 1/4	10632
1 3/8	1.3750	8 7/8	14 1/2	10634
1 7/16	1.4375	9 1/8	14 3/4	10636
1 15/32	1.4688	9 1/4	14 7/8	10637
1 1/2	1.5000	9 3/8	15	10638
1 9/16	1.5625	9 5/8	15 1/4	10639
1 5/8	1.6250	9 7/8	15 5/8	10640*

Foret à trou de refroidissement  
 Broca con orificios de refrigeración



List No. 1479

**STANDARD PACKAGE** All Sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1 3/32	1.0938	7 5/8	11 1/2	16344*
1 1/8	1.1250	7 7/8	11 3/4	16345*
1 5/32	1.1562	8	11 7/8	16346*
1 7/32	1.2188	8 1/8	12 1/8	16348*
1 1/4	1.2500	8 1/2	12 1/2	16349*
1 5/16	1.3125	9 1/4	14 1/4	16350*
1 3/8	1.3750	9 1/2	14 1/2	16351*
1 7/16	1.4375	9 5/8	14 3/4	16352*
1 1/2	1.5000	9 7/8	15	16353*

# Automotive Taper Length Drills

**Straight Shank — High Speed Steel**  
**118° Point — Black Oxide Treated**

Designed for high production drilling of a wide variety of materials. Tanged shank allows for use with ASA split sleeve drivers.

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/8	.1250	2 3/4	5 1/8	<b>10808</b>
9/64	.1406	3	5 3/8	<b>10809</b>
5/32	.1562	3	5 3/8	<b>10810</b>
11/64	.1719	3 3/8	5 3/4	<b>10811</b>
3/16	.1875	3 3/8	5 3/4	<b>10812</b>
13/64	.2031	3 5/8	6	<b>10813</b>
7/32	.2187	3 5/8	6	<b>10814</b>
15/64	.2344	3 3/4	6 1/8	<b>10815</b>
1/4	.2500	3 3/4	6 1/8	<b>10816</b>
17/64	.2656	3 7/8	6 1/4	<b>10817</b>
9/32	.2812	3 7/8	6 1/4	<b>10818</b>
19/64	.2969	4	6 3/8	<b>10819</b>
5/16	.3125	4	6 3/8	<b>10820</b>
21/64	.3281	4 1/8	6 1/2	<b>10821</b>
11/32	.3437	4 1/8	6 1/2	<b>10822</b>
23/64	.3594	4 1/4	6 3/4	<b>10823</b>

\* Available While Supplies Last

# Heavy Duty Taper Length Drills

**Straight Shank — High Speed Steel**  
**118° Point — Black Oxide Treated**

Heavy duty construction. Recommended for tough drilling applications including alloy steels, steel forgings and other medium to high tensile strength materials. Flute length 20% longer for deeper holes and more regrinds. Tanged shank allows use with ASA split sleeve drivers.

SIZE	SHANK DIA.	FITS DRILL DRIVER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/8	1/8	1	.1250	3 3/8	5 1/8	<b>11008</b>
9/64	9/64	1	.1406	3 5/8	5 3/8	<b>11009*</b>
5/32	5/32	1	.1562	3 3/4	5 3/8	<b>11010</b>
3/16	3/16	1	.1875	4 1/8	5 3/4	<b>11012</b>
13/64	13/64	1	.2031	4 3/8	6	<b>11013</b>
7/32	7/32	1	.2188	4 3/8	6	<b>11014</b>
15/64	15/64	1	.2344	4 13/16	6 1/8	<b>11015</b>
1/4	1/4	1	.2500	4 13/16	6 1/8	<b>11016</b>
9/32	9/32	1	.2812	5	6 1/4	<b>11018*</b>
19/64	19/64	1	.2969	5 1/8	6 3/8	<b>11019*</b>
5/16	5/16	1	.3125	5 1/8	6 3/8	<b>11020</b>
11/32	11/32	2	.3438	5 1/4	6 1/2	<b>11022*</b>
3/8	3/8	2	.3750	5 3/8	6 3/4	<b>11024</b>
25/64	25/64	2	.3906	5 5/8	7	<b>11025</b>

\* Available While Supplies Last

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## List No. 1314A - Tanged Shank

**STANDARD** 1/8" thru 15/64" — 12 each  
**PACKAGE** 1/4" thru 3/8" — 6 each  
25/64" and over — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
3/8	.3750	4 1/4	6 3/4	<b>10824</b>
25/64	.3906	4 3/8	7	<b>10825</b>
13/32	.4062	4 3/8	7	<b>10826</b>
27/64	.4219	4 5/8	7 1/4	<b>10827</b>
7/16	.4375	4 5/8	7 1/4	<b>10828</b>
29/64	.4531	4 3/4	7 1/2	<b>10829</b>
15/32	.4687	4 3/4	7 1/2	<b>10830</b>
31/64	.4844	4 3/4	7 3/4	<b>10831</b>
1/2	.5000	4 3/4	7 3/4	<b>10832</b>
33/64	.5156	4 3/4	8	<b>10833*</b>
17/32	.5312	4 3/4	8	<b>10834</b>
19/32	.5469	4 7/8	8 3/4	<b>10838</b>
39/64	.6094	4 7/8	8 3/4	<b>10839</b>
5/8	.6250	4 7/8	8 3/4	<b>10840</b>
43/64	.6719	5 3/8	9 1/4	<b>10843*</b>
11/16	.6875	5 3/8	9 1/4	<b>10844*</b>

Foret long

Broca cónica larga



## List No. 1320 - Tanged Shank

**STANDARD** 1/8" thru 15/64" — 12 each  
**PACKAGE** 1/4" thru 3/8" — 6 each  
25/64" and over — 1 each

SIZE	SHANK DIA.	FITS DRILL DRIVER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
13/32	13/32	2	.4062	5 5/8	7	<b>11026</b>
7/16	7/16	2	.4375	5 11/16	7 1/4	<b>11028</b>
29/64	29/64	2	.4531	5 3/4	7 1/2	<b>11029*</b>
15/32	15/32	2	.4688	5 3/4	7 1/2	<b>11030*</b>
31/64	31/64	2	.4844	5 3/4	7 3/4	<b>11031</b>
1/2	1/2	2	.5000	5 3/4	7 3/4	<b>11032</b>
33/64	1/2	2	.5156	6	8	<b>11033</b>
17/32	1/2	2	.5312	6	8	<b>11034</b>
37/64	1/2	2	.5781	6 1/2	8 3/4	<b>11037</b>
19/32	1/2	2	.5938	6 1/2	8 3/4	<b>11038*</b>
5/8	1/2	2	.6250	6 1/2	8 3/4	<b>11040*</b>
11/16	5/8	3	.6875	6 7/8	9 1/4	<b>11042*</b>
3/4	3/4	3	.7500	7 3/8	9 3/4	<b>11044*</b>

# Metric

## Taper Length Drills

Straight Shank — High Speed Steel

118° Point — Black Oxide Treated

Taper length drills have approximately the same flute lengths and overall lengths as taper shank drills, for deeper hole drilling. Shanks are the same diameter as the drill body. Recommended for drilling a wide range of materials.

Foret long

Broca cónica larga



### List No. 1317

**STANDARD PACKAGE** 1.7mm thru 6.5mm — 12 each  
6.8mm thru 9.50mm — 6 each  
10.0mm thru 20.0mm — 1 each

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
1.70	.0669	-	2	-	3-3/4	17403*
1.85	.0728	-	2	-	3-3/4	17406*
1.90	.0748	-	2	-	3-3/4	17407*
1.95	.0768	-	2	-	3-3/4	17408*
2.00	.0787	56	2-13/64	85	3-11/32	17409†
2.05	.0807	-	2-1/4	-	4-1/4	17410*
2.10	.0827	-	2-1/4	-	4-1/4	17411*
2.15	.0846	-	2-1/4	-	4-1/4	17412*
2.20	.0866	-	2-1/4	-	4-1/4	17413*
2.25	.0886	-	2-1/4	-	4-1/4	17414*
2.35	.0925	59	2-21/64	90	3-35/64	17416†
2.45	.0965	-	2-1/2	-	4-5/8	17418*
2.60	.1024	-	2-1/2	-	4-5/8	17420*
2.70	.1063	-	2-1/2	-	4-5/8	17421*
3.00	.1181	66	2-19/32	100	3-15/16	17424†
3.10	.1220	-	2-3/4	-	5-1/8	17425
3.20	.1260	-	3	-	5-3/8	17426*
3.60	.1417	-	3	-	5-3/8	17430*
3.70	.1457	-	3	-	5-3/8	17431*
3.80	.1496	-	3	-	5-3/8	17432*
3.90	.1535	-	3	-	5-3/8	17433*
4.00	.1575	78	3-5/64	119	4-11/16	17434†
4.10	.1614	-	3-3/8	-	5-3/4	17435*
4.50	.1772	-	3-3/8	-	5-3/4	17439
4.70	.1850	-	3-3/8	-	5-3/4	17441*
4.80	.1890	-	3-5/8	-	6	17442*
5.00	.1968	87	3-27/64	132	5-13/64	17444†
5.60	.2205	-	3-3/4	-	6-1/8	17450*
5.90	.2323	-	3-3/4	-	6-1/8	17453*

SIZE MM	DEC. EQUIV.	FLUTE LENGTH		OAL		EDP NO.
		MM	IN.	MM	IN.	
6.00	.2362	91	3-37/64	139	5-15/32	17454†
6.50	.2559	97	3-13/16	148	5-53/64	17460†
6.80	.2677	102	4-1/64	156	6-9/64	17461†
7.00	.2756	102	4-1/64	156	6-9/64	17462†
7.20	.2835	-	4	-	6-3/8	17463*
8.00	.3150	109	4-9/32	165	6-1/2	17466†
8.20	.3228	-	4-1/8	-	6-1/2	17467*
8.50	.3346	109	4-9/32	165	6-1/2	17468†
9.00	.3543	115	4-17/32	175	6-57/64	17470†
10.00	.3937	121	4-49/64	184	7-15/64	17474†
10.20	.4016	121	4-49/64	184	7-15/64	17475†
10.50	.4134	121	4-49/64	184	7-15/64	17476†
11.00	.4331	128	5-1/32	195	7-43/64	17478†
11.20	.4409	128	5-1/32	195	7-43/64	17479†
13.20	.5197	-	4-3/4	-	8	17487*
13.50	.5315	-	4-3/4	-	8	17488*
13.80	.5433	-	4-7/8	-	8-1/4	17489*
14.25	.5610	-	4-7/8	-	8-1/4	17491*
14.75	.5807	-	4-7/8	-	8-3/4	17493*
15.00	.5906	144	5-43/64	220	8-21/32	17494†
15.75	.6201	-	4-7/8	-	8-3/4	17497*
16.00	.6299	149	5-55/64	227	8-15/16	17498†
16.25	.6398	-	5-1/8	-	9	17499*
16.75	.6594	-	5-3/8	-	9-1/4	17501*
17.00	.6693	149	5-55/64	235	9-1/4	17502†
17.25	.6791	-	5-3/8	-	9-1/4	17503*
18.00	.7087	143	5-5/8	241	9-31/64	17505†
18.50	.7283	-	5-7/8	-	9-3/4	17506*
20.00	.7874	156	6-9/64	254	10	17509†

\*Available While Supplies Last

†Replenishment to DIN 338 Lengths

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# High Helix Taper Length Drills

**Straight Shank — High Speed Steel**  
**118° Point — Bright Finish**

High Helix drills are recommended for deep hole drilling in low tensile strength materials such as aluminum, magnesium, zinc, copper, soft steels and some plastics. Wide polished flutes and a high helix angle enhance chip ejection.

Foret long

Broca cónica larga



List No. 1325

**STANDARD PACKAGE** Fractional Sizes  
1/16" thru 15/64" — 12 each  
1/4" thru 3/8" — 6 each  
25/64" and over — 1 each

**Wire Gage Sizes**  
#1 thru #60 — 12 each

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	60	.0400	1 1/8	2 1/4	11201
	59	.0410	1 1/8	2 1/4	11202
	58	.0420	1 1/8	2 1/4	11203
	57	.0430	1 1/8	2 1/4	11204
	56	.0465	1 1/8	2 1/4	11205
	55	.0520	1 3/4	3	11206
	54	.0550	1 3/4	3	11207
	53	.0595	1 3/4	3	11208
1/16		.0625	1 3/4	3	11209
	52	.0635	2	3 3/4	11210
	51	.0670	2	3 3/4	11211
	50	.0700	2	3 3/4	11212
	49	.0730	2	3 3/4	11213
	48	.0760	2	3 3/4	11214
5/64		.0781	2	3 3/4	11215
	47	.0785	2 1/4	4 1/4	11216
	46	.0810	2 1/4	4 1/4	11217
	45	.0820	2 1/4	4 1/4	11218
	44	.0860	2 1/4	4 1/4	11219
	43	.0890	2 1/4	4 1/4	11220
	42	.0935	2 1/4	4 1/4	11221
		.0937	2 1/4	4 1/4	11222
3/32		.0960	2 1/2	4 5/8	11223
	41	.0980	2 1/2	4 5/8	11224
	40	.0980	2 1/2	4 5/8	11224
	39	.0995	2 1/2	4 5/8	11225
	38	.1015	2 1/2	4 5/8	11226
	37	.1040	2 1/2	4 5/8	11227
	36	.1065	2 1/2	4 5/8	11228
7/64		.1094	2 1/2	4 5/8	11229
	35	.1100	2 3/4	5 1/8	11230
	34	.1110	2 3/4	5 1/8	11231
	33	.1130	2 3/4	5 1/8	11232
	32	.1160	2 3/4	5 1/8	11233
	31	.1200	2 3/4	5 1/8	11234
1/8		.1250	2 3/4	5 1/8	11235
	30	.1285	3	5 3/8	11236
	29	.1360	3	5 3/8	11237
	28	.1405	3	5 3/8	11238
9/64		.1406	3	5 3/8	11239
	27	.1440	3	5 3/8	11240
	26	.1470	3	5 3/8	11241
	25	.1495	3	5 3/8	11242
	24	.1520	3	5 3/8	11243
	23	.1540	3	5 3/8	11244
5/32		.1562	3	5 3/8	11245

SIZE					
FRAC-TIONAL	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
	22	.1570	3 3/8	5 3/4	11246
	21	.1590	3 3/8	5 3/4	11247
	20	.1610	3 3/8	5 3/4	11248
	19	.1660	3 3/8	5 3/4	11249
	18	.1695	3 3/8	5 3/4	11250
11/64		.1719	3 3/8	5 3/4	11251
	17	.1730	3 3/8	5 3/4	11252
	16	.1770	3 3/8	5 3/4	11253
	15	.1800	3 3/8	5 3/4	11254
	14	.1820	3 3/8	5 3/4	11255
	13	.1850	3 3/8	5 3/4	11256
3/16		.1875	3 3/8	5 3/4	11257
	12	.1890	3 5/8	6	11258
	11	.1910	3 5/8	6	11259
	10	.1935	3 5/8	6	11260
	9	.1960	3 5/8	6	11261
	8	.1990	3 5/8	6	11262
	7	.2010	3 5/8	6	11263
13/64		.2031	3 5/8	6	11264
	6	.2040	3 5/8	6	11265
	5	.2055	3 5/8	6	11266
	4	.2090	3 5/8	6	11267
	3	.2130	3 5/8	6	11268
7/32		.2187	3 5/8	6	11269
	2	.2210	3 3/4	6 1/8	11270
	1	.2280	3 3/4	6 1/8	11271
15/64		.2344	3 3/4	6 1/8	11272
1/4		.2500	3 3/4	6 1/8	11273
17/64		.2656	3 7/8	6 1/4	11274
9/32		.2812	3 7/8	6 1/4	11275
19/64		.2969	4	6 3/8	11276
5/16		.3125	4	6 3/8	11277
21/64		.3281	4 1/8	6 1/2	11278
11/32		.3437	4 1/8	6 1/2	11279
23/64		.3594	4 1/4	6 3/4	11280
3/8		.3750	4 1/4	6 3/4	11281
25/64		.3906	4 3/8	7	11282
13/32		.4062	4 3/8	7	11283
27/64		.4219	4 5/8	7 1/4	11284
7/16		.4375	4 5/8	7 1/4	11285
29/64		.4531	4 3/4	7 1/2	11286
15/32		.4687	4 3/4	7 1/2	11287
31/64		.4844	4 3/4	7 3/4	11288
1/2		.5000	4 3/4	7 3/4	11289

# Cobalt Heavy Duty Taper Length Drills

## Straight Shank — Cobalt

Heavy duty construction. Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials and materials that generate higher cutting temperatures including high alloy steels, ferrous castings, titanium, inconel, stainless steels and other difficult-to-drill materials.

135° Self-centering split point eliminates “walking” and reduces thrust.

Foret au cobalt

Broca de cobalto



### List No. 2314 - Fractional

$\frac{3}{32}$ " thru  $\frac{1}{2}$ " — 135° Split Point

Over  $\frac{1}{2}$ " — 118° Notched Point\*

### List No. 2322 - Wire Gage

135° Point\*

**STANDARD  
PACKAGE**

**Fractional Sizes**

3/32" thru 15/64" — 12 each

1/4" thru 3/8" — 6 each

25/64" thru 61/64" — 1 each

**Wire Gage Sizes\***

12 each

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	2314, 2322 EDP NO.
$\frac{3}{32}$			.0938	2 $\frac{1}{4}$	4 $\frac{1}{4}$	10764
$\frac{1}{8}$			.1250	2 $\frac{3}{4}$	5 $\frac{1}{8}$	10766
$\frac{9}{64}$			.1406	3	5 $\frac{3}{8}$	10767
$\frac{5}{32}$			.1562	3	5 $\frac{3}{8}$	10707
		20	.1610	3 $\frac{3}{8}$	5 $\frac{3}{4}$	10870*
$\frac{11}{64}$			.1719	3 $\frac{3}{8}$	5 $\frac{3}{4}$	10708
		15	.1800	3 $\frac{3}{8}$	5 $\frac{3}{4}$	10865*
		13	.1850	3 $\frac{3}{8}$	5 $\frac{3}{4}$	10863*
$\frac{3}{16}$			.1875	3 $\frac{3}{8}$	5 $\frac{3}{4}$	10709
		7	.2010	3 $\frac{3}{8}$	6	10857*
$\frac{13}{64}$			.2031	3 $\frac{3}{8}$	6	10710
		6	.2040	3 $\frac{3}{8}$	6	10856*
		5	.2055	3 $\frac{3}{8}$	6	10855*
$\frac{7}{32}$			.2188	3 $\frac{3}{8}$	6	10711
		2	.2210	3 $\frac{3}{4}$	6 $\frac{1}{8}$	10852*
$\frac{15}{64}$			.2344	3 $\frac{3}{4}$	6 $\frac{1}{8}$	10712
$\frac{1}{4}$			.2500	3 $\frac{3}{4}$	6 $\frac{1}{8}$	10713
$\frac{17}{64}$			.2656	3 $\frac{7}{8}$	6 $\frac{1}{4}$	10714
$\frac{9}{32}$			.2812	3 $\frac{7}{8}$	6 $\frac{1}{4}$	10715
$\frac{19}{64}$			.2969	4	6 $\frac{3}{8}$	10716
$\frac{5}{16}$			.3125	4	6 $\frac{3}{8}$	10717
$\frac{21}{64}$			.3281	4 $\frac{1}{8}$	6 $\frac{1}{2}$	10718
$\frac{11}{32}$			.3438	4 $\frac{1}{8}$	6 $\frac{1}{2}$	10719
$\frac{23}{64}$			.3594	4 $\frac{1}{4}$	6 $\frac{3}{4}$	10720
$\frac{3}{8}$			.3750	4 $\frac{1}{4}$	6 $\frac{3}{4}$	10721
$\frac{25}{64}$			.3906	4 $\frac{3}{8}$	7	10722
$\frac{13}{32}$			.4062	4 $\frac{3}{8}$	7	10723
$\frac{27}{64}$			.4219	4 $\frac{5}{8}$	7 $\frac{1}{4}$	10724
$\frac{7}{16}$			.4375	4 $\frac{5}{8}$	7 $\frac{1}{4}$	10725
$\frac{29}{64}$			.4531	4 $\frac{3}{4}$	7 $\frac{1}{2}$	10726
$\frac{15}{32}$			.4688	4 $\frac{3}{4}$	7 $\frac{1}{2}$	10727
$\frac{31}{64}$			.4844	4 $\frac{3}{4}$	7 $\frac{3}{4}$	10728
$\frac{1}{2}$			.5000	4 $\frac{3}{4}$	7 $\frac{3}{4}$	10729
$\frac{61}{64}$			.9531	6 $\frac{3}{8}$	11	10758*

\*Available While Supplies Last

# Parabolic Flute Taper Length Drills

**Straight Shank — High Speed Steel**  
**135° Split Point — Tanged Shank (1/8" & Larger)**

**Parabolic Flute** drills feature a unique flute design that greatly enhances chip flow, coolant flow to the drill point and heat dissipation in deep hole drilling greater than three diameters deep. Recommended for drilling aluminum and other low to medium tensile strength materials.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Enhanced hole quality at higher speeds and feeds.

135° Self-centering split point eliminates "walking" and reduces thrust.

Foret à goujure parabolique

Broca parabólica



List No. 1356 — Bright Finish



List No. 1356G — TiN Coated

**STANDARD PACKAGE**     **Fractional Sizes**  
1/16" thru 15/64" — 12 each  
1/4" thru 3/8" — 6 each  
25/64" and over — 1 each

**Wire Gage Sizes**  
#1 thru #40 — 12 each

FRAC-TIONAL	SIZE		DEC. EQUIV.	FLUTE LENGTH	OAL	1356	1356G
	WIRE GAGE					EDP NO.	EDP NO.
1/16			.0625	1 3/4	3	13385	93385
			.0781	2	3 3/4	13386	93386
			.0938	2 1/4	4 1/4	13387	93387
3/32		40	.0980	2 1/2	4 5/8	13461	93461
		39	.0995	2 1/2	4 5/8	13460	93460
		38	.1015	2 1/2	4 5/8	13459	93459
		37	.1040	2 1/2	4 5/8	13458	93458
		36	.1065	2 1/2	4 5/8	13457	93457
7/64			.1094	2 1/2	4 5/8	13388	93388
		35	.1100	2 3/4	5 1/8	13456	93456
		34	.1110	2 3/4	5 1/8	13455	93455
		33	.1130	2 3/4	5 1/8	13454	93454
1/8			.1160	2 3/4	5 1/8	13453	93453
			.1200	2 3/4	5 1/8	13452	93452
			.1250	3 3/8	5 1/8	13389	93389
		30	.1285	3	5 3/8	13451	93451
9/64			.1360	3	5 3/8	13450	93450
			.1405	3	5 3/8	13449	93449
			.1406	3 3/8	5 3/8	13390	93390
		27	.1440	3	5 3/8	13448	93448
		26	.1470	3	5 3/8	13447	93447
5/32			.1495	3	5 3/8	13446	93446
			.1520	3	5 3/8	13445	93445
			.1540	3	5 3/8	13444	93444
			.1562	3 3/4	5 3/8	13391	93391
		22	.1570	3 3/8	5 3/4	13443	93443
11/64			.1590	3 3/8	5 3/4	13442	93442
			.1610	3 3/8	5 3/4	13441	93441
			.1660	3 3/8	5 3/4	13440	93440
			.1695	3 3/8	5 3/4	13439	93439
		17	.1719	4 1/8	5 3/4	13392	93392
		16	.1730	3 3/8	5 3/4	13438	93438
		15	.1770	3 3/8	5 3/4	13437	93437
3/16			.1800	3 3/8	5 3/4	13436	93436
			.1820	3 3/8	5 3/4	13435	93435
		13	.1850	3 3/8	5 3/4	13434	93434
			.1875	4 1/8	5 3/4	13393	93393
		12	.1890	3 3/8	6	13433	93433
13/64			.1910	3 3/8	6	13432	93432
			.1935	3 3/8	6	13431	93431
		9	.1960	3 3/8	6	13430	93430
		8	.1990	3 3/8	6	13429	93429
		7	.2010	3 3/8	6	13428	93428
		6	.2031	4 3/8	6	13394	93394
		.2040	3 3/8	6	13427	93427	

(continued)

# Parabolic Flute Taper Length Drills (continued)

List No. 1356, 1356G

Foret à goujure parabolique

Broca parabólica

FRAC-TIONAL	SIZE WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	OAL	1356	1356G
					EDP NO.	EDP NO.
	5	.2055	3 $\frac{3}{8}$	6	13426	93426
	4	.2090	3 $\frac{3}{8}$	6	13425	93425
	3	.2130	3 $\frac{3}{8}$	6	13424	93424
7/32		.2188	4 $\frac{3}{8}$	6	13395	93395
		.2210	3 $\frac{3}{4}$	6 $\frac{1}{8}$	13423	93423
	1	.2280	3 $\frac{3}{4}$	6 $\frac{1}{8}$	13422	93422
15/64		.2344	4 $\frac{13}{16}$	6 $\frac{1}{8}$	13396	93396
1/4		.2500	4 $\frac{13}{16}$	6 $\frac{1}{8}$	13397	93397
17/64		.2656	5	6 $\frac{1}{4}$	13398	93398
9/32		.2812	5	6 $\frac{1}{4}$	13399	93399
19/64		.2969	5 $\frac{1}{8}$	6 $\frac{3}{8}$	13400	93400
9/16		.3125	5 $\frac{1}{8}$	6 $\frac{3}{8}$	13401	93401
21/64		.3281	5 $\frac{1}{4}$	6 $\frac{1}{2}$	13402	93402
11/32		.3438	5 $\frac{1}{4}$	6 $\frac{1}{2}$	13403	93403
23/64		.3594	5 $\frac{3}{8}$	6 $\frac{3}{4}$	13404	93404
3/8		.3750	5 $\frac{3}{8}$	6 $\frac{3}{4}$	13405	93405
25/64		.3906	5 $\frac{3}{8}$	7	13406	93406
13/32		.4062	5 $\frac{3}{8}$	7	13407	93407
27/64		.4219	5 $\frac{11}{16}$	7 $\frac{1}{4}$	13408	93408
7/16		.4375	5 $\frac{11}{16}$	7 $\frac{1}{4}$	13409	93409
29/64		.4531	5 $\frac{3}{4}$	7 $\frac{1}{2}$	13410	93410
15/32		.4688	5 $\frac{3}{4}$	7 $\frac{1}{2}$	13411	93411
31/64		.4844	5 $\frac{3}{4}$	7 $\frac{3}{4}$	13412	93412
1/2		.5000	5 $\frac{3}{4}$	7 $\frac{3}{4}$	13413	93413

## TOOL COATINGS

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish.

### TiN - Titanium Nitride

A good general purpose coating for a wide range of ferrous materials. Not recommended for non-ferrous materials. Has higher heat resistance than TiCN coating.

### TiCN - Titanium Carbonitride

Enhanced toughness, hardness & wear resistance for aggressive speeds & feeds. Recommended for difficult-to-machine, gummy & abrasive materials where moderate cutting temperatures are generated.

### TiAlN - Titanium Aluminum Nitride

### AlTiN - Aluminum Titanium Nitride

Excellent all around coatings featuring high heat resistance. Recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials that generate higher cutting temperatures. AlTiN has higher AL content for increased hardness & heat resistance.

### CrN - Chromium Nitride

### CrC - Chromium Carbide

Especially recommended for titanium and non-ferrous materials including aluminum, copper & brass. CrC has slightly higher hardness than CrN. These coatings resist adhesion of the material being machined and resist chipping and cracking.

### DLC - Diamond Like Carbon

A thin carbon based amorphous (non-crystalline) coating featuring very high hardness & low coefficient of friction. Highly recommended for non-ferrous materials including plastic, aluminum, copper & brass. Typically used on solid carbide tools.

# Aircraft Extension Drills

Foret pour la perforation de longs trous pour l'aviation

Broca extra larga para la industria aeronautica

**Straight Shank — High Speed Steel**  
**135° Split Point — Black Oxide Treated**



List No. 1390

6" Overall Length

List No. 1391

12" Overall Length

Drilling in mild steel where extra length is required.  
 135° split point is self-centering, and reduces thrust.

Sizes #53 and smaller furnished with 135° Regular Point

NAS 907, Type B

**STANDARD PACKAGE** Fractional Sizes  
 3/64" thru 11/32" — 12 each  
 23/64" thru 1/2" — 1 each

**Letter Sizes**  
 A thru V — 6 each  
 W thru Z — 1 each

**Wire Gage Sizes**  
 #1 thru #60 — 12 each

FRAC-TIONAL	SIZE	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	1390 EDP NO.	1391 EDP NO.
		60*	.0400	1 1/16	16673	16789
		59*	.0410	1 1/16	16672	16788
		58*	.0420	1 1/16	16671	16787
		57*	.0430	3/4	16670	16786
		56*	.0465	3/4	16669	16785
3/64*			.0469	3/4	16600	16700
		55*	.0520	7/8	16668	16784
		54*	.0550	7/8	16667	16783
		53*	.0595	7/8	16666	16782
1/16			.0625	7/8	16601	16701
		52	.0635	7/8	16665	16781
		51	.0670	1	16664	16780
		50	.0700	1	16663	16779
		49	.0730	1	16662	16778
		48	.0780	1	16661	16777
5/64			.0781	1	16602	16702
		47	.0785	1	16660	16776
		46	.0810	1 1/8	16659	16775
		45	.0820	1 1/8	16658	16774
		44	.0860	1 1/8	16657	16773
		43	.0890	1 1/4	16656	16772
		42	.0935	1 1/4	16655	16771
3/32			.0938	1 1/4	16603	16703
		41	.0960	1 3/8	16654	16770
		40	.0980	1 3/8	16653	16769
		39	.0995	1 3/8	16652	16768
		38	.1015	1 7/16	16651	16767
		37	.1040	1 7/16	16650	16766
		36	.1065	1 7/16	16649	16765
7/64			.1094	1 1/2	16604	16704
		35	.1100	1 1/2	16648	16764
		34	.1110	1 1/2	16647	16763
		33	.1130	1 1/2	16646	16762
		32	.1160	1 5/8	16645	16761
		31	.1200	1 5/8	16644	16760
1/8			.1250	1 5/8	16605	16705
		30	.1285	1 5/8	16643	16759
		29	.1360	1 3/4	16642	16758
		28	.1405	1 3/4	16641	16757
9/64			.1406	1 3/4	16606	16706
		27	.1440	1 7/8	16640	16756
		26	.1470	1 7/8	16639	16755
		25	.1495	1 7/8	16638	16754
		24	.1520	2	16637	16753
		23	.1540	2	16636	16752
5/32			.1562	2	16607	16707
		22	.1570	2	16635	16751
		21	.1590	2 1/8	16634	16750
		20	.1610	2 1/8	16633	16749

\*Note: NOT Split Point

(continued)



# Aircraft Extension Drills (continued)

List Nos. 1390 and 1391

Foret pour la perforation de longs trous pour l'aviation

Broca extra larga para la industria aeronáutica

FRAC-TIONAL	SIZE LETTER	WIRE GAGE	DEC. EQUIV.	FLUTE LENGTH	1390 EDP NO.	1391 EDP NO.
11/64		19	.1660	2 1/8	16632	16748
		18	.1695	2 1/8	16631	16747
			.1719	2 1/8	16608	16708
		17	.1730	2 3/16	16630	16746
		16	.1770	2 3/16	16629	16745
3/16		15	.1800	2 3/16	16628	16744
		14	.1820	2 3/16	16627	16743
		13	.1850	2 5/16	16626	16742
			.1875	2 5/16	16609	16709
		12	.1890	2 5/16	16625	16741
13/64		11	.1910	2 5/16	16624	16740
		10	.1935	2 7/16	16623	16739
		9	.1960	2 7/16	16622	16738
		8	.1990	2 7/16	16621	16737
		7	.2010	2 7/16	16620	16736
15/64		6	.2031	2 7/16	16610	16710
		5	.2040	2 1/2	16619	16735
		4	.2055	2 1/2	16618	16734
		3	.2090	2 1/2	16617	16733
			.2130	2 1/2	16616	16732
7/32		2	.2187	2 1/2	16611	16711
			.2210	2 5/8	16615	16731
		1	.2280	2 5/8	16614	16730
15/64	A*		.2340	2 5/8	—	16790
			.2344	2 5/8	16612	16712
1/4	B*		.2380	2 3/4	—	16791
	E		.2500	2 3/4	16613	16713
17/64			.2656	2 7/8	16584	16714
		H*	.2660	2 7/8	—	16796
9/32	J*		.2770	2 7/8	—	16798
	K*		.2810	2 15/16	—	16799
			.2812	2 15/16	16585	16715
19/64	L*		.2900	2 15/16	16684	16800
	M*		.2950	3 1/16	—	16801
			.2969	3 1/16	16586	16716
5/16	P*		.3125	3 3/16	16587	16717
			.3230	3 5/16	—	16804
21/64			.3281	3 5/16	16588	16718
			.3437	3 7/16	16589	16719
11/32	S*		.3480	3 1/2	—	16807
23/64	T*		.3580	3 1/2	—	16808
			.3594	3 1/2	16590	16720
3/8	V*		.3750	3 5/8	16591	16721
			.3770	3 5/8	16694	16810
25/64			.3906	3 3/4	16592	16722
13/32	X*		.3970	3 3/4	16696	—
	Z*		.4062	3 7/8	16593	16723
27/64			.4130	3 7/8	—	16814
			.4219	3 15/16	16594	16724
7/16			.4375	4 1/16	16595	16725
29/64			.4531	4 3/16	16596	16726
15/32			.4687	4 5/16	16597	16727
31/64			.4844	4 3/8	16598	16728
1/2			.5000	4 1/2	16599	16729

\*Available While Supplies Last

# Extra Long Straight Shank Drills

Straight Shank — High Speed Steel  
118° Notch Point

For general purpose drilling in applications where extra reach is required.

Foret extra-long

Broca extra larga



List No. 1315 - Bright Finish

STANDARD All sizes — 1 each  
PACKAGE

## 5½" Flute, 8" Overall Length

SIZE	DEC. EQUIV.	EDP NO.
1/8	.1250	10902
9/64	.1406	10905
5/32	.1562	10909
11/64	.1719	10912
3/16	.1875	10915
13/64	.2031	10920
7/32	.2188	10923
15/64	.2344	10927
1/4	.2500	10928
17/64	.2656	10932
9/32	.2812	10935
19/64	.2969	10936
5/16	.3125	10941

SIZE	DEC. EQUIV.	EDP NO.
21/64	.3281	10942
11/32	.3438	10305
23/64	.3594	10306
3/8	.3750	10951
25/64	.3906	10952
13/32	.4062	10309
27/64	.4219	10310
7/16	.4375	10961
29/64	.4531	10311
15/32	.4688	10307
31/64	.4844	10967
1/2	.5000	10308

## 7½" Flute, 10" Overall Length

SIZE	DEC. EQUIV.	EDP NO.
1/8	.1250	10903
5/32	.1562	10910
3/16	.1875	10917
7/32	.2188	10925
15/64	.2344	10929
1/4	.2500	10930
9/32	.2812	10937

SIZE	DEC. EQUIV.	EDP NO.
5/16	.3125	10943
11/32	.3438	10947
3/8	.3750	10953
13/32	.4062	10957
7/16	.4375	10962
15/32	.4688	10966
1/2	.5000	10969

## 9" Flute, 12" Overall Length

SIZE	DEC. EQUIV.	EDP NO.
1/8	.1250	10904
5/32	.1562	10911
3/16	.1875	10918
7/32	.2188	10926
1/4	.2500	10931
9/32	.2812	10938
5/16	.3125	10944
11/32	.3438	10948
3/8	.3750	10954
13/32	.4062	10958

SIZE	DEC. EQUIV.	EDP NO.
7/16	.4375	10963
15/32	.4688	10983
1/2	.5000	10971
17/32	.5312	10974
9/16	.5625	10975
19/32	.5938	10977
5/8	.6250	10978
21/32	.6562	10301
11/16	.6875	10313
23/32	.7188	10302
3/4	.7500	10303

## 14" Flute, 18" Overall Length

SIZE	DEC. EQUIV.	EDP NO.
1/4	.2500	10653
9/32	.2812	10990
5/16	.3125	10945
11/32	.3438	10657
3/8	.3750	10955
13/32	.4062	10660
7/16	.4375	10964
15/32	.4688	10663

SIZE	DEC. EQUIV.	EDP NO.
1/2	.5000	10972
39/64	.6094	10304*
13/16	1.1875	10998*

\*Available While Supplies Last

# Double End Body Drills

## High Speed Steel 135° Split Point — Black Oxide Treated

Designed for drilling auto and truck bodies and other thin sheet metal applications. 135° Self-centering split point eliminates “walking” of the drill point and reduces thrust for faster penetration.

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
7/64	.1094	9/16	17/8	<b>15010</b>
1/8	.1250	9/16	17/8	<b>15011</b>
9/64	.1406	9/16	1 <sup>15</sup> / <sub>16</sub>	<b>15012</b>
5/32	.1562	9/16	2 <sup>1</sup> / <sub>16</sub>	<b>15013</b>
3/16	.1897	9/16	2 <sup>1</sup> / <sub>16</sub>	<b>15014</b>

Foret double

Broca de doble extremo punta



List No. 1400

STANDARD PACKAGE All sizes — 12 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
7/32	.2188	1 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	<b>15015</b>
1/4	.2500	3/4	2 <sup>1</sup> / <sub>2</sub>	<b>15016</b>
11	.1910	9/16	2 <sup>7</sup> / <sub>32</sub>	<b>15017</b>
20	.1610	9/16	2 <sup>1</sup> / <sub>16</sub>	<b>15018</b>
30	.1285	9/16	1 <sup>7</sup> / <sub>8</sub>	<b>15019</b>

## DRILL-MILL™

### M42 8% Cobalt

Specially designed to perform both drilling and milling operations with the same tool in vertical milling machine applications. Increased productivity with fewer tool changes.

**DRILL-MILL performs:** drilling, spotting countersinking, chamfering, slotting, side milling, profile milling and other drilling & milling operations

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

Fraise de forage

Broca de fresado



List No. 1980

90° Point Angle  
2-Flute  
30° Right Hand Helix

Tool Coatings  
Also Available

STANDARD PACKAGE All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH* OF CUT	OAL*	EDP NO.
1/8	.1250	3/8	3/8	2 <sup>5</sup> / <sub>16</sub>	<b>44619</b>
3/16	.1875	3/8	7/16	2 <sup>5</sup> / <sub>16</sub>	<b>44620</b>
1/4	.2500	3/8	5/8	2 <sup>7</sup> / <sub>16</sub>	<b>44621</b>
5/16	.3125	3/8	2 <sup>3</sup> / <sub>32</sub>	2 <sup>15</sup> / <sub>32</sub>	<b>44622</b>
3/8	.3750	3/8	3/4	2 <sup>1</sup> / <sub>2</sub>	<b>44623</b>
7/16	.4375	3/8	1 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	<b>44624</b>
1/2	.5000	1/2	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>44625</b>
9/16	.5625	1/2	1 <sup>13</sup> / <sub>32</sub>	3 <sup>13</sup> / <sub>32</sub>	<b>44626</b>
5/8	.6250	5/8	1 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>44627</b>
11/16	.6875	5/8	1 <sup>21</sup> / <sub>32</sub>	3 <sup>25</sup> / <sub>32</sub>	<b>44628</b>
3/4	.7500	3/4	1 <sup>11</sup> / <sub>16</sub>	3 <sup>15</sup> / <sub>16</sub>	<b>44629</b>
13/16	.8125	3/4	1 <sup>29</sup> / <sub>32</sub>	4 <sup>5</sup> / <sub>32</sub>	<b>44630</b>
7/8	.8750	3/4	1 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	<b>44631</b>
15/16	.9375	3/4	1 <sup>31</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>32</sub>	<b>44632</b>
1	1.0000	3/4	2	4 <sup>1</sup> / <sub>4</sub>	<b>44633</b>

\* Lengths include the 90° conical cutting point.

# Taper Shank Drills

Foret à queue conique

Broca con zanco cónico

**Morse Taper Shank — High Speed Steel  
118° Point — Black Oxide Treated**



## General Purpose

Recommended for production work in wide variety of materials. Black Oxide Surface Treatment increases wear resistance, reduces galling and chip welding, improves chip flow and increases drill lubricant retention. Standard series shanks furnished unless otherwise specified.

List No. 1302

**STANDARD PACKAGE** All sizes — 1 each

## Standard Morse Taper Shank Drills

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1/8	1	.1250	1 7/8	5 1/8	10008
9/64	1	.1406	2 1/8	5 3/8	10009
5/32	1	.1562	2 1/8	5 3/8	10010
11/64	1	.1719	2 1/2	5 3/4	10011
3/16	1	.1875	2 1/2	5 3/4	10012
13/64	1	.2031	2 3/4	6	10013
7/32	1	.2188	2 3/4	6	10014
15/64	1	.2344	2 3/4	6 1/8	10015
1/4	1	.2500	2 7/8	6 1/8	10016
17/64	1	.2656	3	6 1/4	10017
9/32	1	.2812	3	6 1/4	10018
19/64	1	.2969	3 1/8	6 3/8	10019
5/16	1	.3125	3 1/8	6 3/8	10020
21/64	1	.3281	3 1/4	6 1/2	10021
11/32	1	.3438	3 1/4	6 1/2	10022
23/64	1	.3594	3 1/2	6 3/4	10023
3/8	1	.3750	3 1/2	6 3/4	10024
25/64	1	.3906	3 5/8	7	10025
13/32	1	.4062	3 5/8	7	10026
27/64	1	.4219	3 7/8	7 1/4	10027
7/16	1	.4375	3 7/8	7 1/4	10028
29/64	1	.4531	4 1/8	7 1/2	10029
15/32	1	.4688	4 1/8	7 1/2	10030
31/64	2	.4844	4 3/8	8 1/4	10031
1/2	2	.5000	4 3/8	8 1/4	10032
33/64	2	.5156	4 5/8	8 1/2	10033
17/32	2	.5312	4 5/8	8 1/2	10034
35/64	2	.5469	4 7/8	8 3/4	10035
9/16	2	.5625	4 7/8	8 3/4	10036
37/64	2	.5781	4 7/8	8 3/4	10037
19/32	2	.5938	4 7/8	8 3/4	10038
39/64	2	.6094	4 7/8	8 3/4	10039
5/8	2	.6250	4 7/8	8 3/4	10040
41/64	2	.6406	5 1/8	9	10041
21/32	2	.6562	5 1/8	9	10042
43/64	2	.6719	5 3/8	9 1/4	10043
11/16	2	.6875	5 3/8	9 1/4	10044
45/64	2	.7031	5 3/8	9 1/2	10045
23/32	2	.7188	5 3/8	9 1/2	10046
47/64	2	.7344	5 7/8	9 3/4	10047
3/4	2	.7500	5 7/8	9 3/4	10048
49/64	2	.7656	6	9 7/8	10049
25/32	2	.7812	6	9 7/8	10050
51/64	3	.7969	6 1/8	10 3/4	10051
13/16	3	.8125	6 1/8	10 3/4	10052

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
53/64	3	.8281	6 1/8	10 3/4	10053
27/32	3	.8438	6 1/8	10 3/4	10054
55/64	3	.8594	6 1/8	10 3/4	10055
7/8	3	.8750	6 1/8	10 3/4	10056
57/64	3	.8906	6 1/8	10 3/4	10057
29/32	3	.9062	6 1/8	10 3/4	10058
59/64	3	.9219	6 1/8	10 3/4	10059
15/16	3	.9375	6 1/8	10 3/4	10060
61/64	3	.9531	6 3/8	11	10061
31/32	3	.9688	6 3/8	11	10062
63/64	3	.9844	6 3/8	11	10063
1	3	1.0000	6 3/8	11	10064
1 1/64	3	1.0156	6 1/2	11 1/8	10065
1 1/32	3	1.0312	6 1/2	11 1/8	10066
1 3/64	3	1.0469	6 5/8	11 1/4	10067
1 1/16	3	1.0625	6 5/8	11 1/4	10068
1 5/64	4	1.0781	6 7/8	12 1/2	10069
1 3/32	4	1.0938	6 7/8	12 1/2	10070
1 7/64	4	1.1094	7 1/8	12 3/4	10071
1 1/8	4	1.1250	7 1/8	12 3/4	10072
1 9/64	4	1.1406	7 1/4	12 7/8	10073
1 5/32	4	1.1562	7 1/4	12 7/8	10074
1 11/64	4	1.1719	7 3/8	13	10075
1 3/16	4	1.1875	7 3/8	13	10076
1 13/64	4	1.2031	7 1/2	13 1/8	10077
1 7/32	4	1.2188	7 1/2	13 1/8	10078
1 15/64	4	1.2344	7 7/8	13 1/2	10079
1 1/4	4	1.2500	7 7/8	13 1/2	10080
1 17/64	4	1.2656	8 1/2	14 1/8	10081
1 9/32	4	1.2812	8 1/2	14 1/8	10082
1 19/64	4	1.2969	8 5/8	14 1/4	10083
1 5/16	4	1.3125	8 5/8	14 1/4	10084
1 21/64	4	1.3281	8 3/4	14 3/8	10085
1 11/32	4	1.3438	8 3/4	14 3/8	10086
1 23/64	4	1.3594	8 7/8	14 1/2	10087
1 3/8	4	1.3750	8 7/8	14 1/2	10088
1 25/64	4	1.3906	9	14 5/8	10089
1 13/32	4	1.4062	9	14 5/8	10090
1 27/64	4	1.4219	9 1/8	14 3/4	10091
1 7/16	4	1.4375	9 1/8	14 3/4	10092
1 29/64	4	1.4531	9 1/4	14 7/8	10093
1 15/32	4	1.4688	9 1/4	14 7/8	10094
1 31/64	4	1.4844	9 3/8	15	10095
1 1/2	4	1.5000	9 3/8	15	10096
1 17/32	5	1.5312	9 3/8	16 3/8	10097

(continued)

## Standard Morse Taper Shank Drills — List No. 1302 (continued)

						Foret à queue conique					Broca con zanco cónico						
						MORSE					MORSE						
SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.	SIZE	TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.	SIZE	TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
1 <sup>9</sup> / <sub>16</sub>	5	1.5625	9 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>	10098	2	5	2.0000	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10112	2	5	2.0000	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10112
1 <sup>19</sup> / <sub>32</sub>	5	1.5938	9 <sup>7</sup> / <sub>8</sub>	16 <sup>7</sup> / <sub>8</sub>	10099	2 <sup>1</sup> / <sub>32</sub>	5	2.0312	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10113	2 <sup>1</sup> / <sub>32</sub>	5	2.0312	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10113
1 <sup>5</sup> / <sub>8</sub>	5	1.6250	10	17	10100	2 <sup>1</sup> / <sub>16</sub>	5	2.0625	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10114	2 <sup>1</sup> / <sub>16</sub>	5	2.0625	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10114
1 <sup>21</sup> / <sub>32</sub>	5	1.6562	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10101	2 <sup>1</sup> / <sub>8</sub>	5	2.1250	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10116	2 <sup>1</sup> / <sub>8</sub>	5	2.1250	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10116
1 <sup>11</sup> / <sub>16</sub>	5	1.6875	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10102	2 <sup>5</sup> / <sub>32</sub>	5	2.1562	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10117	2 <sup>5</sup> / <sub>32</sub>	5	2.1562	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10117
1 <sup>23</sup> / <sub>32</sub>	5	1.7188	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10103	2 <sup>3</sup> / <sub>16</sub>	5	2.1875	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10118	2 <sup>3</sup> / <sub>16</sub>	5	2.1875	10 <sup>1</sup> / <sub>4</sub>	17 <sup>3</sup> / <sub>8</sub>	10118
1 <sup>3</sup> / <sub>4</sub>	5	1.7500	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10104	2 <sup>7</sup> / <sub>32</sub>	5	2.2188	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10119	2 <sup>7</sup> / <sub>32</sub>	5	2.2188	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10119
1 <sup>25</sup> / <sub>32</sub>	5	1.7812	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10105	2 <sup>1</sup> / <sub>4</sub>	5	2.2500	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10120	2 <sup>1</sup> / <sub>4</sub>	5	2.2500	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10120
1 <sup>13</sup> / <sub>16</sub>	5	1.8125	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10106	2 <sup>5</sup> / <sub>16</sub>	5	2.3125	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10121	2 <sup>5</sup> / <sub>16</sub>	5	2.3125	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10121
1 <sup>27</sup> / <sub>32</sub>	5	1.8438	10 <sup>1</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	10107	2 <sup>3</sup> / <sub>8</sub>	5	2.3750	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10122	2 <sup>3</sup> / <sub>8</sub>	5	2.3750	10 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10122
1 <sup>7</sup> / <sub>8</sub>	5	1.8750	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10108	2 <sup>7</sup> / <sub>16</sub>	5	2.4375	11 <sup>1</sup> / <sub>4</sub>	18 <sup>3</sup> / <sub>4</sub>	10123	2 <sup>7</sup> / <sub>16</sub>	5	2.4375	11 <sup>1</sup> / <sub>4</sub>	18 <sup>3</sup> / <sub>4</sub>	10123
1 <sup>29</sup> / <sub>32</sub>	5	1.9062	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10109	2 <sup>1</sup> / <sub>2</sub>	5	2.5000	11 <sup>1</sup> / <sub>4</sub>	18 <sup>3</sup> / <sub>4</sub>	10124	2 <sup>1</sup> / <sub>2</sub>	5	2.5000	11 <sup>1</sup> / <sub>4</sub>	18 <sup>3</sup> / <sub>4</sub>	10124
1 <sup>15</sup> / <sub>16</sub>	5	1.9375	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10110	2 <sup>9</sup> / <sub>16</sub>	5	2.5625	11 <sup>7</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>2</sub>	10125	2 <sup>9</sup> / <sub>16</sub>	5	2.5625	11 <sup>7</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>2</sub>	10125
1 <sup>31</sup> / <sub>32</sub>	5	1.9688	10 <sup>3</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>	10111												

## Alternate Morse Taper Shank Drills — List No. 1302

						Foret à queue conique					Broca con zanco cónico						
						MORSE					MORSE						
SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.	SIZE	TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.	SIZE	TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
3 <sup>8</sup> / <sub>16</sub>	2	.3750	3 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>8</sub>	10201*	1 <sup>13</sup> / <sub>64</sub>	3	1.2031	7 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	10243*	1 <sup>13</sup> / <sub>64</sub>	3	1.2031	7 <sup>1</sup> / <sub>2</sub>	12 <sup>1</sup> / <sub>8</sub>	10243*
3 <sup>3</sup> / <sub>64</sub>	1	.5156	4 <sup>5</sup> / <sub>8</sub>	8	10210*	1 <sup>1</sup> / <sub>4</sub>	3	1.2500	7 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	10246	1 <sup>1</sup> / <sub>4</sub>	3	1.2500	7 <sup>7</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	10246
9 <sup>1</sup> / <sub>16</sub>	1	.5625	4 <sup>7</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>4</sub>	10213*	1 <sup>37</sup> / <sub>64</sub>	4	1.5781	9 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	10251*	1 <sup>37</sup> / <sub>64</sub>	4	1.5781	9 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	10251*
4 <sup>1</sup> / <sub>64</sub>	3	.6406	5 <sup>1</sup> / <sub>8</sub>	9 <sup>3</sup> / <sub>4</sub>	10214*	1 <sup>19</sup> / <sub>32</sub>	4	1.5938	9 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	10252*	1 <sup>19</sup> / <sub>32</sub>	4	1.5938	9 <sup>7</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>2</sub>	10252*
4 <sup>5</sup> / <sub>64</sub>	3	.7031	5 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	10218*	1 <sup>41</sup> / <sub>64</sub>	4	1.6406	10 <sup>1</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	10255*	1 <sup>41</sup> / <sub>64</sub>	4	1.6406	10 <sup>1</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	10255*
2 <sup>7</sup> / <sub>32</sub>	2	.8438	6 <sup>1</sup> / <sub>8</sub>	10	10227*	1 <sup>31</sup> / <sub>32</sub>	4	1.9688	10 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>	10269*	1 <sup>31</sup> / <sub>32</sub>	4	1.9688	10 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>	10269*
7 <sup>8</sup> / <sub>16</sub>	2	.8750	6 <sup>1</sup> / <sub>8</sub>	10	10229	2	4	2.0000	10 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>	10270	2	4	2.0000	10 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>	10270
1 <sup>3</sup> / <sub>32</sub>	3	1.0938	6 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>2</sub>	10236*												

\*Available While Supplies Last

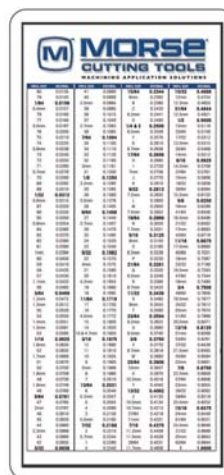
## Decimal Equivalent Pocket Chart List No. 1005

Tableau décimal      Tabla de medidas decimales

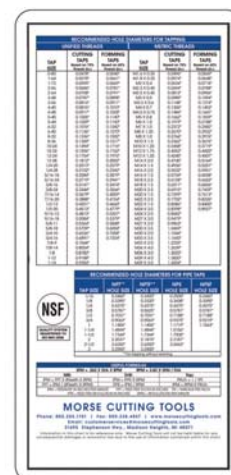
NEW LOOK! LARGER SIZE! Decimal Equivalents.  
Tap Drill Sizes for inch, metric and pipe threads.  
Size: 3<sup>3</sup>/<sub>8</sub>" x 7", Printed on plastic

Pack of 50  
EDP No. 20412

Pack of 100  
EDP No. 20413



Front



Back

# Carbide Tipped Masonry Drills

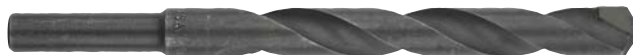
For drilling in brick, stone, concrete, slate, plaster and other masonry materials.

**Regular Helix** features wide flutes for fast dust removal especially in softer materials.

**High Helix** provides exceptional strength to minimize chipping of the carbide tip. Recommended for drilling in hard concrete aggregates and hard masonry products.

Foret de maçonnerie

Broca de mamposteria



List No. 5463 Regular Helix



List No. 5464 High Helix

STANDARD PACKAGE All sizes — 1 each

SIZE	DEC. EQUIV.	OAL	SHANK DIA.	5463 EDP NO.	5464 EDP NO.
1/8	.1250	3	1/8	53401	53451
3/16	.1875	3	3/16	53402	53452
1/4	.2500	4	1/4	53403	53453
1/4	.2500	6	1/4	53404	53454
5/16	.3125	4	1/4	53405	53455
5/16	.3125	6	1/4	53406	53456
3/8	.3750	4	1/4	53407	53457
3/8	.3750	6	1/4	53408	53458
7/16	.4375	4	1/4	—	53459
7/16	.4375	6	1/4	—	53460
1/2	.5000	4	1/4	—	53462
1/2	.5000	6	1/4	53410	53463
1/2	.5000	6	3/8	53411	53464
9/16	.5625	6	3/8	53412	53465
5/8	.6250	6	1/2	53413	53466
1 1/16	.6875	6	1/2	53414	53467
3/4	.7500	6	1/2	53415	53468
7/8	.8750	6	1/2	53416	53469
1	1.000	6	1/2	53417	53470

# Carbide Tipped Extra Length Masonry Drills

Foret de maçonnerie

Broca de mamposteria



List No. 5466 High Helix

STANDARD PACKAGE All sizes — 1 each

SIZE	DEC. EQUIV.	SHANK DIA.	OVERALL LENGTH 13"	OVERALL LENGTH 18"
			FLUTE LENGTH 8" EDP NO.	FLUTE LENGTH 14" EDP NO.
1/4	.2500	1/4	53501*	—
5/16	.3125	1/4	53502*	—
7/16	.4375	1/4	53504*	—
9/16	.5625	3/8	—	53526*
5/8	.6250	1/2	—	53527*
1 1/16	.6875	1/2	—	53528*
3/4	.7500	1/2	53509*	53529*
7/8	.8750	1/2	53510*	53530*
1	1.0000	1/2	53511*	53531*

\* Available While Supplies Last

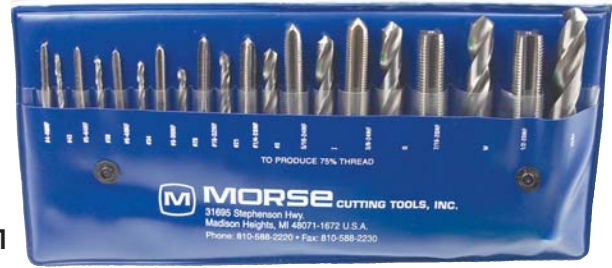
# Tap and Drill Kits

3 Series Available • NC, NF, Metric

Ensemble de tarauds et de forets    Juegos de machuelos y brocas

**ALL KITS INCLUDE**

- 10 popular sized high speed steel hand taps.
- 10 popular sized high speed steel screw machine length drills.
- 128 page Machinist's Guide for Taps.
- Packaged in a durable plastic pouch.



List No. 8001

EDP NO. 37103		EDP NO. 37104		EDP NO. 37105	
SET NO. 103 – NC TAPS		SET NO. 104 – NF TAPS		SET NO. 105 – METRIC TAPS	
NC TAPS	DRILLS	NF TAPS	DRILLS	METRIC TAPS	DRILLS
#4-40	#44	#4-48	#43	M3 x 0.5	#40
#5-40	#39	#5-44	#38	M3.5 x 0.6	#33
#6-32	#36	#6-40	#34	M4 x 0.7	#30
#8-32	#30	#8-36	#29	M4.5 x 0.75	#26
#10-24	#25	#10-32	#21	M5 x 0.8	#19
1/4-20	#7	1/4-28	#3	M6 x 1	#9
5/16-18	F	5/16-24	I	M7 x 1	19/64
3/8-16	5/16	3/8-24	Q	M8 x 1.25	17/64
7/16-14	U	7/16-20	W	M10 x 1.5	Q
1/2-13	27/64	1/2-20	29/64	M12 x 1.75	Y

Jeu de forets

Juego de brocas

## 33-Pc. 1/2" Shank S & D Drill Sets

In metal indexed stand



List No. 8040

**Ambore™** – Gold & Black Finish  
3-Flat Shank  
118° Self-Centering Split Point  
High Speed Steel

(List No. 1424S)

## 8-Pc. 1/2" Shank S & D Drill Sets

In metal indexed case



List No. 8040

**Ambore™** – Gold & Black Finish  
3-Flat Shank  
118° Self-Centering Split Point  
High Speed Steel

(List No. 1424S)

List No. 8040R  
Round Shanks  
118° Point  
High Speed Steel

(List No. 1424R)

SET NO.	PIECES PER SET	SIZE RANGE	8040 EDP NO.	8040R EDP NO.
33F	33	1/2" to 1" by 64ths	18111	—
33R			—	18112

List No. 8040R  
Round Shanks  
118° Point  
High Speed Steel

(List No. 1424R)

SET NO.	PIECES PER SET	SIZE RANGE	8040 EDP NO.	8040R EDP NO.
20HD	8	9/16-5/8-11/16-3/4	18110	—
20HR			—	18109

# Morse Drill Sets

Jeu de forets

Juego de brocas

## Jobber Length

High Speed Steel — 118° Point  
General Purpose

SET NO.	PIECES PER SET	SIZE RANGE	BRIGHT EDP NO.	TREATED EDP NO.
2HD	21	1/16 to 3/8 by 64ths	18143	18100
5HD	29	1/16 to 1/2 by 64ths	18144	18101
6HD	15	1/16 to 1/2 by 32nds	18145	18102
8HD	60	Nos. 1 to 60	18146	18103
15HD	26	A to Z	18147	18104
22HD	13	1/16 to 1/4 by 64ths	18148	18105
24HD	20	Nos. 61 to 80	—	18106
26HD	25	1.0mm to 13.0mm by .5mms	—	18107
28HD	13	1.0mm to 7.0mm by .5mms	—	18108



List No. 8030  
In Plastic Indexed Case

## TiN Coated

## Jobber Length

High Speed Steel — 118° Point  
General Purpose

SET NO.	PIECES PER SET	SIZE RANGE	TIN COAT EDP NO.
5HG	29	1/16 to 1/2 by 64ths	18183



List No. 8030  
In Plastic Indexed Case

## Left Hand

## Jobber Length

High Speed Steel — 118° Point  
General Purpose

Bright Finish

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5LD	29	1/16 to 1/2 by 64ths	18005



List No. 8020  
In Plastic Indexed Case

## 3-in-1 Combination

## Jobber Length

High Speed Steel — 118° Point

SET NO.	PCS. PER SET	SIZE RANGE	BRIGHT EDP NO.	TREATED EDP NO.
69HD	115	1/16 to 1/2 by 64ths A-Z and Nos. 1-60	18004	18003



List No. 8000  
In Metal Indexed Case



# Morse Drill Sets

Jeu de forets

Juego de brocas

## 3/8" Reduced Shank Jobber Length

High Speed Steel - 118° Point  
Black Oxide Treated

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5HT	29	1/16 to 1/2 by 64ths	18400
6HT	15	1/16 to 1/2 by 32nds	18401

List No. 8035  
In Plastic Indexed Case



## Heavy Duty Jobber Length

High Speed Steel — 135° Split Point  
Black Oxide Treated — NAS 907, Type B

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5HS	29	1/16 to 1/2 by 64ths	18172
8HS	60	Nos. 1 to 60	18174

List No. 8080  
In Plastic Indexed Case



## Ambore™ Heavy Duty Jobber Length

High Speed Steel — 135° Split Point  
Gold and Black Finish

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5GS	29	1/16 to 1/2 by 64ths	18182

List No. 8080  
In Plastic Indexed Case



## Cobalt Heavy Duty Jobber Length

135° Split Point — NAS 907, Type J

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5CD	29	1/16 to 1/2 by 64ths	18166
6CD	15	1/16 to 1/2 by 32nds	18167
8CD	60	Nos. 1 to 60	18168
15CD	26	A to Z	18169

List No. 8070  
In Plastic Indexed Case



# Morse Drill Sets

Jeu de forets

Juego de brocas

## Taper Length

High Speed Steel — 118° Point  
 Black Oxide Treated  
 General Purpose  
 Straight Shank

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5TL	29	1/16 to 1/2 by 64ths	18184



List No. 8095— In Metal Indexed Case

## Screw Machine Length

High Speed Steel — Bright Finish  
 118° Point

SET NO.	PIECES PER SET	SIZE RANGE	EDP NO.
5SM	29	1/16 to 1/2 by 64ths	18177
6SM	15	1/16 to 1/2 by 32nds	18178
22SM	13	1/16 to 1/4 by 64ths	18181



List No. 8090 — In Metal Indexed Case

## Drill Counter Display

Présentoir de forets

Exhibidor de brocas

## Drill Counter Display

- All steel welded outer shell with a clear, hinged polycarbonate front for high visibility and shatterproof durability.
- Lockable with own set of two keys.
- Steel drill gauge on top assures correct sizing of drills.
- All compartments display drills vertically to use less counter space and are rounded to make small drills readily accessible.
- Compact, takes less counterspace.
- 12-3/4"W x 14"D x 14-1/4"H. Weight: 14 lbs.

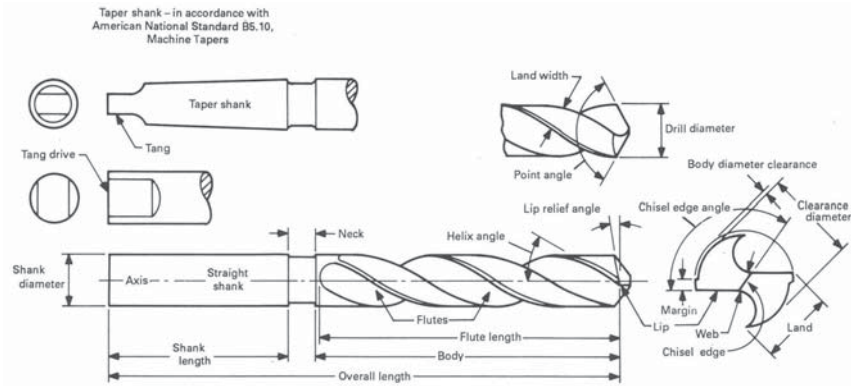


List No. 9020

Drills not included.  
 For fractional drills 1/16" to 1/2" by 64ths.

CAPACITY	SIZE RANGE	EDP NO.
29 SIZES	1/16 to 1/2 by 64ths	08211

# Drill Terminology



**Twist Drill** — A rotary end cutting tool having one or more cutting lips, and having one or more helical or straight flutes for the passage of chips and the admission of a cutting fluid.

**Axis** — The imaginary straight line which forms the longitudinal center line of the drill.

**Back Taper** — A slight decrease in diameter from front to back in the body of the drill.

**Body** — The portion of the drill extending from the shank or neck to the outer corners of the cutting lips.

**Body Diameter Clearance** — That portion of the land that has been cut away so it will not rub against the walls of the hole.

**Chip Packing** — The failure of chips to pass through the flute during the cutting action, generally resulting in tool failure.

**Chipping** — The breakdown at a cutting lip or margin by loss of fragments broken away during the cutting action.

**Chisel Edge** — The edge at the end of the web that connects the cutting lips.

**Chisel Edge Angle** — The angle included between the chisel edge and the cutting lip, as viewed from the end of the drill.

**Clearance** — The space provided to eliminate undesirable contact between the drill and the work piece.

**Clearance Diameter** — The diameter over the cut away portion of the drill lands.

**Drill Diameter** — The diameter over the margins of the drill measured at the point.

**Flutes** — Helical or straight grooves cut or formed in the body of the drill to provide cutting lips, to permit removal of chips, and to allow cutting fluid to reach the cutting lips.

**Flute Length** — The length from the outer corners of the cutting lips to the extreme back end of the flutes. It includes the sweep of the tool used to generate the flutes and, therefore, does not indicate the usable length of flutes.

**Heel** — The trailing edge of the land.

**Helical Flutes** — Flutes which are formed in a helical path around the axis.

**Helix Angle** — The angle made by the leading edge of the land with a plane containing the axis of the drill.

**Land** — The peripheral portion of the body between adjacent flutes.

**Land Clearance** — See preferred term Body Diameter Clearance.

**Land Width** — The distance between the leading edge and the heel of the land measured at a right angle to the leading edge.

**Length of Twist** — See preferred term Flute Length

**Lips** — The cutting edges of a two flute drill extending from the chisel edge to the periphery. (Core Drills) — The cutting edges extending from the bottom of the chamfer to the periphery.

**Lip Relief** — The axial relief angle at the outer corner of the lip. It is measured by projection into a plane tangent to the periphery at the outer corner of the lip.

**Margin** — The cylindrical portion of the land which is not cut away to provide clearance.

**Neck** — The section of reduced diameter between the body and the shank of the drill.

**Overall Length** — The length from the extreme end of the shank to the outer corners of the cutting lips. It does not include the conical shank end often used on straight shank drills, nor does it include the conical cutting point used on both straight and taper shank drills. (Core Drills) — For drills with an external center on the cutting end, same as for two flute drills. For those with internal centers on the cutting end, the overall length is from the extreme ends of the tool.

**Point** — The cutting end of a drill, made up of the ends of the lands and the web, in form it resembles a cone, but departs from a true cone to furnish clearance behind the cutting lips.

**Point Angle** — The angle included between the cutting lips projected upon a plane parallel to the drill axis and parallel to the two cutting lips.

**Relief** — The result of the removal of tool material behind or adjacent to the cutting lip and leading edge of the land to provide clearance and prevent rubbing (heel drag).

**Shank** — The part of the drill by which it is held and driven.

**Straight Flutes** — Flutes which form lands lying in an axial plane.

**Straight Shank Drills** — Those having cylindrical shanks which may be the same or different diameter than the body of the drill. The shank may be made with or without driving flats, tang, grooves or thread.

**Tang** — The flattened end of a taper shank, intended to fit into a driving slot in a socket.

**Tang Drive** — Two opposite parallel driving flats on the extreme end of a straight shank.

**Taper Shank Drills** — Those having conical shanks suitable for direct fitting into tapered holes in machine spindles, driving sleeves or sockets. Tapered shanks generally have a tang.

**Web** — The central portion of the body that joins the lands. The extreme end of the web forms the chisel edge on a two-flute drill.

**Web Thickness** — The thickness of the web at the point, unless another specific location is indicated.

# High Speed Steel & Cobalt Drills

## Speed and Feed Recommendations

WORKPIECE MATERIAL	BRINELL HARDNESS BHN	SURFACE SPEED SFM	FEED PER REVOLUTION BY DRILL DIAMETER				
			1/8"	1/4"	1/2"	3/4"	1"
<b>Low Carbon Steel</b> 1018, 12L12, 1108, 1213	≤120	110	0.0030	0.0040	0.0080	0.0100	0.0110
<b>Low &amp; Medium Carbon Steel</b> 1018, 1551, 11L44	120 - 250	65	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Medium Carbon and Alloyed Steel</b> 1040, 1140, 4340, 8640	≤250	60	0.0030	0.0040	0.0080	0.0100	0.0110
<b>Tool and Die Steels</b> P20, A2, D2, H12	≤250	50	0.0030	0.0040	0.0080	0.0100	0.0110
<b>Tool and Die Steels</b> P20, A2, D2, H12	250 - 350	35	0.0020	0.0030	0.0060	0.0070	0.0080
<b>Free Machining Stainless Steels</b> 303, 410, 416, 440F	≤250	60	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Moderate Machining Stainless Steels</b> 304, 316	≤300	45	0.0020	0.0030	0.0060	0.0070	0.0080
<b>Difficult Machining Stainless Steels</b> 17-4PH, 316L, AM350	≤300	20	0.0020	0.0030	0.0060	0.0070	0.0080
<b>Cast Iron</b> Soft Gray	≤160	105	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Cast Iron</b> Gray	160 - 260	90	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Cast Iron</b> Ductile	250	80	0.0030	0.0040	0.0080	0.0100	0.0110
<b>Cast Iron</b> Malleable	250 - 330	55	0.0020	0.0030	0.0060	0.0070	0.0080
<b>Titanium Alloys</b> Commercially Pure 99.0	110 - 170	90	0.0030	0.0040	0.0080	0.0100	0.0110
<b>Titanium Alloys</b> Ti-6Al-4V, ASTM B367 Grades C-3, C-4	≤250	50	0.0030	0.0040	0.0080	0.0100	0.0110
<b>High Temperature Alloys</b> Inconel, Hastelloy, Waspaloy	≤150	50	0.0030	0.0040	0.0080	0.0100	0.0110
<b>High Temperature Alloys</b> Inconel, Hastelloy, Waspaloy	150 - 250	20	0.0010	0.0020	0.0045	0.0060	0.0070
<b>Aluminum Alloys</b> 2025, 6061, A140, 514.0	≤150	325	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Copper Alloys</b> Brass and Bronze	≤200	80	0.0040	0.0060	0.0110	0.0130	0.0140
<b>Composites &amp; Plastics</b>	≤128	175	0.0020	0.0030	0.0060	0.0070	0.0080
<b>Magnesium Alloys</b> AZ80A, HM12A, AM60A, ZE41A	50 - 90	325	0.0040	0.0060	0.0110	0.0130	0.0140

**NOTE:** The speeds and feeds shown are suggested starting points only and may be increased or decreased depending on actual material and machining conditions. Start conservatively and increase speed and feed until drilling cycle is optimized.

Tool Coatings Also Available

# Solid Carbide Drills

## Speed and Feed Recommendations

List No. 5374 Standard Length GP • List No. 5375 Screw Machine Length • List No. 5376 Straight Flute

Workpiece Material	Brinell Hardness (BHN)	Morse List No.	Surface Speed (SFM)	FEED PER REVOLUTION BY DRILL DIAMETER (IPR)			
				1/16"	1/8"	1/4"	1/2"
Low Carbon Steel 1018, 12L12, 1108, 1213	≤ 120	5374	250	0.0015	0.0030	0.0040	0.0080
		5375					
		5376					
Low & Medium Carbon Steel 1018, 1551, 11L44	120 - 250	5374	225	0.0020	0.0040	0.0060	0.0110
		5375					
		5376					
Medium Carbon and Alloyed Steel 1040, 1140, 4340, 8640	≤ 250	5374	200	0.0015	0.0030	0.0040	0.0080
		5375	150	0.0015	0.0030	0.0040	0.0080
		5376					
Tool and Die Steels P20, A2, D2, H12	≤ 250	5374	200	0.0015	0.0030	0.0040	0.0080
		5375					
		5376					
Tool and Die Steels P20, A2, D2, H12	250 - 350	5374	150	0.0010	0.0020	0.0030	0.0060
		5375	125	0.0010	0.0020	0.0030	0.0060
		5376	125	0.0010	0.0020	0.0030	0.0060
Hard Materials, Alloys, Tool Steels 40 Rockwell C and Higher	—	5374					
		5375					
		5376	60	0.0005	0.0010	0.0015	0.0020
Free Machining Stainless Steels 303,410, 416, 440F	≤ 260	5374	100	0.0010	0.0020	0.0030	0.0060
		5375	100	0.0010	0.0020	0.0030	0.0060
		5376					
Moderate Machining Stainless Steels 304, 316	≤ 300	5374					
		5375	75	0.0010	0.0020	0.0030	0.0060
		5376	75	0.0010	0.0020	0.0030	0.0060
Difficult Machining Stainless Steels 17-4PH, 316L, AM350	≤ 450	5374					
		5375	60	0.0010	0.0020	0.0030	0.0060
		5376	60	0.0010	0.0020	0.0030	0.0060
Cast Iron - Soft Gray	≤ 160	5374	250	0.0015	0.0030	0.0040	0.0080
		5375	275	0.0020	0.0040	0.0060	0.0110
		5376	275	0.0015	0.0030	0.0040	0.0080
Cast Iron - Gray	160 - 260	5374	250	0.0015	0.0030	0.0040	0.0080
		5375	275	0.0020	0.0040	0.0060	0.0110
		5376	250	0.0015	0.0030	0.0040	0.0080
Cast Iron - Ductile	250	5374	180	0.0015	0.0030	0.0040	0.0080
		5375	180	0.0020	0.0040	0.0060	0.0110
		5376	175	0.0015	0.0030	0.0040	0.0080
Cast Iron - Malleable	250 - 330	5374	180	0.0015	0.0030	0.0040	0.0080
		5375	180	0.0020	0.0040	0.0060	0.0110
		5376	180	0.0015	0.0030	0.0040	0.0080
Titanium Alloys Commercially Pure 99.0	110 - 170	5374					
		5375	50	0.0005	0.0010	0.0020	0.0045
		5376	50	0.0005	0.0010	0.0020	0.0045
Titanium Alloys Ti-6Al-4V, ASTM B367 Grades C-3, C-4	≤ 250	5374					
		5375	50	0.0005	0.0010	0.0020	0.0045
		5376	50	0.0005	0.0010	0.0020	0.0045
High Temperature Alloys Inconel, Hastelloy, Waspaloy	150 - 250	5374					
		5375	60	0.0005	0.0010	0.0020	0.0045
		5376	60	0.0005	0.0010	0.0020	0.0045
Aluminum Alloys 2025, 6061, A140, 514.0	≤ 150	5374	350	0.0020	0.0040	0.0060	0.0110
		5375					
		5376					
Copper Alloys Brass and Bronze	≤ 200	5374	80	0.0020	0.0040	0.0060	0.0110
		5375					
		5376					
Composites & Plastics	≤ 128	5374	175	0.0010	0.0020	0.0030	0.0060
		5375					
		5376					
Magnesium Alloys AZ80A, HM12A, AM60A, ZE41A	50 - 90	5374	325	0.0020	0.0040	0.0060	0.0110
		5375					
		5376					

SPEEDS and FEEDS are suggested starting points only and may be increased or decreased depending on actual material and machining conditions. Start conservatively and increase speed and feed until drilling cycle is optimized.

# REAMERS

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### TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Straight Shank Chucking Reamers

High Speed Steel  
Straight Flute — Right Hand Cut

45° Chamfer for reaming of most materials

Alésoir machine

Rima de máquina



List No. 1655

Diameter Tolerances

up to 1/2" — +.0002/-0

over 1/2" to 5/8" — +.0003/-0

over 5/8" to 1 1/2" — +.0001/+0.0004

Decimal Sizes: Pages 90-93  
Dowel Pin Sizes: Page 94  
Metric Sizes: Pages 88-89

**STANDARD** All sizes - 1 each  
**PACKAGE**

FRAC-TIONAL	SIZE WIRE GAGE AND DECIMAL	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
	#60	.0400	.0390	1/2	2 1/2	4	22101
	59	.0410	.0390	1/2	2 1/2	4	22102
	58	.0420	.0390	1/2	2 1/2	4	22103
	57	.0430	.0390	1/2	2 1/2	4	22104
	56	.0465	.0455	1/2	2 1/2	4	22105
3/64		.0469	.0455	1/2	2 1/2	4	22106
	55	.0520	.0510	1/2	2 1/2	4	22107
	54	.0550	.0510	1/2	2 1/2	4	22108
	53	.0595	.0585	1/2	2 1/2	4	22109
1/16		.0625	.0585	1/2	2 1/2	4	22110
	52	.0635	.0585	1/2	2 1/2	4	22111
	51	.0670	.0660	3/4	3	4	22112
	50	.0700	.0660	3/4	3	4	22113
	49	.0730	.0660	3/4	3	4	22114
	48	.0760	.0720	3/4	3	4	22115
5/64		.0781	.0720	3/4	3	4	22116
	47	.0785	.0720	3/4	3	4	22117
	46	.0810	.0771	3/4	3	4	22118
	45	.0820	.0771	3/4	3	4	22119
	44	.0860	.0810	3/4	3	4	22120
	43	.0890	.0810	3/4	3	4	22121
	42	.0935	.0880	3/4	3	4	22122
3/32		.0938	.0880	3/4	3	4	22123
	41	.0960	.0928	7/8	3 1/2	4	22124
	40	.0980	.0928	7/8	3 1/2	4	22125
	39	.0995	.0928	7/8	3 1/2	4	22126
	38	.1015	.0950	7/8	3 1/2	4	22127
	37	.1040	.0950	7/8	3 1/2	4	22128
	36	.1065	.1030	7/8	3 1/2	4	22129
7/64		.1094	.1030	7/8	3 1/2	4	22130
	35	.1100	.1030	7/8	3 1/2	4	22131
	34	.1110	.1055	7/8	3 1/2	4	22132
	33	.1130	.1055	7/8	3 1/2	4	22133
	32	.1160	.1120	7/8	3 1/2	4	22134
	31	.1200	.1120	7/8	3 1/2	4	22135
	.1240	.1240	.1190	7/8	3 1/2	4	22136
1/8		.1250	.1190	7/8	3 1/2	4	22137
	.1260	.1260	.1190	7/8	3 1/2	4	22138
	30	.1285	.1190	7/8	3 1/2	4	22139
	29	.1360	.1275	1	4	4	22140
	28	.1405	.1350	1	4	4	22141
9/64		.1406	.1350	1	4	4	22142
	27	.1440	.1350	1	4	4	22143
	26	.1470	.1430	1	4	4	22144
	25	.1495	.1430	1	4	4	22145
	24	.1520	.1460	1	4	4	22146
	23	.1540	.1460	1	4	4	22147
5/32		.1562	.1510	1	4	6	22148
	22	.1570	.1510	1	4	6	22149

(continued)

# Straight Shank Chucking Reamers (continued)

List No. 1655

Alésoir machine

Rima de máquina

FRAC- TIONAL	SIZE		WIRE GAGE AND DECIMAL	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
	LETTER								
1 <sup>1</sup> / <sub>64</sub>		#21	.1590	.1530	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22150	
		20	.1610	.1530	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22151	
		19	.1660	.1595	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22152	
		18	.1695	.1595	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22153	
			.1719	.1645	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22154	
		17	.1730	.1645	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22155	
		16	.1770	.1704	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22156	
		15	.1800	.1755	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22157	
3 <sup>1</sup> / <sub>16</sub>			.1820	.1755	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22158	
			.1850	.1805	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22159	
			.1865	.1865	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22160	
			.1875	.1805	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22161	
			.1885	.1805	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22162	
		12	.1890	.1805	1 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	6	22163	
1 <sup>3</sup> / <sub>64</sub>		11	.1910	.1860	1 <sup>1</sup> / <sub>4</sub>	5	6	22164	
		10	.1935	.1895	1 <sup>1</sup> / <sub>4</sub>	5	6	22165	
		9	.1960	.1895	1 <sup>1</sup> / <sub>4</sub>	5	6	22166	
		8	.1990	.1895	1 <sup>1</sup> / <sub>4</sub>	5	6	22167	
		7	.2010	.1895	1 <sup>1</sup> / <sub>4</sub>	5	6	22168	
			.2031	.1945	1 <sup>1</sup> / <sub>4</sub>	5	6	22169	
		6	.2040	.1945	1 <sup>1</sup> / <sub>4</sub>	5	6	22170	
		5	.2055	.2016	1 <sup>1</sup> / <sub>4</sub>	5	6	22171	
7 <sup>1</sup> / <sub>32</sub>		4	.2090	.2016	1 <sup>1</sup> / <sub>4</sub>	5	6	22172	
		3	.2130	.2075	1 <sup>1</sup> / <sub>4</sub>	5	6	22173	
			.2187	.2075	1 <sup>1</sup> / <sub>4</sub>	5	6	22174	
		2	.2210	.2173	1 <sup>1</sup> / <sub>2</sub>	6	6	22175	
		1	.2280	.2173	1 <sup>1</sup> / <sub>2</sub>	6	6	22176	
1 <sup>5</sup> / <sub>64</sub>	A		.2340	.2265	1 <sup>1</sup> / <sub>2</sub>	6	6	22177	
			.2344	.2265	1 <sup>1</sup> / <sub>2</sub>	6	6	22178	
	B		.2380	.2329	1 <sup>1</sup> / <sub>2</sub>	6	6	22179	
			.2420	.2329	1 <sup>1</sup> / <sub>2</sub>	6	6	22180	
1 <sup>1</sup> / <sub>4</sub>	D		.2460	.2329	1 <sup>1</sup> / <sub>2</sub>	6	6	22181	
		.2490	.2490	.2405	1 <sup>1</sup> / <sub>2</sub>	6	6	22182	
	E		.2500	.2405	1 <sup>1</sup> / <sub>2</sub>	6	6	22183	
		.2510	.2510	.2405	1 <sup>1</sup> / <sub>2</sub>	6	6	22185	
		F		.2570	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22186
1 <sup>7</sup> / <sub>64</sub>	G		.2610	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22187	
			.2656	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22188	
	H		.2660	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22189	
	I		.2720	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22190	
		J		.2770	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22191
9 <sup>1</sup> / <sub>32</sub>	K		.2810	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22192	
			.2812	.2485	1 <sup>1</sup> / <sub>2</sub>	6	6	22193	
	L		.2900	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22194	
	M		.2950	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22195	
			.2969	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22196	
1 <sup>9</sup> / <sub>64</sub>	N		.3020	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22197	
		.3115	.3115	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22198	
			.3125	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22199	
		.3135	.3135	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22200	
2 <sup>1</sup> / <sub>64</sub>	O		.3160	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22201	
	P		.3230	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22202	
			.3281	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22203	
	Q		.3320	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22204	
	R		.3390	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22205	
			.3437	.2792	1 <sup>1</sup> / <sub>2</sub>	6	6	22206	
1 <sup>1</sup> / <sub>32</sub>	S		.3480	.3105	1 <sup>3</sup> / <sub>4</sub>	7	6	22207	
	T		.3580	.3105	1 <sup>3</sup> / <sub>4</sub>	7	6	22208	
			.3594	.3105	1 <sup>3</sup> / <sub>4</sub>	7	6	22209	

(continued)



# Straight Shank Chucking Reamers (continued)

List No. 1655

Alésoir machine

Rima de máquina

Decimal Sizes: Pages 90-93  
Dowel Pin Sizes: Page 94  
Metric Sizes: Pages 88-89

Reamers

FRAC-TIONAL	SIZE		DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
	LETTER	DECIMAL						
3/8	U	.3740	.3680	.3105	1 3/4	7	6	22210
			.3740	.3105	1 3/4	7	6	22211
	V	.3750	.3750	.3105	1 3/4	7	6	22212
		.3760	.3760	.3105	1 3/4	7	6	22213
25/64	W	.3770	.3770	.3105	1 3/4	7	6	22214
			.3860	.3105	1 3/4	7	6	22215
	X	.3906	.3906	.3105	1 3/4	7	6	22216
		.3970	.3970	.3105	1 3/4	7	6	22217
13/32	Y	.4040	.4040	.3105	1 3/4	7	6	22218
		.4062	.4062	.3105	1 3/4	7	6	22219
	Z	.4130	.4130	.3730	1 3/4	7	6	22220
		.4219	.4219	.3730	1 3/4	7	6	22221
7/16		.4365	.4365	.3730	1 3/4	7	6	22222
		.4375	.4375	.3730	1 3/4	7	6	22223
		.4385	.4385	.3730	1 3/4	7	6	22224
		.4531	.4531	.3730	1 3/4	7	6	22225
29/64	19/32	.4688	.4688	.3730	1 3/4	7	6	22226
		.4844	.4844	.4355	2	8	6	22227
	31/64	.4990	.4990	.4355	2	8	6	22228
		.5000	.5000	.4355	2	8	6	22229
1/2		.5010	.5010	.4355	2	8	6	22230
		.5312	.5312	.4355	2	8	6	22231
	9/16	.5625	.5625	.4355	2	8	8	22232
		.5937	.5937	.4355	2	8	8	22233
5/8	21/32	.6250	.6250	.5615	2 1/4	9	8	22234
		.6562	.6562	.5615	2 1/4	9	8	22235
	11/16	.6875	.6875	.5615	2 1/4	9	8	22236
		.7187	.7187	.5615	2 1/4	9	8	22237
3/4	23/32	.7500	.7500	.6240	2 1/2	9 1/2	8	22238
		.7812	.7812	.6240	2 1/2	9 1/2	8	22239
	13/16	.8125	.8125	.6240	2 1/2	9 1/2	8	22240
		.8437	.8437	.6240	2 1/2	9 1/2	8	22241
7/8	29/32	.8750	.8750	.7490	2 5/8	10	8	22242
		.9062	.9062	.7490	2 5/8	10	8	22243
	15/16	.9375	.9375	.7490	2 5/8	10	8	22244
		.9687	.9687	.7490	2 5/8	10	8	22245
1	31/32	1.0000	1.0000	.8740	2 3/4	10 1/2	8	22246
		1.0625	1.0625	.8740	2 3/4	10 1/2	8	22247
	1 1/16	1.1250	1.1250	.8740	2 7/8	11	10	22248
		1.1875	1.1875	.9990	2 7/8	11	10	22249
1 1/4		1.2500	1.2500	.9990	3	11 1/2	10	22250
		1.3750	1.3750	.9990	3 1/4	12	10	22251
		1.5000	1.5000	1.2490	3 1/2	12 1/2	10	22252

## Straight Shank Chucking Reamer Sets

High Speed Steel — Straight Flute  
Right Hand Cut

SET NO.	PCS. PER SET	SIZE RANGE	EDP NO.
501	29	1/16 to 1/2 by 64ths	22301
502	26	A to Z	22302
503	60	Nos. 1 to 60	22303

Jeu d'alésoirs

Juego de rimas



List No. 1655  
In Metal Indexed Case

# Metric Straight Shank Chuckling Reamers

High Speed Steel  
Straight Flute — Right Hand Cut

45° Chamfer for reaming of most materials.

MM SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1.0	.0394	.0394	½	2½	4	22350
1.5	.0591	.0510	½	2½	4	22351
2.0	.0787	.0720	¾	3	4	22352
2.5	.0984	.0928	¾	3½	4	22353
3.0	.1181	.1120	¾	3½	4	22354
3.5	.1378	.1350	1	4	4	22355
4.0	.1575	.1510	1	4	6	22356
4.5	.1772	.1704	1⅛	4½	6	22357
5.0	.1969	.1895	1¼	5	6	22358
5.5	.2165	.2075	1¼	5	6	22359
6.0	.2362	.2265	1½	6	6	22360
6.5	.2559	.2405	1½	6	6	22361
7.0	.2756	.2485	1½	6	6	22362
7.5	.2953	.2792	1½	6	6	22363
8.0	.3150	.2792	1½	6	6	22364
8.5	.3346	.2792	1½	6	6	22365
9.0	.3543	.3105	1¾	7	6	22366
9.5	.3740	.3105	1¾	7	6	22367
10.0	.3937	.3105	1¾	7	6	22368
10.5	.4134	.3730	1¾	7	6	22369
11.0	.4331	.3730	1¾	7	6	22370
11.5	.4528	.3730	1¾	7	6	22371
12.0	.4724	.4355	2	8	6	22372
12.5	.4921	.4355	2	8	6	22373
13.0	.5118	.4355	2	8	6	22374
13.5	.5315	.4355	2	8	6	22375

Alésoir machine

Rima de máquina



List No. 1655M

Diameter Tolerances (Inches)

up to 12.5 mm — +.0002/-0

13.0 mm to 15.5 mm — +.0003/-0

16.0 mm to 25.0 mm — +.0001/+0.0004

STANDARD All sizes — 1 each  
PACKAGE

MM SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
14.0	.5512	.4355	2	8	8	22376
14.5	.5709	.4355	2	8	8	22377
15.0	.5906	.4355	2	8	8	22378
15.5	.6102	.5615	2¼	9	8	22379
16.0	.6299	.5615	2¼	9	8	22380
16.5	.6496	.5615	2¼	9	8	22381
17.0	.6693	.5615	2¼	9	8	22382
17.5	.6890	.5615	2¼	9	8	22383
18.0	.7087	.5615	2¼	9	8	22384
18.5	.7283	.6240	2½	9	8	22385
19.0	.7480	.6240	2½	9	8	22386
19.5	.7677	.6240	2½	9	8	22387
20.0	.7874	.6240	2½	9	8	22388
20.5	.8071	.6240	2½	9	8	22389
21.0	.8268	.6240	2½	9½	8	22390
21.5	.8465	.7490	2⅝	10	8	22391
22.0	.8661	.7490	2⅝	10	8	22392
22.5	.8858	.7490	2⅝	10	8	22393
23.0	.9055	.7490	2⅝	10	8	22394
23.5	.9252	.7490	2⅝	10	8	22395
24.0	.9449	.7490	2⅝	10	8	22396
24.5	.9646	.7490	2⅝	10	8	22397
25.0	.9843	.8740	2¾	10½	8	22398

## Metric Straight Shank Chuckling Reamer Sets

High Speed Steel Straight Flute – Right Hand Cut

Jeu d'alésoirs

Juego de rimas



List No. 1655M

### Over and Under Size Set

In Plastic Pouch

SIZES	PCS.	EDP NO.
.1565	.2766	.3927
.1585	.3140	.3947
.2352	.3160	.4714
.2372	.3533	.4734
.2746	.3553	
	14	23304



### Standard Size Set

In Metal Indexed Case

SIZES	PIECES	EDP NO.
1.0mm to 13.0mm by .5mm	25	23305

# Cobalt Straight Shank Chucking Reamers

Alésoir au cobalt

Rima de cobalto



## Straight Flute — Right Hand Cut

45° Chamfer for reaming of most materials. **M42 8% Cobalt** steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for reaming high alloy steels, titanium, inconel, stainless steel and other difficult-to-ream materials. Longer tool life in production applications.

## List No. 2655 - Fractional

### Diameter Tolerances

up to 1/2" (including 12.5 mm) — +.0002/-0  
 over 1/2" to 5/8" — +.0003/-0  
 over 5/8" to 1 1/2" — +.0001/+0.0004

**STANDARD PACKAGE** All sizes — 1 each

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/16	.0625	.0585	1/2	2 1/2	4	<b>22400</b>
5/64	.0781	.0720	3/4	3	4	<b>22401</b>
3/32	.0938	.0880	3/4	3	4	<b>22402</b>
7/64	.1094	.1030	7/8	3 1/2	4	<b>22403</b>
1/8	.1250	.1190	7/8	3 1/2	4	<b>22404</b>
9/64	.1406	.1350	1	4	4	<b>22405</b>
5/32	.1562	.1510	1	4	6	<b>22406</b>
11/64	.1719	.1645	1 1/8	4 1/2	6	<b>22407</b>
3/16	.1875	.1805	1 1/8	4 1/2	6	<b>22408</b>
13/64	.2031	.1945	1 1/4	5	6	<b>22409</b>
7/32	.2188	.2075	1 1/4	5	6	<b>22410</b>
15/64	.2344	.2265	1 1/2	6	6	<b>22411</b>
1/4	.2500	.2405	1 1/2	6	6	<b>22413</b>
17/64	.2656	.2485	1 1/2	6	6	<b>22415</b>
9/32	.2812	.2485	1 1/2	6	6	<b>22416</b>
19/64	.2969	.2792	1 1/2	6	6	<b>22417</b>
5/16	.3125	.2792	1 1/2	6	6	<b>22419</b>
21/64	.3281	.2792	1 1/2	6	6	<b>22421</b>
11/32	.3438	.2792	1 1/2	6	6	<b>22422</b>
23/64	.3594	.3105	1 3/4	7	6	<b>22423</b>
3/8	.3750	.3105	1 3/4	7	6	<b>22425</b>
25/64	.3906	.3105	1 3/4	7	6	<b>22427</b>
13/32	.4062	.3105	1 3/4	7	6	<b>22428</b>

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
27/64	.4219	.3730	1 3/4	7	6	<b>22429</b>
7/16	.4375	.3730	1 3/4	7	6	<b>22431</b>
29/64	.4531	.3730	1 3/4	7	6	<b>22433</b>
15/32	.4688	.3730	1 3/4	7	6	<b>22434</b>
31/64	.4844	.4355	2	8	6	<b>22435</b>
1/2	.5000	.4355	2	8	6	<b>22437</b>
17/32	.5312	.4355	2	8	6	<b>22440</b>
9/16	.5625	.4355	2	8	8	<b>22443</b>
19/32	.5938	.4355	2	8	8	<b>22445</b>
5/8	.6250	.5615	2 1/4	9	8	<b>22448</b>
21/32	.6562	.5615	2 1/4	9	8	<b>22451</b>
11/16	.6875	.5615	2 1/4	9	8	<b>22454</b>
23/32	.7188	.5615	2 1/4	9	8	<b>22457</b>
3/4	.7500	.6240	2 1/2	9 1/2	8	<b>22460</b>
25/32	.7812	.6240	2 1/2	9 1/2	8	<b>22463</b>
13/16	.8125	.6240	2 1/2	9 1/2	8	<b>22466</b>
27/32	.8438	.6240	2 1/2	9 1/2	8	<b>22469</b>
7/8	.8750	.7490	2 5/8	10	8	<b>22472</b>
29/32	.9062	.7490	2 5/8	10	8	<b>22475</b>
15/16	.9375	.7490	2 5/8	10	8	<b>22478</b>
31/32	.9688	.7490	2 5/8	10	8	<b>22481</b>
1	1.000	.8740	2 3/4	10 1/2	8	<b>22484</b>

## List 2655M — Cobalt Metric Sizes

MM SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1.0	.0394	.0394	1/2	2 1/2	4	<b>22515</b>
1.5	.0591	.0510	1/2	2 1/2	4	<b>22516</b>
2.0	.0787	.0720	3/4	3	4	<b>22517</b>
2.5	.0984	.0928	7/8	3 1/2	4	<b>22518</b>
3.0	.1181	.1120	7/8	3 1/2	4	<b>22519</b>
3.5	.1378	.1350	1	4	4	<b>22520</b>
4.0	.1575	.1510	1	4	6	<b>22521</b>
4.5	.1772	.1704	1 1/8	4 1/2	6	<b>22522</b>
5.0	.1969	.1895	1 1/4	5	6	<b>22523</b>
5.5	.2165	.2075	1 1/4	5	6	<b>22524</b>
6.0	.2362	.2265	1 1/2	6	6	<b>22525</b>
6.5	.2559	.2405	1 1/2	6	6	<b>22526</b>
7.0	.2756	.2485	1 1/2	6	6	<b>22527</b>

MM SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
7.5	.2953	.2792	1 1/2	6	6	<b>22528</b>
8.0	.3150	.2792	1 1/2	6	6	<b>22529</b>
8.5	.3346	.2792	1 1/2	6	6	<b>22530</b>
9.0	.3543	.3105	1 3/4	7	6	<b>22531</b>
9.5	.3740	.3105	1 3/4	7	6	<b>22532</b>
10.0	.3937	.3105	1 3/4	7	6	<b>22533</b>
10.5	.4134	.3730	1 3/4	7	6	<b>22534</b>
11.0	.4331	.3730	1 3/4	7	6	<b>22535</b>
11.5	.4528	.3730	1 3/4	7	6	<b>22536</b>
12.0	.4724	.4355	2	8	6	<b>22537</b>
12.5	.4921	.4355	2	8	6	<b>22538</b>

## TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Decimal Size Straight Shank Chucking Reamers

High Speed Steel

Straight Flute — Right Hand Cut

.0005" Increments

45° Chamfer for reaming of most materials.

Alésoir machine

Rima de máquina



List No. 1655H

Diameter Tolerances

up to .5000 — +.0002/-0

.5005 to .6250 — +.0003/-0

.6255 to 1.0030 — +.0001/+0.0004

**STANDARD PACKAGE** All sizes - 1 each

Over / Under Sizes:  
Pages 85-87  
Dowel Pin Sizes:  
Page 94

DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.
.0300	29000	.0560	29047	.0835	29092	.1115	29137
.0305	29001	.0565	29048	.0840	29093	.1120	29138
.0310	29002	.0570	29049	.0845	29094	.1125	29139
.0315	29004	.0575	29050	.0850	29095	.1135	29140
.0320	29005	.0580	29051	.0855	29096	.1140	29141
.0325	29006	.0585	29052	.0865	29097	.1145	29142
.0330	29007	.0590	29053	.0870	29098	.1150	29143
.0335	29008	.0600	29054	.0875	29099	.1155	29144
.0340	29009	.0605	29055	.0880	29100	.1165	29146
.0345	29010	.0610	29056	.0885	29101	.1170	29147
.0350	29011	.0615	29057	.0895	29102	.1175	29148
.0355	29012	.0620	29058	.0900	29103	.1180	29149
.0360	29013	.0630	29059	.0905	29104	.1185	29150
.0365	29014	.0640	29060	.0910	29105	.1190	29151
.0370	29015	.0645	29061	.0915	29106	.1195	29152
.0375	29016	.0650	29062	.0920	29107	.1205	29153
.0380	29017	.0655	29063	.0925	29108	.1210	29154
.0385	29018	.0660	29064	.0930	29109	.1215	29155
.0390	29019	.0665	29065	.0940	29110	.1220	29156
.0395	29021	.0675	29066	.0945	29111	.1225	29157
.0405	29022	.0680	29067	.0950	29112	.1235	29158
.0415	29023	.0685	29068	.0955	29113	.1245	29159
.0425	29024	.0690	29069	.0965	29114	.1255	29160
.0435	29025	.0695	29070	.0970	29115	.1265	29161
.0440	29026	.0705	29071	.0975	29116	.1270	29162
.0445	29027	.0710	29072	.0985	29117	.1275	29163
.0450	29028	.0715	29073	.0990	29118	.1280	29164
.0455	29029	.0720	29074	.1000	29119	.1290	29165
.0460	29030	.0725	29075	.1005	29120	.1295	29166
.0470	29031	.0735	29076	.1010	29121	.1300	29167
.0475	29032	.0740	29077	.1020	29122	.1305	29168
.0480	29033	.0745	29078	.1025	29123	.1310	29169
.0485	29034	.0750	29079	.1030	29124	.1315	29170
.0490	29035	.0755	29080	.1035	29125	.1320	29171
.0495	29036	.0765	29081	.1045	29126	.1325	29172
.0500	29037	.0770	29082	.1050	29127	.1330	29173
.0505	29038	.0775	29083	.1055	29128	.1335	29174
.0510	29039	.0780	29084	.1060	29129	.1340	29175
.0515	29040	.0790	29085	.1070	29130	.1345	29176
.0525	29041	.0795	29086	.1075	29131	.1350	29177
.0530	29042	.0800	29087	.1080	29132	.1355	29178
.0535	29043	.0805	29088	.1085	29133	.1365	29179
.0540	29044	.0815	29089	.1090	29134	.1370	29180
.0545	29045	.0825	29090	.1095	29135	.1375	29181
.0555	29046	.0830	29091	.1105	29136		

(continued)

# Decimal Size Chucking Reamers (continued)

List No. 1655H

Alésoir machine

Rima de máquina

DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.
.1380	29182	.1685	29233	.2020	29283	.2305	29333	.2605	29383
.1385	29183	.1690	29234	.2025	29284	.2310	29334	.2615	29384
.1390	29184	.1700	29235	.2030	29285	.2315	29335	.2620	29385
.1395	29185	.1705	29236	.2035	29286	.2320	29336	.2625	29386
.1400	29186	.1710	29237	.2045	29287	.2325	29337	.2630	29387
.1410	29187	.1715	29238	.2050	29288	.2330	29338	.2635	29388
.1415	29188	.1720	29239	.2060	29289	.2335	29339	.2640	29389
.1420	29189	.1725	29240	.2065	29290	.2345	29340	.2645	29390
.1425	29190	.1735	29241	.2070	29291	.2350	29341	.2650	29391
.1430	29191	.1740	29242	.2075	29292	.2355	29342	.2655	29392
.1435	29192	.1745	29243	.2080	29293	.2360	29343	.2665	29393
.1445	29193	.1750	29244	.2085	29294	.2365	29344	.2670	29394
.1450	29194	.1755	29245	.2095	29295	.2370	29345	.2675	29395
.1455	29195	.1760	29246	.2100	29296	.2375	29346	.2680	29396
.1460	29196	.1765	29247	.2105	29297	.2385	29347	.2685	29397
.1465	29197	.1775	29248	.2110	29298	.2390	29348	.2690	29398
.1475	29198	.1780	29249	.2115	29299	.2395	29349	.2695	29399
.1480	29199	.1785	29250	.2120	29300	.2400	29350	.2700	29400
.1485	29200	.1790	29251	.2125	29301	.2405	29351	.2705	29401
.1490	29201	.1795	29252	.2135	29302	.2410	29352	.2710	29402
.1500	29202	.1805	29253	.2140	29303	.2415	29353	.2715	29403
.1505	29203	.1810	29254	.2145	29304	.2425	29354	.2725	29404
.1510	29204	.1815	29255	.2150	29305	.2430	29355	.2730	29405
.1515	29205	.1825	29256	.2155	29306	.2435	29356	.2735	29406
.1525	29206	.1830	29257	.2160	29307	.2440	29357	.2740	29407
.1530	29207	.1835	29258	.2170	29308	.2445	29358	.2745	29408
.1535	29208	.1840	29259	.2175	29309	.2450	29359	.2750	29409
.1545	29209	.1845	29260	.2180	29310	.2455	29360	.2755	29410
.1550	29210	.1860	29261	.2185	29311	.2465	29361	.2760	29411
.1555	29211	.1880	29262	.2190	29312	.2470	29362	.2765	29412
.1560	29212	.1895	29263	.2195	29313	.2475	29363	.2775	29413
.1565	29213	.1900	29264	.2200	29314	.2485	29364	.2780	29414
.1580	29214	.1905	29265	.2205	29315	.2505	29365	.2785	29415
.1585	29215	.1915	29266	.2215	29316	.2515	29366	.2790	29416
.1595	29216	.1920	29267	.2220	29317	.2520	29367	.2795	29417
.1600	29217	.1925	29268	.2225	29318	.2525	29368	.2800	29418
.1605	29218	.1930	29269	.2230	29319	.2530	29369	.2805	29419
.1615	29220	.1940	29270	.2235	29320	.2535	29370	.2815	29420
.1620	29221	.1945	29271	.2240	29321	.2540	29371	.2820	29421
.1625	29222	.1950	29272	.2245	29322	.2545	29372	.2825	29422
.1630	29223	.1955	29273	.2250	29323	.2550	29373	.2830	29423
.1635	29224	.1965	29274	.2255	29324	.2555	29374	.2835	29424
.1640	29225	.1970	29275	.2260	29325	.2560	29375	.2840	29425
.1645	29226	.1975	29276	.2265	29326	.2565	29376	.2845	29426
.1650	29227	.1980	29277	.2270	29327	.2575	29377	.2850	29427
.1655	29228	.1985	29278	.2275	29328	.2580	29378	.2855	29428
.1665	29229	.1995	29279	.2285	29329	.2585	29379	.2860	29429
.1670	29230	.2000	29280	.2290	29330	.2590	29380	.2865	29430
.1675	29231	.2005	29281	.2295	29331	.2595	29381	.2870	29431
.1680	29232	.2015	29282	.2300	29332	.2600	29382	.2875	29432
								.2880	29433

(continued)

# Decimal Size Chucking Reamers (continued)

List No. 1655H

Alésoir machine

Rima de máquina

Over / Under Sizes:  
Pages 85-87Dowel Pin Sizes:  
Page 94

DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.
.2885	29434	.3185	29485	.3450	29535	.3715	29585	.4005	29635
.2890	29435	.3190	29486	.3455	29536	.3720	29586	.4010	29636
.2895	29436	.3195	29487	.3460	29537	.3725	29587	.4015	29637
.2905	29437	.3200	29488	.3465	29538	.3735	29588	.4020	29638
.2910	29438	.3205	29489	.3470	29539	.3755	29589	.4025	29639
.2915	29439	.3210	29490	.3475	29540	.3765	29590	.4030	29640
.2920	29440	.3215	29491	.3485	29541	.3775	29591	.4035	29641
.2925	29441	.3220	29492	.3490	29542	.3780	29592	.4045	29642
.2930	29442	.3225	29493	.3495	29543	.3785	29593	.4050	29643
.2935	29443	.3235	29494	.3500	29544	.3790	29594	.4055	29644
.2940	29444	.3240	29495	.3505	29545	.3795	29595	.4060	29645
.2945	29445	.3245	29496	.3510	29546	.3800	29596	.4065	29646
.2955	29446	.3250	29497	.3515	29547	.3805	29597	.4070	29647
.2960	29447	.3255	29498	.3520	29548	.3810	29598	.4075	29648
.2965	29448	.3260	29499	.3525	29549	.3815	29599	.4080	29649
.2970	29449	.3265	29500	.3530	29550	.3820	29600	.4085	29650
.2975	29450	.3270	29501	.3535	29551	.3825	29601	.4090	29651
.2980	29451	.3275	29502	.3540	29552	.3830	29602	.4095	29652
.2985	29452	.3280	29503	.3545	29553	.3835	29603	.4100	29653
.2990	29453	.3285	29504	.3550	29554	.3840	29604	.4105	29654
.2995	29454	.3290	29505	.3555	29555	.3845	29605	.4110	29655
.3000	29455	.3295	29506	.3560	29556	.3850	29606	.4115	29656
.3005	29456	.3300	29507	.3565	29557	.3855	29607	.4120	29657
.3010	29457	.3305	29508	.3570	29558	.3865	29608	.4125	29658
.3015	29458	.3310	29509	.3575	29559	.3870	29609	.4135	29659
.3025	29459	.3315	29510	.3585	29560	.3875	29610	.4140	29660
.3030	29460	.3325	29511	.3590	29561	.3880	29611	.4145	29661
.3035	29461	.3330	29512	.3595	29562	.3885	29612	.4150	29662
.3040	29462	.3335	29513	.3600	29563	.3890	29613	.4155	29663
.3045	29463	.3340	29514	.3605	29564	.3895	29614	.4160	29664
.3050	29464	.3345	29515	.3610	29565	.3900	29615	.4165	29665
.3055	29465	.3350	29516	.3615	29566	.3905	29616	.4170	29666
.3060	29466	.3355	29517	.3620	29567	.3910	29617	.4175	29667
.3065	29467	.3360	29518	.3625	29568	.3915	29618	.4180	29668
.3070	29468	.3365	29519	.3630	29569	.3920	29619	.4185	29669
.3075	29469	.3370	29520	.3635	29570	.3925	29620	.4190	29670
.3080	29470	.3375	29521	.3640	29571	.3930	29621	.4195	29671
.3085	29471	.3380	29522	.3645	29572	.3935	29622	.4200	29672
.3090	29472	.3385	29523	.3650	29573	.3940	29623	.4205	29673
.3095	29473	.3395	29524	.3655	29574	.3945	29624	.4210	29674
.3100	29474	.3400	29525	.3660	29575	.3950	29625	.4215	29675
.3110	29475	.3405	29526	.3665	29576	.3955	29626	.4220	29676
.3130	29476	.3410	29527	.3670	29577	.3960	29627	.4225	29677
.3140	29478	.3415	29528	.3675	29578	.3965	29628	.4230	29678
.3145	29479	.3420	29529	.3685	29579	.3975	29629	.4235	29679
.3155	29480	.3425	29530	.3690	29580	.3980	29630	.4240	29680
.3165	29481	.3430	29531	.3695	29581	.3985	29631	.4245	29681
.3170	29482	.3435	29532	.3700	29582	.3990	29632	.4250	29682
.3175	29483	.3440	29533	.3705	29583	.3995	29633	.4255	29683
.3180	29484	.3445	29534	.3710	29584	.4000	29634	.4260	29684
								.4265	29685
								.4270	29686

(continued)

# Decimal Size Chucking Reamers (continued)

List No. 1655H

Alésoir machine

Rima de máquina

DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.	DEC. SIZE	EDP NO.
.4275	29687	.4550	29737	.4800	29787	.5600	29837	.8105	29885
.4280	29688	.4555	29738	.4805	29788	.5605	29838	.8110	29886
.4285	29689	.4560	29739	.4810	29789	.5610	29839	.8115	29887
.4290	29690	.4565	29740	.4815	29790	.5615	29932	.8120	29888
.4295	29691	.4570	29741	.4820	29791	.5620	29840	.8130	29889
.4300	29692	.4575	29742	.4825	29792	.5630	29841	.8135	29890
.4305	29693	.4580	29743	.4830	29793	.5635	29933	.8140	29891
.4310	29694	.4585	29744	.4835	29794	.5640	29842	.8145	29892
.4315	29695	.4590	29745	.4840	29795	.5645	29843	.8150	29893
.4320	29696	.4595	29746	.4845	29796	.5650	29844	.8155	29894
.4325	29697	.4600	29747	.4850	29797	.5655	29845	.8720	29895
.4330	29698	.4605	29748	.4855	29798	.6220	29846	.8725	29896
.4335	29699	.4610	29749	.4860	29799	.6225	29847	.8730	29897
.4340	29700	.4615	29750	.4865	29800	.6230	29848	.8735	29898
.4345	29701	.4620	29751	.4870	29801	.6235	29849	.8740	29899
.4350	29702	.4625	29752	.4875	29802	.6240	29850	.8745	29900
.4360	29703	.4630	29753	.4880	29803	.6245	29851	.8755	29901
.4380	29704	.4635	29754	.4885	29804	.6255	29852	.8760	29902
.4390	29705	.4640	29755	.4890	29805	.6260	29853	.8765	29903
.4395	29706	.4645	29756	.4895	29806	.6265	29854	.8770	29904
.4400	29707	.4650	29757	.4900	29807	.6270	29855	.8775	29905
.4405	29708	.4655	29758	.4905	29808	.6275	29856	.8780	29906
.4410	29709	.4660	29759	.4910	29809	.6280	29857	.9340	29907
.4415	29710	.4665	29760	.4915	29810	.6845	29858	.9345	29908
.4420	29711	.4670	29761	.4920	29811	.6850	29859	.9350	29909
.4425	29712	.4675	29762	.4925	29812	.6855	29860	.9355	29910
.4430	29713	.4680	29763	.4930	29813	.6860	29861	.9360	29911
.4435	29714	.4685	29764	.4935	29814	.6865	29862	.9365	29912
.4440	29715	.4690	29765	.4940	29815	.6870	29863	.9370	29913
.4445	29716	.4695	29766	.4945	29816	.6880	29864	.9380	29914
.4450	29717	.4700	29767	.4950	29817	.6885	29865	.9385	29915
.4455	29718	.4705	29768	.4955	29818	.6890	29866	.9390	29916
.4460	29719	.4710	29769	.4960	29819	.6895	29867	.9395	29917
.4465	29720	.4715	29770	.4965	29820	.6900	29868	.9400	29918
.4470	29721	.4720	29771	.4970	29821	.6905	29869	.9405	29919
.4475	29722	.4725	29772	.4975	29822	.7470	29870	.9970	29920
.4480	29723	.4730	29773	.4985	29823	.7475	29871	.9975	29921
.4485	29724	.4735	29774	.5005	29824	.7485	29872	.9980	29922
.4490	29725	.4740	29775	.5015	29825	.7490	29873	.9985	29923
.4495	29726	.4745	29776	.5020	29826	.7495	29874	.9990	29924
.4500	29727	.4750	29777	.5025	29827	.7505	29875	.9995	29925
.4505	29728	.4755	29778	.5030	29828	.7510	29876	1.0005	29926
.4510	29729	.4760	29779	.5035	29829	.7515	29877	1.0010	29927
.4515	29730	.4765	29780	.5040	29830	.7520	29878	1.0015	29928
.4520	29731	.4770	29781	.5045	29831	.7525	29879	1.0020	29929
.4525	29732	.4775	29782	.5050	29832	.7530	29880	1.0025	29930
.4530	29733	.4780	29783	.5060	29833	.7540	29881	1.0030	29931
.4535	29734	.4785	29784	.5070	29834	.7550	29882		
.4540	29735	.4790	29785	.5090	29835	.8095	29883		
.4545	29736	.4795	29786	.5100	29836	.8100	29884		

Reamers

## Intermediate Size Straight Shank Chuckling Reamers

High Speed Steel  
Straight Flute – Right Hand Cut

Alésoir machine

Rima de máquina



List No. 1655I

Size Range .0100"-1.9999"

### Price on Application

## Dowel Pin Size Straight Shank Chuckling Reamers

High Speed Steel — Right Hand Cut  
Straight Flute

45° Chamfer for reaming of most materials.  
Dowel Pin Reamers are produced with increased back taper and a minus diameter tolerance.  
Chuckling Reamers are produced with minimal back taper and a plus diameter tolerance.

Alésoir machine

Rima de máquina



List No. 1655D

STANDARD All sizes – 1 each  
PACKAGE

DIAMETER TOLERANCES +.0000, -.0002

Over / Under Sizes:  
Pages 85-87  
Decimal Sizes:  
Pages 90-93

DECIMAL SIZE	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
.1230	7/8	3 1/2	4	21561
.1247	7/8	3 1/2	4	21562
.1855	1 1/8	4 1/2	6	21563
.1870	1 1/8	4 1/2	6	21564
.2480	1 1/2	6	6	21565
.2495	1 1/2	6	6	21566
.3105	1 1/2	6	6	21567

DECIMAL SIZE	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
.3120	1 1/2	6	6	21568
.3730	1 3/4	7	6	21569
.3745	1 3/4	7	6	21570
.4355	1 3/4	7	6	21571
.4370	1 3/4	7	6	21572
.4980	2	8	6	21573
.4995	2	8	6	21574

## Reamer Terminology

**Machine Chucking Reamer** — Used primarily in machines such as turret lathes, transfer lines, numerical control, etc. for production reaming.

**Hand Reamer** — Used primarily by hand utilizing wrench and driven by the square. Excellent for tool and die work, machine and repair shop. May be machine driven in some cases.

**Shank** — The part of the reamer which is held and driven.

**Neck** — The section of reduced diameter between the body and the shank.

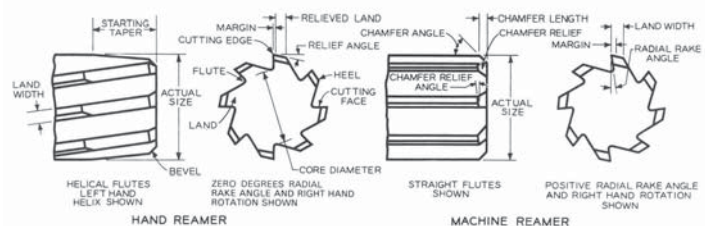
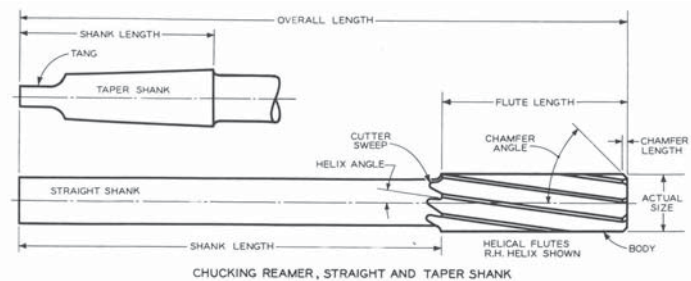
**Diameter** — The diameter over the body of the reamer measured at the point.

**Chamfer** — The leading cutting edge of the reamer, usually 45°.

**Clearance** — The relief on the outside diameter of the reamer, usually running to a theoretically sharp edge or cylindrical margin as the material to be reamed dictates.

**Flutes** — Helical or straight grooves cut or formed in the body of the reamer to permit chip flow and form lands for proper clearance.

**Overall Length** — The length from the extreme end of the shank to the extreme end of the body section. Does not include conical point when used as in structural reamers.





# Carbide Tipped Straight Shank Chucking Reamers

Alésoir à pointe au carbure

Rima con punta de carburo



Reamers

## Straight Flute — Right Hand Cut

**Carbide Tipped** offers excellent wear resistance for general reaming of steel, cast iron, plastics, and other abrasive non-ferrous materials. Longer tool life in production applications.

List No. 5655

**STANDARD PACKAGE** All sizes — 1 each

Tools are furnished to a +.0003 -.0000 diameter tolerance.

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/16	.1875	11/64	1 1/8	4 1/2	4	55212
13/64	.2031	11/64	1 1/8	4 1/2	4	55213*
7/32	.2187	13/64	1 1/4	5	4	55214
1/4	.2500	15/64	1 1/2	6	4	55216
9/32	.2812	15/64	1 1/2	6	4	55218
19/64	.2969	9/32	1 1/2	6	4	55219
5/16	.3125	9/32	1 1/2	6	4	55220
21/64	.3281	9/32	1 1/2	6	4	55221
11/32	.3437	9/32	1 1/2	6	4	55222
3/8	.3750	5/16	1 3/4	7	4	55224
13/32	.4062	5/16	1 3/4	7	4	55226
27/64	.4219	3/8	1 3/4	7	4	55227*
7/16	.4375	3/8	1 3/4	7	4	55228
29/64	.4531	3/8	1 3/4	7	4	55229*
15/32	.4688	3/8	1 3/4	7	4	55230
31/64	.4844	7/16	2	8	6	55231*
1/2	.5000	7/16	2	8	6	55232

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
17/32	.5312	7/16	2	8	6	55234
9/16	.5625	7/16	2	8	6	55236
19/32	.5938	7/16	2	8	6	55238*
5/8	.6250	9/16	2 1/4	9	6	55240
21/32	.6562	9/16	2 1/4	9	6	55242*
11/16	.6875	9/16	2 1/4	9	6	55244
45/64	.7031	9/16	2 1/4	9	6	55245*
23/32	.7187	9/16	2 1/4	9	6	55246*
47/64	.7344	5/8	2 1/2	9 1/2	6	55247*
3/4	.7500	5/8	2 1/2	9 1/2	6	55248
55/64	.8594	3/4	2 5/8	10	6	55255*
7/8	.8750	3/4	2 5/8	10	6	55256
57/64	.8906	3/4	2 5/8	10	6	55257*
15/16	.9375	3/4	2 5/8	10	8	55260*
1	1.0000	7/8	2 3/4	10 1/2	8	55264
15/16	1.3125	1	3	11 1/2	8	55320*
1 1/2	1.5000	1 1/4	3 1/2	12 1/2	8	55332*

\* Available While Supplies Last

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

# Expansion Straight Shank Chuckling Reamers

High Speed Steel  
Straight Flute — Right Hand Cut

Expansion Reamers are expandable to permit many regrinds to the original reamer size. Recommended for reaming a wide range of materials.

Alésoir expansible en bout

Rima de expansión



List No. 1733

STANDARD All sizes — 1 each  
PACKAGE

NOTE: Expansion feature is for expansion and regrind to the original reamer size only. Not to be used as an adjustable reamer for producing different hole sizes. Expansion screw should never be loosened to achieve a smaller reamer size.

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/8	.3750	5/16	3/4	7	6	22901
13/32	.4062	5/16	3/4	7	6	22902
7/16	.4375	3/8	7/8	7	6	22903
15/32	.4688	3/8	7/8	7	6	22904
1/2	.5000	7/16	1	8	6	22905
17/32	.5313	7/16	1	8	6	22906
9/16	.5625	7/16	1 1/8	8	6	22907
19/32	.5938	7/16	1 1/8	8	6	22908
5/8	.6250	9/16	1 1/4	9	6	22909
21/32	.6562	9/16	1 1/4	9	6	22910
11/16	.6875	9/16	1 1/4	9	6	22911
23/32	.7188	9/16	1 1/4	9	6	22912
3/4	.7500	5/8	1 3/8	9 1/2	6	22913
25/32	.7812	5/8	1 3/8	9 1/2	6	22914
13/16	.8125	5/8	1 3/8	9 1/2	6	22915
27/32	.8438	5/8	1 3/8	9 1/2	6	22916
7/8	.8750	3/4	1 1/2	10	6	22917
29/32	.9062	3/4	1 1/2	10	6	22918
15/16	.9375	3/4	1 1/2	10	6	22919
31/32	.9688	3/4	1 1/2	10	6	22920
1	1.0000	7/8	1 5/8	10 1/2	8	22921
1 1/16	1.0625	7/8	1 5/8	10 1/2	8	22922
1 1/8	1.1250	7/8	1 3/4	11	8	22923
1 3/16	1.1875	1	1 3/4	11	8	22924
1 1/4	1.2500	1	1 7/8	11 1/2	8	22925

# Carbide Tipped Expansion Straight Shank Chuckling Reamers

Straight Flute — Right Hand Cut

Expansion Reamers are expandable to permit many regrinds to the original reamer size. Carbide Tipped offers excellent wear resistance for general reaming of steel, cast iron, plastics, and other abrasive non-ferrous materials. Longer tool life in production applications.

Alésoir à pointe au carbure

Rima con punta de carburo



List No. 5733

NOTE: Expansion feature is for expansion and regrind to the original reamer size only. Not to be used as an adjustable reamer for producing different hole sizes. Expansion screw should never be loosened to achieve a smaller reamer size.

STANDARD All sizes — 1 each  
PACKAGE

SIZE	DEC. EQUIV.	SHANK DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/8	.3750	5/16	1	7	4	56003
7/16	.4375	3/8	1	7	4	56004
1/2	.5000	7/16	1	8	6	56005
9/16	.5625	7/16	1 1/8	8	6	56007
5/8	.6250	9/16	1 1/4	9	6	56009
11/16	.6875	9/16	1 1/4	9	6	56011
3/4	.7500	5/8	1 3/8	9 1/2	6	56013
13/16	.8125	5/8	1 3/8	9 1/2	6	56015
7/8	.8750	3/4	1 1/2	10	6	56017
15/16	.9375	3/4	1 1/2	10	8	56019
1	1.000	7/8	1 5/8	10 1/2	8	56021
1 1/8	1.1250	7/8	1 3/4	11	8	56025
1 1/4	1.2500	1	1 7/8	11 1/2	8	56027
1 3/8	1.3750	1	2	12	8	56029
1 1/2	1.5000	1 1/4	2 1/8	12 1/2	8	56031
1 11/16	1.6875	1 1/4	2 1/8	12 1/2	8	56039*
1 7/8	1.8750	1 1/4	2 1/8	12 1/2	8	56041*
1 15/16	1.9375	1 1/4	2 1/8	12 1/2	8	56042*

\* Available While Supplies Last

# Right Hand Helix Straight Shank Chucking Reamers

Alésoir machine

Rima de máquina



## High Speed Steel — Right Hand Cut

Right Hand Helix pulls chips out of the hole in blind hole and through hole applications, bridges interruptions and provides better finish and sizing than straight flute reamers. Recommended for reaming a wide range of materials.

## List No. 1653

45° Chamfer for reaming of most materials

**STANDARD PACKAGE** All sizes — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/16	.0625	1/2	2 1/2	4	21701
5/64	.0781	3/4	3	4	21702
3/32	.0938	3/4	3	4	21703
7/64	.1094	7/8	3 1/2	4	21704
1/8	.1250	7/8	3 1/2	4	21705
9/64	.1406	1	4	4	21706
5/32	.1562	1	4	6	21707
11/64	.1719	1 1/8	4 1/2	6	21708
3/16	.1875	1 1/8	4 1/2	6	21709
13/64	.2031	1 1/4	5	6	21710
7/32	.2188	1 1/4	5	6	21711
15/64	.2344	1 1/2	6	6	21712
1/4	.2500	1 1/2	6	6	21713
17/64	.2656	1 1/2	6	6	21714
9/32	.2812	1 1/2	6	6	21715
19/64	.2969	1 1/2	6	6	21716
5/16	.3125	1 1/2	6	6	21717
21/64	.3281	1 1/2	6	6	21718
11/32	.3438	1 1/2	6	6	21719
23/64	.3594	1 3/4	7	6	21720
3/8	.3750	1 3/4	7	6	21721
25/64	.3906	1 3/4	7	6	21722
13/32	.4062	1 3/4	7	6	21723
27/64	.4219	1 3/4	7	6	21724
7/16	.4375	1 3/4	7	6	21725
29/64	.4531	1 3/4	7	6	21726
15/32	.4688	1 3/4	7	6	21727

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
31/64	.4844	2	8	6	21728
1/2	.5000	2	8	6	21729
17/32	.5313	2	8	6	21730
9/16	.5625	2	8	8	21731
19/32	.5938	2	8	8	21732
5/8	.6250	2 1/4	9	8	21733
21/32	.6562	2 1/4	9	8	21734
11/16	.6875	2 1/4	9	8	21735
23/32	.7188	2 1/4	9	8	21736
3/4	.7500	2 1/2	9 1/2	8	21737
25/32	.7812	2 1/2	9 1/2	8	21738
13/16	.8125	2 1/2	9 1/2	8	21739
27/32	.8438	2 1/2	9 1/2	8	21740
7/8	.8750	2 5/8	10	8	21741
29/32	.9062	2 5/8	10	8	21742
15/16	.9375	2 5/8	10	8	21743
31/32	.9688	2 5/8	10	8	21744
1	1.0000	2 3/4	10 1/2	8	21745
1 1/16	1.0625	2 3/4	10 1/2	8	21746
1 1/8	1.1250	2 7/8	11	10	21747
1 1/16	1.1875	2 7/8	11	10	21748
1 1/4	1.2500	3	11 1/2	10	21749
1 5/16	1.3125	3	11 1/2	10	21750
1 3/8	1.3750	3 1/4	12	10	21751
1 7/16	1.4375	3 1/4	12	10	21752
1 1/2	1.5000	3 1/2	12 1/2	10	21753

# Taper Shank Chucking Reamers

Alésoir machine

Rima de máquina



## High Speed Steel — Morse Taper Shank Straight Flute — Right Hand Cut

## List No. 1656

45° Chamfer for reaming of most materials.

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/4	1	.2500	1 1/2	6	6	22311
5/16	1	.3125	1 1/2	6	6	22313
11/32	1	.3438	1 1/2	6	6	22314
3/8	1	.3750	1 3/4	7	6	22315
13/32	1	.4062	1 3/4	7	6	22316
7/16	1	.4375	1 3/4	7	6	22317
15/32	1	.4688	1 3/4	7	6	22318
1/2	1	.5000	2	8	6	22319
17/32	1	.5313	2	8	6	22320
9/16	1	.5625	2	8	8	22321
19/32	1	.5938	2	8	8	22322
5/8	2	.6250	2 1/4	9	8	22323
21/32	2	.6562	2 1/4	9	8	22324
11/16	2	.6875	2 1/4	9	8	22325
23/32	2	.7188	2 1/4	9	8	22326
3/4	2	.7500	2 1/2	9 1/2	8	22327

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
25/32	2	.7812	2 1/2	9 1/2	8	22328
19/16	2	.8125	2 1/2	9 1/2	8	22329
27/32	2	.8438	2 1/2	9 1/2	8	22330
7/8	2	.8750	2 5/8	10	8	22331
29/32	2	.9062	2 5/8	10	8	22332
15/16	3	.9375	2 5/8	10	8	22333
31/32	3	.9688	2 5/8	10	8	22334
1	3	1.0000	2 3/4	10 1/2	8	22335
1 1/16	3	1.0625	2 3/4	10 1/2	8	22336
1 1/8	3	1.1250	2 7/8	11	10	22337
1 1/16	3	1.1875	2 7/8	11	10	22338
1 1/4	4	1.2500	3	11 1/2	10	22339
1 5/16	4	1.3125	3	11 1/2	10	22340
1 3/8	4	1.3750	3 1/4	12	10	22341
17/16	4	1.4375	3 1/4	12	10	22342
1 1/2	4	1.5000	3 1/2	12 1/2	10	22343

# Expansion Taper Shank Chucking Reamers

High Speed Steel — Morse Taper Shank  
Straight Flute — Right Hand Cut

Expansion Reamers are expandable to permit many regrinds to the original reamer size. Recommended for reaming a wide range of materials.

SIZE	DEC. EQUIV.	MORSE TAPER NO.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/8	.3750	1	3/4	7	6	22951
7/16	.4375	1	7/8	7	6	22952
1/2	.5000	1	1	8	6	22953
9/16	.5625	1	1 1/8	8	6	22955
5/8	.6250	2	1 1/4	9	6	22957
21/32	.6562	2	1 1/4	9	6	22958*
11/16	.6875	2	1 1/4	9	6	22959
23/32	.7188	2	1 1/4	9	6	22960*
3/4	.7500	2	1 3/8	9 1/2	6	22961
13/16	.8125	2	1 3/8	9 1/2	6	22962
7/8	.8750	2	1 1/2	10	6	22963
15/16	.9375	3	1 1/2	10	6	22964
1	1.0000	3	1 5/8	10 1/2	8	22965
1 1/16	1.0625	3	1 5/8	10 1/2	8	22966
1 1/8	1.1250	3	1 3/4	11	8	22967
1 1/16	1.1875	3	1 3/4	11	8	22968
1 1/4	1.2500	4	1 7/8	11 1/2	8	22969
1 3/8	1.3750	4	2	12	8	22971
1 7/16	1.4375	4	2	12	10	22972
1 1/2	1.5000	4	2 1/8	12 1/2	10	22973

\* Available While Supplies Last

# Right Hand Helix Taper Shank Chucking Reamers

High Speed Steel — Morse Taper Shank  
Right Hand Cut

Right Hand Helix pulls chips out of the hole in blind hole and through hole applications, bridges interruptions and provides better finish and sizing than straight flute reamers. Recommended for reaming a wide range of materials.

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/4	1	.2500	1 1/2	6	6	21851
5/16	1	.3125	1 1/2	6	6	21853
11/32	1	.3438	1 1/2	6	6	21854
3/8	1	.3750	1 3/4	7	6	21855
13/32	1	.4062	1 3/4	7	6	21856
7/16	1	.4375	1 3/4	7	6	21857
15/32	1	.4687	1 3/4	7	6	21858
1/2	1	.5000	2	8	6	21859
17/32	1	.5313	2	8	6	21860
9/16	1	.5625	2	8	8	21861
5/8	2	.6250	2 1/4	9	8	21863
21/32	2	.6562	2 1/4	9	8	21864
11/16	2	.6875	2 1/4	9	8	21865
23/32	2	.7188	2 1/4	9	8	21866
3/4	2	.7500	2 1/2	9 1/2	8	21867
25/32	2	.7812	2 1/2	9 1/2	8	21868

Alésoir expansible en bout

Rima de expansión



List No. 1734

NOTE: Expansion feature is for expansion and regrind to the original reamer size only. Not to be used as an adjustable reamer for producing different hole sizes. Expansion screw should never be loosened to achieve a smaller reamer size.

STANDARD PACKAGE All sizes — 1 each

Alésoir machine

Rima de máquina



List No. 1654

45° Chamfer for reaming of most materials

Diameter Tolerances

up to 1/2" — +.0002/-0

over 1/2" to 5/8" — +.0003/-0

over 5/8" to 1 1/2" — +.0001/+0.0004

STANDARD PACKAGE All sizes — 1 each

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
13/16	2	.8125	2 1/2	9 1/2	8	21869
27/32	2	.8438	2 1/2	9 1/2	8	21870
7/8	2	.8750	2 5/8	10	8	21871
29/32	2	.9062	2 5/8	10	8	21872
15/16	3	.9375	2 5/8	10	8	21873
31/32	3	.9688	2 5/8	10	8	21874
1	3	1.0000	2 3/4	10 1/2	8	21875
1 1/16	3	1.0625	2 3/4	10 1/2	8	21876
1 1/8	3	1.1250	2 7/8	11	10	21877
1 1/16	3	1.1875	2 7/8	11	10	21878
1 1/4	4	1.2500	3	11 1/2	10	21879
1 5/16	4	1.3125	3	11 1/2	10	21880
1 3/8	4	1.3750	3 1/4	12	10	21881
1 7/16	4	1.4375	3 1/4	12	10	21882
1 1/2	4	1.5000	3 1/2	12 1/2	10	21883

# Solid Carbide Straight Shank Chucking Reamers Straight Flute

Alésoir au carbure

Rima de carburo



List No. 5661

STANDARD All sizes — 1 each  
PACKAGE

**TOLERANCES**

.0280" - .2500" - +.0000/+0.0002  
.2501" and up - +.0000/+0.0003

**NO. OF FLUTES**

Up to .2550" - 4 Flute  
Over .2550" - 6 Flute

Solid Carbide offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. High rigidity enhances hole accuracy and quality.

Recommended for general reaming of ferrous and non-ferrous materials including steel, alloy steel, stainless steel, plastic, aluminum and other abrasive non-ferrous materials.

Reamers

SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.
70	.0280	53950		.0470	53988		.0665	54028
	.0285	54736		.0475	53989	51	.0670	54029
	.0290	54737		.0480	53990		.0675	54030
69	.0292	53951		.0485	53991		.0680	54031
	.0295	54738		.0490	53992		.0685	54032
	.0300	53952		.0495	53993		.0690	54033
	.0305	54739		.0500	53994	50	.0695	54034
68	.0310	53953		.0505	53995		.0700	54035
1/32	.0312	53954		.0510	53996		.0705	54036
	.0315	53955		.0515	53997		.0710	54037
67	.0320	53956	55	.0520	53998		.0715	54038
	.0325	53957		.0525	53999		.0720	54039
66	.0330	53958		.0530	54000	49	.0725	54040
	.0335	53959		.0535	54001		.0730	54041
	.0340	53960		.0540	54002		.0735	54042
	.0345	53961		.0545	54003		.0740	54043
65	.0350	53962	54	.0550	54004		.0745	54044
	.0355	53963		.0555	54005		.0750	54045
64	.0360	53964		.0560	54006	48	.0755	54046
	.0365	53965		.0565	54007		.0760	54047
63	.0370	53966		.0570	54008		.0765	54048
	.0375	53967		.0575	54009		.0770	54049
62	.0380	53968		.0580	54010		.0775	54050
	.0385	53969		.0585	54011		.0780	54051
61	.0390	53970		.0590	54012	5/64	.0781	54052
1.0 mm	.0394	53971	1.5 mm	.0591	54013	47	.0785	54053
	.0395	53972	53	.0595	54014	2.0 mm	.0787	54054
60	.0400	53973		.0600	54015		.0790	54055
	.0405	53974		.0605	54016		.0795	54056
59	.0410	53975		.0610	54017		.0800	54057
	.0415	53976		.0615	54018		.0805	54058
58	.0420	53977		.0620	54019	46	.0810	54059
	.0425	53978		.0622	54740		.0815	54060
57	.0430	53979		.0623	54741	45	.0820	54061
	.0435	53980	1/16	.0625	54020		.0825	54062
	.0440	53981		.0630	54021		.0830	54063
	.0445	53982	52	.0635	54022		.0835	54064
	.0450	53983		.0640	54023		.0840	54065
	.0455	53984		.0645	54024		.0845	54066
	.0460	53985		.0650	54025		.0850	54067
56	.0465	53986		.0655	54026		.0855	54068
3/64	.0469	53987		.0660	54027	44	.0860	54069

Tool Coatings Also Available

(continued)

SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL
.0280"-.0415"	1/4	1-1/2	.0815"-.0965"	1/2	2	.1610"-.1915"	7/8	2-3/4	.3170"-.4160"	1-1/4	3-1/2
.0420"-.0650"	3/8	1-1/2	.0970"-.1300"	5/8	2-1/4	.1920"-.2555"	1	3	.4170"-.4780"	1-3/8	4
.0655"-.0810"	1/2	1-3/4	.1305"-.1605"	3/4	2-1/2	.2559"-.3165"	1-1/8	3-1/4	.4790"-.5625"	1-1/2	4
									.5905"-.7510"	1-3/4	4

# Solid Carbide Straight Shank Chucking Reamers

Alésoir au carbure

Rima de carburo



List No. 5661

STANDARD All sizes — 1 each  
PACKAGE

(continued)

SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.
	.0865	54070		.1115	54123	3.5 mm	.1378	54178
	.0870	54071		.1120	54124		.1380	54179
	.0875	54072	33	.1125	54125		.1385	54180
	.0880	54073		.1130	54126		.1390	54181
	.0885	54074		.1135	54127		.1395	54182
43	.0890	54075		.1140	54128		.1400	54183
	.0895	54076		.1145	54129	28	.1405	54184
	.0900	54077		.1150	54130	9/64	.1406	54185
	.0905	54078		.1155	54131		.1410	54186
	.0910	54079	32	.1160	54132		.1415	54187
	.0915	54080		.1165	54133		.1420	54188
	.0920	54081		.1170	54134		.1425	54189
	.0925	54082		.1175	54135		.1430	54190
	.0930	54083		.1180	54136		.1435	54191
	.0933	54742	3.0 mm	.1181	54137	27	.1440	54192
42	.0935	54084		.1185	54138		.1445	54193
	.0937	54743		.1190	54139		.1450	54194
3/32	.0938	54085		.1195	54140		.1455	54195
	.0940	54086	31	.1200	54141		.1460	54196
	.0945	54087		.1205	54142		.1465	54197
	.0950	54088		.1210	54143	26	.1470	54198
	.0955	54089		.1215	54144		.1475	54199
41	.0960	54090		.1220	54145		.1480	54200
	.0965	54091		.1225	54146		.1485	54201
	.0970	54092	.1230 D/P	.1230	54147		.1490	54202
	.0975	54093		.1235	54148	25	.1495	54203
40	.0980	54094	.1240 U/S	.1240	54149		.1500	54204
2.5 mm	.0984	54095		.1245	54150		.1505	54205
	.0985	54096	.1247 D/P	.1247	54151		.1507	54206
	.0990	54097	1/8	.1250	54152		.1510	54207
39	.0995	54098		.1255	54153		.1515	54208
	.1000	54099	.1260 O/S	.1260	54154	24	.1520	54209
	.1005	54100		.1265	54155		.1525	54210
	.1010	54101		.1270	54156		.1530	54211
38	.1015	54102		.1275	54157		.1535	54212
	.1020	54103		.1280	54158	23	.1540	54213
	.1025	54104	30	.1285	54159		.1541	54214
	.1030	54105		.1290	54160		.1545	54215
	.1035	54106		.1295	54161		.1550	54216
37	.1040	54107		.1300	54162		.1555	54217
	.1045	54108		.1305	54163	5/32	.1560	54218
	.1050	54109		.1310	54164		.1562	54219
	.1055	54110		.1315	54165		.1565	54220
	.1060	54111		.1320	54166	22	.1570	54221
36	.1065	54112		.1325	54167	4.0 mm	.1575	54222
	.1070	54113		.1330	54168		.1580	54223
	.1075	54114		.1335	54169		.1585	54224
	.1080	54115		.1340	54170	21	.1590	54225
	.1085	54116		.1345	54171		.1595	54226
	.1090	54117		.1350	54172		.1600	54227
7/64	.1094	54118		.1355	54173	20	.1605	54228
	.1095	54119	29	.1360	54174		.1610	54229
35	.1100	54120		.1365	54175		.1615	54230
	.1105	54121		.1370	54176		.1620	54231
34	.1110	54122		.1375	54177			

(continued)

SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL
.0280"-.0415"	1/4	1-1/2	.0815"-.0965"	1/2	2	.1610"-.1915"	7/8	2-3/4	.3170"-.4160"	1-1/4	3-1/2
.0420"-.0650"	3/8	1-1/2	.0970"-.1300"	5/8	2-1/4	.1920"-.2555"	1	3	.4170"-.4780"	1-3/8	4
.0655"-.0810"	1/2	1-3/4	.1305"-.1605"	3/4	2-1/2	.2559"-.3165"	1-1/8	3-1/4	.4790"-.5625"	1-1/2	4
									.5905"-.7510"	1-3/4	4

# Solid Carbide Straight Shank Chucking Reamers

Alésoir au carbure

Rima de carburo



List No. 5661

STANDARD PACKAGE All sizes — 1 each

(continued)

SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.
	.1625	54232	3/16	.1875	54286		.2135	54340
	.1630	54233		.1877	54745		.2140	54341
	.1635	54234		.1880	54287		.2145	54342
	.1640	54235	.1885 O/S	.1885	54288		.2150	54343
	.1645	54236	12	.1890	54289		.2155	54344
	.1650	54237		.1895	54290	5.5 mm	.2160	54345
19	.1655	54238		.1900	54291		.2165	54346
	.1660	54239		.1905	54292		.2170	54347
	.1665	54240	11	.1910	54293		.2175	54348
	.1670	54241		.1915	54294		.2177	54349
	.1675	54242		.1920	54295		.2180	54350
	.1680	54243		.1925	54296	7/32	.2185	54351
	.1685	54244		.1930	54297		.2188	54352
18	.1690	54245	10	.1935	54298		.2190	54353
	.1695	54246		.1940	54299		.2195	54354
	.1700	54247		.1945	54300		.2200	54355
	.1705	54248		.1950	54301	2	.2205	54356
	.1710	54249		.1955	54302		.2210	54357
11/64	.1715	54250	9	.1960	54303		.2215	54358
	.1719	54251		.1965	54304		.2220	54359
	.1720	54252	5.0 mm	.1969	54305		.2225	54360
	.1725	54253		.1970	54306		.2230	54361
17	.1730	54254		.1975	54307		.2235	54362
	.1735	54255		.1980	54308		.2240	54363
	.1740	54256		.1985	54309		.2245	54364
	.1745	54257	8	.1990	54310		.2250	54365
	.1750	54258		.1995	54311		.2255	54366
	.1755	54259		.2000	54312		.2260	54367
	.1760	54260		.2005	54313		.2265	54368
	.1765	54261	7	.2010	54314		.2270	54369
16	.1770	54262		.2015	54315		.2275	54370
4.5 mm	.1772	54263		.2020	54316	1	.2280	54371
	.1775	54264		.2025	54317		.2285	54372
	.1780	54265		.2030	54318		.2290	54373
	.1785	54266		.2031	54319		.2295	54374
	.1790	54267	13/64	.2035	54320		.2300	54375
	.1795	54268		.2040	54321		.2305	54376
15	.1800	54269	6	.2045	54322		.2310	54377
	.1805	54270		.2050	54323		.2315	54378
	.1810	54271	5	.2055	54324		.2320	54379
	.1814	54272		.2060	54325		.2325	54380
	.1815	54273		.2065	54326		.2330	54381
14	.1820	54274		.2070	54327		.2335	54382
	.1825	54275		.2075	54328	A	.2340	54383
	.1830	54276		.2080	54329	15/64	.2344	54384
	.1835	54277		.2085	54330		.2345	54385
	.1840	54278	4	.2090	54331		.2350	54386
	.1845	54279		.2095	54332		.2355	54387
13	.1850	54280		.2100	54333		.2360	54388
.1855 D/P	.1855	54281		.2105	54334	6.0 mm	.2362	54389
	.1860	54282		.2110	54335		.2365	54390
.1865 U/S	.1865	54283		.2115	54336		.2370	54391
	.1867	54744		.2120	54337		.2375	54392
.1870 D/P	.1870	54284		.2125	54338	B	.2380	54393
	.1872	54285	3	.2130	54339			

(continued)

SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL
.0280"-.0415"	1/4	1-1/2	.0815"-.0965"	1/2	2	.1610"-.1915"	7/8	2-3/4	.3170"-.4160"	1-1/4	3-1/2
.0420"-.0650"	3/8	1-1/2	.0970"-.1300"	5/8	2-1/4	.1920"-.2555"	1	3	.4170"-.4780"	1-3/8	4
.0655"-.0810"	1/2	1-3/4	.1305"-.1605"	3/4	2-1/2	.2559"-.3165"	1-1/8	3-1/4	.4790"-.5625"	1-1/2	4
									.5905"-.7510"	1-3/4	4

# Solid Carbide Straight Shank Chucking Reamers

Alésoir au carbure

Rima de carburo



List No. 5661

STANDARD All sizes — 1 each  
PACKAGE

(continued)

SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.
	.2385	54394	I	.2720	54449		.3170	54503
	.2390	54395		.2730	54450		.3175	54757
	.2395	54396		.2740	54451		.3177	54758
	.2400	54397		.2750	54452		.3180	54504
	.2405	54398	7.0 mm	.2756	54453		.3185	54759
	.2410	54399		.2760	54454		.3190	54505
C	.2415	54400	J	.2765	54751		.3195	54760
	.2420	54401		.2770	54455		.3200	54506
	.2425	54402		.2780	54456		.3210	54507
	.2430	54403		.2785	54752		.3220	54508
	.2435	54404		.2790	54457	P	.3230	54509
	.2440	54405		.2800	54458		.3240	54510
	.2445	54406		.2805	54753		.3250	54511
	.2450	54407	K	.2810	54459		.3255	54761
	.2455	54408	9/32	.2812	54460		.3260	54512
D	.2460	54409		.2818	54461		.3270	54513
	.2465	54410		.2820	54462	21/64	.3280	54514
	.2470	54411		.2830	54463		.3281	54515
	.2475	54412		.2840	54464		.3290	54516
.2480 D/P	.2480	54413		.2850	54465		.3300	54517
	.2485	54414		.2860	54466		.3310	54518
.2490 U/S	.2490	54415		.2870	54467	Q	.3320	54519
.2495 D/P	.2495	54416		.2880	54468		.3330	54520
	.2498	54746		.2890	54469		.3340	54521
1/4 (E)	.2500	54417	L	.2900	54470	8.5 mm	.3346	54522
	.2502	54747		.2910	54471		.3350	54523
	.2505	54418		.2920	54472		.3360	54524
.2510 O/S	.2510	54419		.2930	54473		.3365	54762
	.2515	54420		.2940	54474		.3370	54525
	.2520	54421	M	.2950	54475		.3380	54526
	.2525	54422	7.5 mm	.2953	54476		.3390	54527
	.2530	54423		.2960	54477	R	.3400	54528
	.2535	54424		.2969	54478		.3410	54529
	.2540	54425	19/64	.2970	54479		.3420	54530
	.2545	54426		.2980	54480		.3430	54531
	.2550	54427		.2990	54481	11/32	.3438	54532
	.2555	54748		.3000	54482		.3440	54533
6.5 mm	.2559	54428		.3010	54483		.3450	54534
	.2560	54429		.3020	54484		.3460	54535
	.2565	54430	N	.3030	54485		.3465	54763
F	.2570	54431		.3040	54486		.3470	54536
	.2575	54432		.3050	54487	S	.3480	54537
	.2580	54433		.3060	54488		.3490	54538
	.2590	54434		.3070	54489		.3500	54539
	.2600	54435		.3080	54490		.3510	54540
G	.2610	54436		.3090	54491		.3520	54541
	.2620	54437		.3100	54492		.3530	54542
	.2630	54438	.3105 D/P	.3105	54493		.3540	54543
	.2635	54439		.3110	54494	9.0 mm	.3543	54544
	.2640	54440	.3115 U/S	.3115	54495		.3550	54545
	.2650	54441	.3120 D/P	.3120	54496		.3560	54546
	.2655	54749	5/16	.3125	54497		.3570	54547
	.2656	54442		.3130	54498	T	.3580	54548
	.2660	54443	.3135 O/S	.3135	54499		.3590	54549
	.2670	54444		.3140	54500	23/64	.3594	54550
	.2680	54445		.3145	54754		.3600	54551
	.2685	54750	8.0 mm	.3150	54501		.3610	54552
	.2690	54446		.3155	54755		.3620	54553
	.2700	54447	O	.3160	54502		.3630	54554
	.2710	54448		.3165	54756		.3640	54555

(continued)

SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL
.0280"-.0415"	1/4	1-1/2	.0815"-.0965"	1/2	2	.1610"-.1915"	7/8	2-3/4	.3170"-.4160"	1-1/4	3-1/2
.0420"-.0650"	3/8	1-1/2	.0970"-.1300"	5/8	2-1/4	.1920"-.2555"	1	3	.4170"-.4780"	1-3/8	4
.0655"-.0810"	1/2	1-3/4	.1305"-.1605"	3/4	2-1/2	.2559"-.3165"	1-1/8	3-1/4	.4790"-.5625"	1-1/2	4
									.5905"-.7510"	1-3/4	4



# Solid Carbide Straight Shank Chucking Reamers

Alésoir au carbure

Rima de carburo



List No. 5661

STANDARD All sizes — 1 each  
PACKAGE

(continued)

SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	SIZE	DEC. SIZE	EDP NO.	
U	.3650	54556	27/64	.4160	54614	12.0 mm	.4690	54675	
	.3660	54557		.4170	54615		.4700	54676	
	.3670	54558		.4180	54616		.4710	54677	
	.3675	54764		.4190	54617		.4720	54678	
	.3680	54559		.4200	54618		.4724	54679	
	.3690	54560		.4210	54619		.4730	54680	
	.3700	54561		.4219	54620		.4740	54681	
	.3710	54562		.4230	54621		.4750	54682	
	.3720	54563		.4240	54622		.4760	54683	
	.3730 D/P	54564		.4250	54623		.4770	54684	
9.5 mm 3/8	.3735	54765	11.0 mm	.4260	54624	31/64	.4780	54685	
	.3740	54565		.4270	54625		.4790	54686	
	.3745 D/P	54566		.4280	54626		.4800	54687	
	.3750	54567		.4290	54627		.4805	54688	
	.3755	54568		.4300	54628		.4810	54689	
	.3760 O/S	54569		.4310	54629		.4820	54690	
	V	.3765		54570	.4320		54630	.4830	54691
		.3770		54571	.4330		54631	.4840	54692
		.3780		54572	.4331		54632	.4844	54693
		.3790		54573	.4340		54633	.4850	54694
.3795		54766	.4350	54634	.4860	54695			
.3800		54574	.4355	54635	.4870	54696			
.3810		54575	.4360	54636	.4880	54697			
.3820		54576	.4365	54637	.4890	54698			
.3830		54577	.4370 D/P	54638	.4900	54699			
W		.3840	54578	7/16	.4375	54639	12.5 mm	.4910	54700
	.3850	54579	.4380	54640	.4921	54701			
	.3860	54580	.4385 O/S	54641	.4930	54702			
	.3870	54581	.4390	54642	.4940	54703			
	.3880	54582	.4400	54643	.4950	54704			
	.3890	54583	.4410	54644	.4960	54705			
	.3900	54584	.4420	54645	.4970	54706			
	.3906	54585	.4430	54646	.4980 D/P	54707			
	.3910	54586	.4440	54647	.4990 U/S	54708			
	.3920	54587	.4450	54648	.4995 D/P	54709			
10.0 mm	.3930	54588	11.5 mm	.4460	54649	1/2	.5000	54710	
	.3937	54589		.4470	54650		.5005	54711	
	.3940	54590		.4480	54651		.5010 O/S	54712	
	.3950	54591		.4490	54652		.5015	54713	
	.3960	54592		.4500	54653		.5020	54714	
	.3970	54593		.4510	54654		.5030	54715	
	.3980	54594		.4520	54655		.5040	54716	
	.3990	54595		.4528	54656		.5050	54717	
	.4000	54596		.4530	54657		.5118	54718	
	.4010	54597		.4531	54658		.5512	54719	
X	.4020	54598	29/64	.4540	54659	9/16	.5625	54720	
	.4030	54599		.4550	54660		.5905	54721	
	.4040	54600		.4560	54661		.6235	54722	
	.4050	54601		.4570	54662		.6240	54723	
	.4060	54602		.4580	54663		.6245	54724	
	.4062	54603		.4590	54664		.6250	54725	
	.4070	54604		.4600	54665		.6255	54726	
	.4080	54605		.4610	54666		.6260	54727	
	.4090	54606		.4620	54667		.6270	54728	
	.4100	54607		.4630	54668		.6299	54729	
Y	.4110	54608	15/32	.4640	54669	3/4	.6310	54730	
	.4120	54609		.4650	54670		.7490	54731	
	.4130	54610		.4660	54671		.7495	54732	
	.4134	54611		.4670	54672		.7500	54733	
	.4140	54612		.4680	54673		.7505	54734	
	.4150	54613		.4688	54674		.7510	54735	

SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL	SIZE RANGE	FLUTE LENGTH	OAL
.0280"-.0415"	1/4	1-1/2	.0815"-.0965"	1/2	2	.1610"-.1915"	7/8	2-3/4	.3170"-.4160"	1-1/4	3-1/2
.0420"-.0650"	3/8	1-1/2	.0970"-.1300"	5/8	2-1/4	.1920"-.2555"	1	3	.4170"-.4780"	1-3/8	4
.0655"-.0810"	1/2	1-3/4	.1305"-.1605"	3/4	2-1/2	.2559"-.3165"	1-1/8	3-1/4	.4790"-.5625"	1-1/2	4
									.5905"-.7510"	1-3/4	4

# Hand Reamers

**High Speed Steel  
Right Hand Cut**

Used for hand reaming for final sizing and finishing of holes. Ground with a starting taper for easy entry into the hole. Shanks are the same size as the reamer size and are supplied with a square end for holding in a tap wrench or vise.

**Diameter Tolerances**

up to 1/2" — +.0002/-0  
 over 1/2" to 5/8" — +.0003/-0  
 over 5/8" to 1 1/2" — +.0001/+0.0004

**List No. 1601 Straight Flute**

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/8	.1250	1 1/2	3	4	21231
5/32	.1562	1 5/8	3 1/4	6	21232
3/16	.1875	1 3/4	3 1/2	6	21233
7/32	.2188	1 7/8	3 3/4	6	21234
1/4	.2500	2	4	6	21235
9/32	.2812	2 1/8	4 1/4	6	21236
5/16	.3125	2 1/4	4 1/2	6	21237
11/32	.3438	2 3/8	4 3/4	6	21238
3/8	.3750	2 1/2	5	6	21239
13/32	.4062	2 5/8	5 1/4	6	21240
7/16	.4375	2 3/4	5 1/2	6	21241
15/32	.4688	2 7/8	5 3/4	6	21242
1/2	.5000	3	6	6	21243
17/32	.5312	3 1/8	6 1/4	6	21244
9/16	.5625	3 1/4	6 1/2	8	21245
19/32	.5938	3 3/8	6 3/4	8	21246
5/8	.6250	3 1/2	7	8	21247
21/32	.6562	3 11/16	7 3/8	8	21248
11/16	.6875	3 3/8	7 3/4	8	21249
23/32	.7188	4 1/16	8 1/8	8	21250
3/4	.7500	4 3/16	8 3/8	8	21251
7/8	.8750	4 7/8	9 3/4	8	21252
1	1.0000	5 7/16	10 7/8	8	21253
1 1/8	1.1250	5 13/16	11 5/8	10	21254
1 1/4	1.2500	6 1/8	12 1/4	10	21255
1 3/8	1.3750	6 5/16	12 5/8	10	21256
1 1/2	1.5000	6 1/2	13	10	21257

# Bridge Reamers

**High Speed Steel — Morse Taper Shank  
Right Hand Cut**

Commonly used on bridgework, ship construction and structural steel fabrication where extreme accuracy of diameter is not important. May be used in portable electric or pneumatic equipment.

SIZE	MORSE TAPER NO.	DEC. EQUIV.	FLUTE LENGTH	OAL	APPROX. POINT DIA.	NO. 1697 EDP NO.	NO. 1701 EDP NO.
7/16	2	.4375	4 3/8	8 1/4	1/4	—	22721
1/2	2	.5000	5 1/8	9	9/32	—	22722
9/16	2	.5625	5 1/8	9	11/32	22672	22723
5/8	2	.6250	6 1/8	10	3/8	—	22724
11/16	3	.6875	7 1/8	11 1/4	25/64	22673	22725
3/4	3	.7500	7 3/8	12	7/16	—	22726
13/16	3	.8125	7 3/8	12	1/2	22674	22727
7/8	3	.8750	7 3/8	12	9/16	—	22728
15/16	3	.9375	7 3/8	12	5/8	22675	22729
1	3	1.0000	7 3/8	12	11/16	—	22730
1 1/16	3	1.0625	7 3/8	12	3/4	22676	22731
1 1/8	3	1.1250	7 3/8	12	13/16	—	22732
1 3/16	3	1.1875	7 3/8	12	7/8	—	22733
1 1/4	4	1.2500	7 3/8	13	15/16	—	22734
1 5/16	4	1.3125	7 3/8	13	1	—	22735

Alésoir à main

Rima de mano



**List No. 1601 Straight Flute**

**Straight Flute** for most applications



**List No. 1602 Left Hand Helical Flute**

**Left Hand Helical Flute** pushes chips out ahead of the reamer in through holes and bridges interruptions in the hole being reamed.

**STANDARD PACKAGE** All sizes —1 each

**List No. 1602 Helical Flute**

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/4	.2500	2	4	6	21291
9/32	.2812	2 1/8	4 1/4	6	21292*
5/16	.3125	2 1/4	4 1/2	6	21293
3/8	.3750	2 1/2	5	6	21295
13/32	.4062	2 5/8	5 1/4	6	21296*
7/16	.4375	2 3/4	5 1/2	6	21297
1/2	.5000	3	6	6	21299
9/16	.5625	3 1/4	6 1/2	8	21300
5/8	.6250	3 1/2	7	8	21301
11/16	.6875	3 3/8	7 3/4	8	21302
3/4	.7500	4 3/16	8 3/8	8	21303
13/16	.8125	4 9/16	9 1/8	8	21304
7/8	.8750	4 7/8	9 3/4	8	21305
15/16	.9375	5 1/8	10 1/4	8	21306
1	1.0000	5 7/16	10 7/8	8	21307
1 1/8	1.1250	5 13/16	11 5/8	10	21308
1 1/4	1.2500	6 1/8	12 1/4	10	21309
1 3/8	1.3750	6 5/16	12 5/8	10	21310
1 1/2	1.5000	6 1/2	13	10	21311

\* Available While Supplies Last

Alésoir de chaudronnerie

Rima estructural



**List No. 1697 Straight Flute**



**List No. 1701 Left Hand Helical Flute**

**Left Hand Helical Flute** cuts with a shearing action for smoother cutting and improved hole quality, eliminates grabbing and binding of the reamer in the hole and pushes chips ahead of the reamer.

**STANDARD PACKAGE** All sizes —1 each

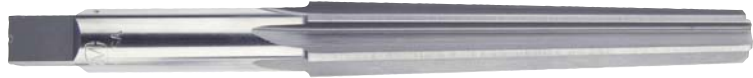
# Morse Taper Finishing Reamers

High Speed Steel — Straight Shank  
Straight Flute — Right Hand Cut

For accurate hand reaming of Morse Taper holes in sockets, sleeves and spindles.

Alésoir conique

Rima conica



List No. 1636 - Straight Shank

STANDARD PACKAGE All sizes — 1 each

DIA. OF REAMER		MORSE TAPER NO.	FLUTE LENGTH	OAL	SHANK DIA.	EDP NO.
LARGE END	SMALL END					
.3674	.2503	0	2¼	3¾	5/16	21491
.5170	.3674	1	3	5	7/16	21492
.7444	.5696	2	3½	6	9/8	21493
.9881	.7748	3	4¼	7¼	7/8	21494
1.2893	1.0167	4	5¼	8½	1½	21495
1.8005	1.4717	5	6¼	9¾	1½	21496

# Construction Taper Reamers

High Speed Steel - Straight Shank  
Left Hand Helical Flute - Right Hand Cut

Construction reamers are especially adapted for heavy duty reaming in structural steel assemblies. They are tapered at the point to enter holes which are out of alignment.

Straight shank with stop collar to prevent the reamer from running through the hole.

Alésoir de construction

Rima de construcción



List No. 1650 — 3-Flat Shank

Round shank with 3 flats to prevent slipping in the drill chuck



List No. 1650R — Round Shank

STANDARD PACKAGE All sizes — 1 each

List No. 1650 — 3-Flat Shank

SIZE	DEC. EQUIV.	SHANK DIA.	POINT DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/8	.3750	3/8	.1645	3%	5¼	5	21000
7/16	.4375	7/16	.1645	3%	5¼	5	21001
1/2	.5000	1/2	.2340	4%	6	5	21002
9/16	.5625	1/2	.2920	5	6½	5	21003
5/8	.6250	1/2	.3520	5	6½	5	21004
1¼	.6875	1/2	.4140	5%	7	5	21005
¾	.7500	1/2	.4770	5%	7	5	21006
1¾	.8125	1/2	.5400	5%	7¼	5	21009
7/8	.8750	1/2	.6020	5%	7¼	5	21007
15/16	.9375	1/2	.6450	5%	7¼	5	21010
1	1.0000	1/2	.7270	5%	7¼	5	21008

List No. 1650R — Round Shank

SIZE	DEC. EQUIV.	SHANK DIA.	POINT DIA.	FLUTE LENGTH	OAL	NO. OF FLUTES	EDP NO.
3/8	.3750	3/8	.1645	3%	5¼	5	21100
7/16	.4375	7/16	.1645	3%	5¼	5	21101
1/2	.5000	1/2	.2340	4%	6	5	21102
9/16	.5625	1/2	.2920	5	6½	5	21103
5/8	.6250	1/2	.3520	5	6½	5	21104
1¼	.6875	1/2	.4140	5%	7	5	21105
¾	.7500	1/2	.4770	5%	7	5	21106
1¾	.8125	1/2	.5400	5%	7¼	5	21109
7/8	.8750	1/2	.6020	5%	7¼	5	21107
15/16	.9375	1/2	.6450	5%	7¼	5	21110
1	1.0000	1/2	.7270	5%	7¼	5	21108

# Taper Pin Reamers

High Speed Steel – Straight Shank

Right Hand Cut

1/4" Taper Per Foot

For reaming holes for standard taper pins. **Straight Flute** for hand reaming of most materials. **Helical Flute** for machine reaming of most materials. **Spiral Flute** for hand reaming of difficult-to-ream materials.

**STANDARD PACKAGE** All sizes —1 each

Alésoir conique à goupilles

Rima para agujeros cónicos



List No. 1680 Straight Flute Hand Reamers



List No. 1683 Helical Flute Machine Reamers  
Left Hand Helix



List No. 1684 Spiral Flute Hand Reamers  
Left Hand Helix

SIZE	SHANK DIA.	DIA. SMALL END	DIA. LARGE END	FLUTE LENGTH	OAL	1680 EDP NO.	NO. OF FLUTES	1683 EDP NO.	NO. OF FLUTES	1684 EDP NO.	NO. OF FLUTES
7/0	5/64	.0497	.0666	13/16	113/16	22581	4	22611	2	22641	4
6/0	3/32	.0611	.0806	15/16	115/16	22582	4	22612	2	22642	4
5/0	7/64	.0719	.0966	13/16	23/16	22583	4	22613	2	22643	4
4/0	1/8	.0869	.1142	15/16	25/16	22584	4	22614	3	22644	4
3/0	9/64	.1029	.1302	15/16	25/16	22585	4	22615	3	22645	4
2/0	5/32	.1137	.1462	19/16	29/16	22586	4	22616	3	22646	4
0	11/64	.1287	.1638	111/16	215/16	22587	4	22617	3	22647	4
1	3/16	.1447	.1798	111/16	215/16	22588	6	22618	3	22648	6
2	13/64	.1605	.2008	115/16	33/16	22589	6	22619	3	22649	6
3	15/64	.1813	.2294	25/16	311/16	22590	6	22620	3	22650	6
4	17/64	.2071	.2604	29/16	41/16	22591	6	22621	3	22651	6
5	5/16	.2409	.2994	213/16	45/16	22592	6	22622	3	22652	6
6	23/64	.2773	.3540	311/16	57/16	22593	6	22623	3	22653	6
7	13/32	.3297	.4220	47/16	65/16	22594	6	22624	3	22654	6
8	7/16	.3971	.5050	53/16	73/16	22595	6	22625	3	22655	6
9	9/16	.4805	.6066	61/16	85/16	22596	6	22626	4	22656	6
10	5/8	.5799	.7219	613/16	95/16	22597	6	22627	4	22657	6

# Taper Pipe Reamers

High Speed Steel — Right Hand Cut

Left Hand Helical Flute

3/4" Taper per foot. For reaming holes to be tapped with American Standard taper pipe taps.

Fraise à tuyau

Rima de tubería



List No. 2116

**STANDARD PACKAGE** All sizes —1 each

SIZE	DIA. LARGE END	DIA. SMALL END	SHANK DIA.	FLUTE LENGTH	OAL	EDP NO.
1/8	.362	.316	.4375	3/4	21/8	36081
1/4	.472	.406	.5625	11/16	27/16	36082
3/8	.606	.540	.7000	11/16	29/16	36083
1/2	.751	.665	.8875	13/8	31/8	36084
3/4	.962	.876	1.1250	13/8	33/8	36085
1	1.212	1.103	1.2500	13/4	33/4	36086
1 1/4	1.553	1.444	1.3125	13/4	4	36087
1 1/2	1.793	1.684	1.5000	13/4	4 1/4	36088
2	2.268	2.159	1.8750	13/4	4 1/2	36089

## CARBIDE BURRS

## PAGE NO.

1/8" Shank . . . . .	111-112
1/8" Shank — 1/4" Diameter . . . . .	111
1/4" Shank — Standard Sizes & Shapes . . . . .	108-110
1/4" x 6" Long Shank . . . . .	111
Non-Ferrous . . . . .	110
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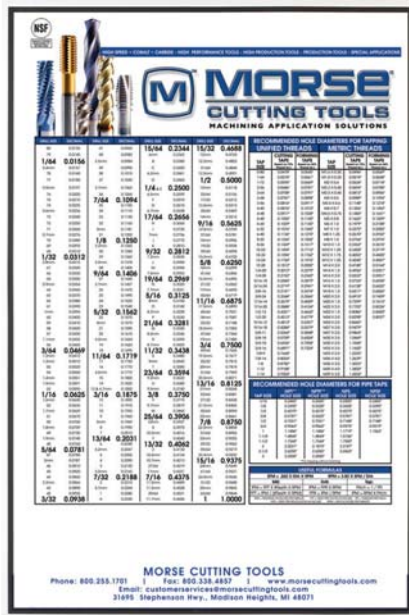
## TECHNICAL DATA

Application Data . . . . .	113
Cutting Speeds . . . . .	113

## Morse® Plastic Wall Chart

Tableau mural

Tabla mural



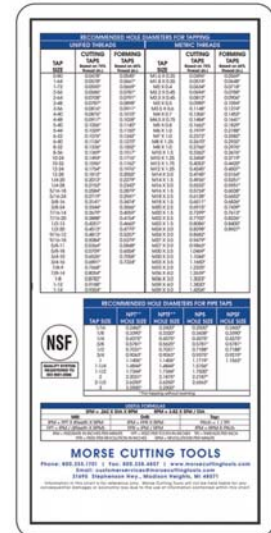
NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650

## Decimal Equivalent Pocket Chart List No. 1005

Tableau décimal

Tabla de medidas decimales



Front

Back

NEW LOOK! LARGER SIZE! Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. Size: 3 3/8" x 7", Printed on plastic

Pack of 50 EDP No. 20412

Pack of 100 EDP No. 20413

# Carbide Burrs

## 1/4" Shank

### Single Cut

General Purpose—Recommended for steel, cast iron, ferrous materials. Offers good stock removal and smooth workpiece finish.

### Double Cut

For rapid stock removal in tough applications. Design reduces the pulling action, reduces size of chips, ensures rapid stock removal.

### Cylinder Shape No End Cut



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SNGL. CUT	DBL. CUT
1/8	SA-11	1/2	59715	59500
1/8	SA-12	5/8	59816	59501
5/32	SA-13	5/8	59817	59502
3/16	SA-14	5/8	59818	59503
1/4	SA-1	5/8	59716	59504
1/4	SA-1L	1	59717	59505
5/16	SA-2	3/4	59718	59506
3/8	SA-3	3/4	59719	59507
3/8	SA-3L	1	59720	59508
3/8	SA-3X	1 1/2	59819	59509
7/16	SA-4	1	59820	59510
1/2	SA-5	1	59721	59511
5/8	SA-6	1	59722	59512
3/4	SA-15	1/2	59821	59513
3/4	SA-16	3/4	59723	59516
3/4	SA-7	1	59822	59517
7/8	SA-8	1	59823	59518
1	SA-9	1	59824	59519

### Cylinder Shape End Cut



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SNGL. CUT	DBL. CUT
1/8	SB-11	1/2	59825	59875
1/8	SB-12	5/8	59826	59876
5/32	SB-13	5/8	59827	59877
3/16	SB-14	5/8	59828	59878
1/4	SB-1	5/8	59829	59879
1/4	SB-1L	1	59830	59880
5/16	SB-2	3/4	59831	59881
3/8	SB-3	3/4	59832	59882
3/8	SB-3L	1	59833	59883
3/8	SB-3X	1 1/2	59834	59884
7/16	SB-4	1	59835	59885
1/2	SB-5	1	59836	59886
5/8	SB-6	1	59837	59887
3/4	SB-15	1/2	59838	59888
3/4	SB-16	3/4	59839	59889
3/4	SB-7	1	59840	59890
7/8	SB-8	1	59841	59891
1	SB-9	1	59842	59892

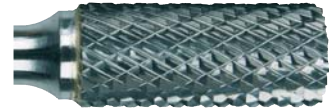
Fraise rotative au carbure

Rebabeador de carburo

List No. 5970  
Single Cut



List No. 5970  
Double Cut



STANDARD PACKAGE All sizes — 1 each

### Cylinder Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SNGL. CUT	DBL. CUT
1/8	SC-11	1/2	59724	59536
1/8	SC-12	5/8	59843	59537
5/32	SC-13	5/8	59844	59538
3/16	SC-14	5/8	59845	59539
1/4	SC-1	5/8	59846	59540
1/4	SC-1L	1	59725	59541
5/16	SC-2	3/4	59726	59542
3/8	SC-3	3/4	59847	59543
3/8	SC-3L	1	59727	59544
3/8	SC-3X	1 1/2	59848	59545
7/16	SC-4	1	59849	59546
1/2	SC-5	1	59728	59547
5/8	SC-6	1	59729	59548
3/4	SC-15	1/2	59850	59550
3/4	SC-16	3/4	59730	59549
3/4	SC-7	1	59851	59551
1	SC-9	1	59852	59552

### Ball Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SNGL. CUT	DBL. CUT
1/8	SD-11	3/32	59731	59554
3/16	SD-14	1/8	59732	59555
1/4	SD-1	1/4	59733	59556
5/16	SD-2	1/4	59734	59557
3/8	SD-3	5/16	59735	59558
7/16	SD-4	3/8	59853	59559
1/2	SD-5	7/16	59736	59560
5/8	SD-6	9/16	59737	59561
3/4	SD-7	1 1/16	59738	59562
1	SD-9	1 5/16	59854	59563

Tool Coatings Also Available

(continued)

# Carbide Burrs 1/4" Shank (continued)

List No. 5970

Fraise rotative au carbure

Rebabeador de carburo

## Oval Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
3/16	SE-11	5/16	59739	59564
1/4	SE-1	3/8	59740	59565
3/8	SE-3	3/4	59741	59566
1/2	SE-5	7/8	59742	59567
5/8	SE-6	1	59743	59568
3/4	SE-7	1	59744	59569

## 60° Cone Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/4	SJ-1	3/16	59861	59793
3/8	SJ-3	5/16	59862	59794
1/2	SJ-5	7/16	59863	59795
5/8	SJ-6	9/16	59864	59796
3/4	SJ-7	1 1/16	59865	59797
1	SJ-9	1 5/16	59866	59798

## Tree Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/8	SF-11	1/2	59855	59570
1/4	SF-1	5/8	59745	59571
3/8	SF-3	3/4	59746	59572
7/16	SF-4	1	59856	59573
1/2	SF-13	3/4	59857	59575
1/2	SF-5	1	59747	59574
5/8	SF-6	1	59748	59576
3/4	SF-14	1 1/4	59749	59578
3/4	SF-15	1 1/2	59859	59579

## 90° Cone Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/4	SK-1	1/8	59867	59800
3/8	SK-3	3/16	59868	59801
1/2	SK-5	1/4	59869	59802
5/8	SK-6	5/16	59870	59803
3/4	SK-7	3/8	59871	59804
1	SK-9	1/2	59872	59805

## Tree Shape Pointed End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/4	SG-1	5/8	59750	59580
5/16	SG-2	3/4	59751	59581
3/8	SG-3	3/4	59752	59582
1/2	SG-13	3/4	59753	59583
1/2	SG-5	1	59754	59584
5/8	SG-6	1	59755	59585
3/4	SG-7	1	59756	59586
3/4	SG-15	1 1/2	59860	59587

## Taper Shape Radius End 14° Included Angle



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/4	SL-1	5/8	59757	59605
5/16	SL-2	7/8	59758	59606
3/8	SL-3	1 1/16	59759	59607
1/2	SL-4	1 1/8	59760	59608
5/8	SL-5	1 3/16	59873	59609
5/8	SL-6	1 5/16	59761	59610
3/4	SL-7	1 1/2	59762	59611

## Flame Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGL. CUT	DBL. CUT
1/4	SH-1	5/8	59774	59780
5/16	SH-2	3/4	59775	59781
1/2	SH-5	1 1/4	59776	59782
5/8	SH-6	1 7/16	59777	59783
3/4	SH-7	1 5/8	59778	59784

## Cone Shape



DIA.	TOOL NO.	INCL. ANGLE	LENGTH OF CUT	EDP NO.	
				SINGL. CUT	DBL. CUT
1/4	SM-1	22°	1/2	59763	59612
1/4	SM-2	14°	3/4	59764	59613
1/4	SM-3	10°	1	59765	59614
3/8	SM-4	28°	5/8	59766	59615
1/2	SM-5	28°	7/8	59767	59616
5/8	SM-6	31°	1	59768	59617

(continued)

BURRS

# Carbide Burrs 1/4" Shank (continued)

List No. 5970

## Inverted Cone Shape



Fraise rotative au carbure

Rebabeador de carburo

DIA.	TOOL NO.	INCL. ANGLE	LENGTH OF CUT	EDP NO.	
				SINGL. CUT	DBL. CUT
1/4	SN-1	10°	5/16	59769	59618
3/8	SN-2	13°	3/8	59770	59619
1/2	SN-4	28°	1/2	59771	59620
5/8	SN-6	18°	3/4	59772	59621
3/4	SN-7	30°	5/8	59773	59622

## Carbide Burrs For Non-Ferrous Materials

### 1/4" Shank

NF Burrs are designed for use on aluminum, non-ferrous metals, soft steel, reinforced plastics, and other soft materials. High flute design for easy chip flow and fast stock removal. Provides excellent work finish with minimum loading when cutting soft, sticky metals.

Fraise rotative au carbure

Rebabeador de carburo

### List 5970

STANDARD PACKAGE

All sizes — 1 each

## Cylinder Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
1/4	SA-1-NF	3/4	59625
3/8	SA-3-NF	3/4	59626
1/2	SA-5-NF	1	59627
5/8	SA-6-NF	1	59628
3/4	SA-7-NF	1	59629
3/4	SA-7-NF 3/8	1	59810*

## Oval Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
3/8	SE-3-NF	5/8	59640
1/2	SE-5-NF	7/8	59641
5/8	SE-6-NF	1	59642
3/4	SE-7-NF	1	59643
3/4	SE-7-NF 3/8	1	59813*

## Cylinder Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
1/4	SC-1-NF	3/4	59630
3/8	SC-3-NF	3/4	59631
1/2	SC-5-NF	1	59632
5/8	SC-6-NF	1	59633
3/4	SC-7-NF	1	59634
3/4	SC-7-NF 3/8	1	59811*

## Tree Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
1/4	SF-1-NF	3/4	59644
3/8	SF-3-NF	3/4	59645
1/2	SF-5-NF	1	59646
5/8	SF-6-NF	1	59647
3/4	SF-14-NF	1 1/4	59648
3/4	SF-14-NF 3/8	1 1/4	59814*

## Ball Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
1/4	SD-1-NF	3/16	59635
3/8	SD-3-NF	9/16	59636
1/2	SD-5-NF	7/16	59637
5/8	SD-6-NF	9/16	59638
3/4	SD-7-NF	1 1/16	59639
3/4	SD-7-NF 3/8	1 1/16	59812*

## Taper Shape Radius End 14° Included Angle



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.
3/8	SL-3-NF	1 1/16	59649
1/2	SL-4-NF	1 1/8	59650
5/8	SL-5-NF	1 3/16	59651
5/8	SL-6-NF	1 5/16	59652
3/4	SL-7-NF	1 1/2	59653
3/4	SF-7-NF 3/8	1 1/2	59815*

\*Note: Tool No. indicated with 3/8 are furnished with 3/8" shank.



# Long Shank Carbide Burrs 1/4" x 6" Long Steel Shank

Single Cut & Double Cut

Fraise rotative au carbure

Rebabeador de carburo

List 5970

STANDARD PACKAGE All sizes — 1 each

## Cylinder Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SA-1L6	1/2	59655	59925
3/8	SA-3L6	3/4	59656	59926
1/2	SA-5L6	1	59657	59927

## Tree Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SF-1L6	1/2	59667	59937
3/8	SF-3L6	3/4	59668	59938
1/2	SF-5L6	1	59669	59939

## Cylinder Shape Radius End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SC-1L6	1/2	59658	59928
3/8	SC-3L6	3/4	59659	59929
1/2	SC-5L6	1	59660	59930

## Tree Shape Pointed End



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SG-1L6	1/2	59670	59940
3/8	SG-3L6	3/4	59671	59941
1/2	SG-5L6	1	59672	59942

## Ball Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SD-1L6	3/16	59661	59931
3/8	SD-3L6	5/16	59662	59932
1/2	SD-5L6	7/16	59663	59933

## Flame Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
5/16	SH-2L6	3/4	59673	59943
1/2	SH-5L6	7/8	59674	59944

## Oval Shape



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SE-1L6	3/8	59664	59934
3/8	SE-3L6	5/8	59665	59935
1/2	SE-5L6	7/8	59666	59936

## Taper Shape Radius End — 14°



DIA.	TOOL NO.	LENGTH OF CUT	EDP NO.	
			SINGLE CUT	DOUBLE CUT
1/4	SL-1L6	3/8	59675	59945
3/8	SL-3L6	5/8	59676	59946
1/2	SL-4L6	7/8	59677	59947

# Carbide Burrs 1/4" Dia. - 1/8" Steel Shank

Single Cut

Fraise rotative au carbure

Rebabeador de carburo

List 5970

STANDARD PACKAGE All sizes — 1 each



EDP NO.	59678	59679	59680	59681	59682	59683	59684	59685	59686
TOOL NO.	SA-51	SB-51	SC-51	SD-51	SE-51	SF-51	SG-51	SM-51	SN-51
LOC	1/2	1/4	1/2	1/4	3/8	1/2	1/2	1/2	1/4

# Carbide Burrs – 1/8" Shank

Double Cut

Fraise rotative au carbure

Rebabeador de carburo

List 5970  
STANDARD  
PACKAGE

All sizes — 1 each



EDP NO.	59688	59689	59713	59690	59691	59692	59693	59694	59695	59696	59697	59698	59699	59700	59701	59702	59703	59714
TOOL NO.	SC-53	SD-53	SA-41	SA-43	SA-42	SC-42	SC-41	SD-42	SE-41	SF-41	SG-41	SJ-42	SL-41	SH-41	SN-42	SK-42	SB-41	SB-43
DIA.	3/16	3/16	1/16	1/8	3/32	1/8	3/32	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/8
L.O.C.	1/2	5/32	1/4	5/8	1/2	5/8	1/2	1/8	3/16	1/4	1/4	3/16	13/32	3/16	1/8	1/8	1/4	5/8



EDP NO.	59893	59894	59895	59896	59897	59898	59899	59900
TOOL NO.	SL-42	SD-41	SF-42	SF-53	SG-43	SG-44	SM-42	SM-43
DIA.	1/8	3/32	1/8	3/16	1/8	1/8	1/8	1/8
L.O.C.	1/2	3/32	1/2	1/2	3/8	1/2	7/16	5/8

Tool Coatings Also Available

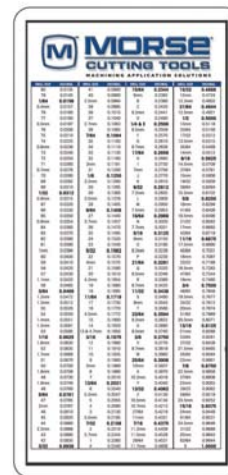
## Decimal Equivalent Pocket Chart List No. 1005

Tableau décimal      Tabla de medidas decimales

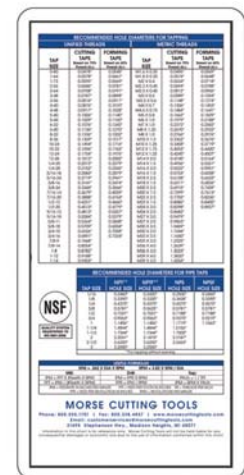
NEW LOOK! LARGER SIZE! Decimal Equivalents.  
Tap Drill Sizes for inch, metric and pipe threads.  
Size: 3 3/8" x 7", Printed on plastic

Pack of 50  
EDP No. 20412

Pack of 100  
EDP No. 20413



Front



Back

# Carbide Burr Sets — Double Cut

List 5970

Jeu de fraises rotatives au carbure

Conjunto de rebabadores de carburo



Supplied in a premium hardwood case.

EDP	SET NO.	SHANK DIA.	INCLUDES
59687	C-300	1/8	SA-51, SB-51, SC-51, SD-51, SE-51, SF-51, SG-51, SM-51, SN-51
59711	C-100	1/8	SA-43, SA-42, SC-42, SC-41, SD-42, SE-41, SF-41, SG-41, SJ-42, SL-41, SH-41, SN-42
59901	C-150	1/8	SA-42, SA-43, SC-42, SC-41, SF-42, SG-42, SM-43, SE-41, SD-42
59712	C-200	1/4	SA-1, SA-14, SC-1, SC-14, SD-1, SE-1, SF-1, SG-1, SK-1, SL-1, SH-1, SN-1
59903	C-350	1/8	SA-51, SC-51, SF-51, SG-51, SM-51, SD-51
59905	C-400	1/4	SA-1, SC-1, SF-1, SG-1, SM-2, SE-1, SL-1, SD-1
59907	C-450	1/4	SA-5, SC-5, SF-5, SG-5, SM-5, SE-5, SL-4, SD-5
59909	C-500	1/4	SA-5, SC-5, SD-5, SE-5, SG-5, SM-5, SL-4, SH-5
59911	C-550	1/4	SA-5, SC-1, SC-3, SD-3, SE-5, SH-5, SK-5, SG-1
59913	C-600	1/4	SA-1, SA-5, SC-1, SC-3, SC-5, SF-5, SL-3, SL-4
59915	C-650	1/4	SB-1, SC-3, SD-2, SE-5, SF-5, SL-4, SG-3, SM-5
59917	C-700	1/4	SA-1, SA-3, SA-5, SC-1, SC-3, SC-5, SF-1, SF-3, SF-5
59918	C-725	1/4	SA-5, SC-3, SC-5, SD-5, SF-3, SF-5, SG-3, SL-4
59919	C-750	1/4	SA-1, SA-3, SA-5, SC-1, SC-3, SC-5, SD-3, SD-5, SE-3, SF-1, SF-3, SF-5, SG-1, SG-3, SL-3, SL-4

## Carbide Burrs Application Data

STYLE OF CUT	MATERIAL			
	ALUMINUM	BRASS, COPPER	CAST IRON	PLASTICS
Single		☆	☆	
Double		☆	☆	
NF Style	☆			☆

STYLE OF CUT	MATERIAL		
	STEEL-UP TO 40-60 Rc	TITANIUM	ZINC
Single	☆	☆	
Double	☆	☆	
NF Style			☆

## RECOMMENDED CUTTING SPEEDS

BURR DIAMETER	R.P.M.
1/16	55000-85000
3/32	50000-60000
1/8	35000-65000
3/16	30000-55000
1/4	25000-50000
5/16	18000-38000
3/8	17000-38000
7/16	13000-37000
1/2	14000-36000
5/8	11000-23000
3/4	8000-19000
1	7000-18000

Increase speeds for softer non-ferrous materials.  
Decrease speeds for harder ferrous materials.



### Double Cut

Most popular style. For rapid stock removal in tough applications. Design reduces the pulling action, reduces size of chips, ensures rapid stock removal.



### Single Cut

General Purpose. Recommended for steel, cast iron, ferrous materials. Offers good stock removal and smooth workpiece finish.



### Non-Ferrous Cut

For use on aluminum, non-ferrous metals, soft steel, reinforced plastics, and other soft materials. High flute design for easy chip flow and fast stock removal. Provides excellent work finish with minimum loading when cutting soft, sticky metals.

# COUNTERBORES

# COUNTERSINKS

# CENTER DRILLS

# SPOTTING DRILLS

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# M42 8% Cobalt Zero Flute Countersink & Deburring Tools

For countersinking and deburring in a wide range of ferrous and non-ferrous materials. Radially relieved single cutting edge for fast stock removal without chatter in portable and machine applications.

**M42 8% Cobalt** offers increased wear and heat resistance in alloy steels, stainless steels and other abrasive and difficult materials. Longer tool life in all production applications.

Tools can be re-sharpened using an axial relief sharpening fixture or with a mounted grinding wheel inserted into the hole.

Fraise au cobalt

Avellanador de cobalto



List No. 1753

SIZE	DIA. OF CUT		BODY DIA.	SHANK DIA.	OAL	EDP NO.		
	MIN.	MAX.				60°	82°	90°
#0*	.09	.23	1/4	1/4	1 1/2	25600	25610	25620
#1	.15	.40	7/16	1/4	2 1/32	25601	25611	25621
#2	.19	.52	9/16	1/4	2	25602	25612	25622
#3	.28	.75	13/16	1/2	2 5/8	25603	25613	25623
#4	.46	1.08	1 1/8	1/2	2 7/8	25604	25614	25624
5-Piece Set, Sizes #0 - #4 In Plastic Case						25609	25619	25629

\*Size #0 is double end.

# Single Flute Countersinks High Speed Steel Treated (Black Oxide)

For chamfering, deburring, and countersinking. Also to enlarge existing holes in thin sheet metal.

Designed for light portable work as well as machine use. Single flute construction provides smoother surface finish. Can be used when multi-flute countersinks chatter.

**STANDARD PACKAGE** All sizes — 1 each

Fraise

Avellanador

**STANDARD PACKAGE**

All sizes — 1 each



List No. 1752

SIZE	SHANK		OAL	EDP NO.				
	DIA.	DIA.		60°	82°	90°	100°	120°
1/8	1/8	1/8	1 1/2	25567	25568	25569	25570	25639
1/4	1/4	1/4	2	25571	25572	25573	25574	25640
3/8	1/4	1/4	2	25575	25576	25577	25578	25641
1/2	1/4	1/4	2	25579	25580	25581	25582	25642
5/8	1/2	1/2	2 1/4	25583	25584	25585	25586	25643
3/4	1/2	1/2	2 3/4	25587	25588	25589	25590	25644
1	1/2	1/2	2 3/4	25591	25592	25593	25594	25645
1 1/4	1/2	1/2	3	25630	25631	25632	—	—
1 1/2	3/4	3/4	3 1/2	25633	25634	25635	—	—
2	3/4	3/4	3 3/4	25636	25637	25638	—	—

# M42 8% Cobalt Titanium Nitride (TiN) Coated Single Flute Countersinks

For chamfering, deburring, and countersinking. Also to enlarge existing holes in thin sheet metal.

Designed for light portable work as well as machine use. Single flute construction provides smoother surface finish. Can be used when multi-flute countersinks chatter.

**M42 8% Cobalt** offers increased wear and heat resistance in alloy steels, stainless steels and other abrasive and difficult materials. Longer tool life in all production applications.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding.

Fraise au cobalt

Avellanador de cobalto



List No. 1754

**STANDARD PACKAGE**

All sizes — 1 each

SIZE	SHANK		OAL	EDP NO.		
	DIA.	DIA.		60°	82°	90°
1/8	1/8	1/8	1-1/2	25650	25658	25666
1/4	1/4	1/4	2	25651	25659	25667
3/8	1/4	1/4	2	25652	25660	25668
1/2	3/8	3/8	2	25653	25661	25669
5/8	3/8	3/8	2-1/4	25654	25662	25670
3/4	1/2	1/2	2-3/4	25655	25663	25671
1	1/2	1/2	2-3/4	25656	25664	25672
1-1/4	1/2	1/2	3	25657	25665	25673

# Carbide Single Flute Countersinks

For countersinking, chamfering, and deburring holes. Produces a smoother finish. Can be used when multi-flute countersinks chatter.

The 1/8 and 1/4 diameters are solid carbide. The larger diameters are brazed construction.

**Carbide** offers excellent wear resistance, heat resistance and rigidity. Recommended for abrasive materials, difficult-to-drill materials and increased tool life in production applications.

Fraise au carbure

Avellanador de carburo



List No. 5752

STANDARD PACKAGE All sizes — 1 each

SIZE	SHANK		EDP NO.				
	DIA.	OAL	60°	82°	90°	100°	120°
1/8	1/8	1 1/2	56101	56102	56103	56119	56120
1/4	1/4	2	56104	56105	56106	56121	56122
3/8	1/4	2 1/2	56107	56108	56109	56123	56124
1/2	1/4	2 1/2	56110	56111	56112	56125	56126
3/4	3/8	3	56113	56114	56115	56127	56128
1	1/2	3	56116	56117	56118	56129	56130
1 1/4	3/4	3 1/2	56386	56387	56388	56389	56390
1 1/2	3/4	3 1/2	56391	56392	56393	56394	56395

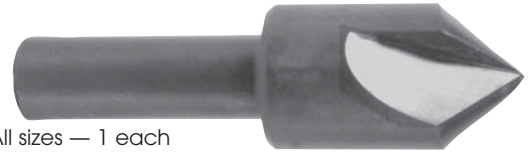
# Center Reamers

High Speed Steel - 3-Flute Treated (Black Oxide)

Designed for countersinking holes for rivets, flat head screws and centers.

Fraise conique une taille à centrer

Escariador para centrar



List No. 1750

STANDARD PACKAGE All sizes — 1 each

SIZE	SHANK		EDP NO.			
	DIA.	OAL	60°	82°	90°	100°
1/4	1/4	2	23501	23502	23503	23504
3/8	1/4	2	23505	23506	23507	23508
1/2	3/8	2	23509	23510	23511	23512
5/8	3/8	2 1/4	23513	23514	23515	23516
3/4	1/2	2 3/4	23517	23518	23519	23520
1	1/2	2 3/4	23521	23522	23523	—

# Carbide Three Flute Countersinks

For countersinking, chamfering, and deburring holes.

Three flutes allow higher feed rates than single flute countersinks and greater chip clearance than six flute countersinks.

The 1/8 and 1/4 diameters are solid carbide. The larger diameters are brazed construction.

**Carbide** offers excellent wear resistance, heat resistance and rigidity. Recommended for abrasive materials, difficult-to-drill materials and increased tool life in production applications.

STANDARD PACKAGE All sizes — 1 each

Fraise au carbure

Avellanador de carburo



List No. 5753

SIZE	SHANK		EDP NO.				
	DIA.	OAL	60°	82°	90°	100°	120°
1/8	1/8	1 1/2	56163	56171	56179	56187	56193
1/4	1/4	2	56164	56172	56180	56188	56194
3/8	1/4	2 1/2	56165	56173	56181	56189	56195
1/2	1/4	2 1/2	56166	56174	56182	56190	56196
3/4	3/8	3	56167	56175	56183	56191	56197
1	1/2	3	56168	56176	56184	56192	56198
1 1/4	3/4	3 1/2	56169	56177	56185	—	—
1 1/2	3/4	3 1/2	56170	56178	56186	—	—

# Machine Countersinks

High Speed Steel - 4-Flute Treated (Black Oxide)

Designed primarily for countersinking holes. The longer shank length is ideal for use in turret lathes for screw machine work.

STANDARD PACKAGE All sizes — 1 each

Fraise

Avellanador



List No. 1751

SIZE	SHANK DIA.	SHANK LENGTH	OAL	EDP NO.		
				60°	82°	90°
1/2	1/2	2 1/4	3 3/8	25551	25552	25561
5/8	1/2	2 1/4	4	25553	25554	—
3/4	1/2	2 1/4	4 1/4	25555	25556	25563
7/8	1/2	2 1/4	4 1/4	25557	25558	—
1	1/2	2 1/4	4 3/8	25559	25560	25565

# Carbide Four Flute Countersinks

STANDARD  
PACKAGE  
All sizes — 1 each

For countersinking, chamfering, and deburring holes.

Four flutes allow higher feed rates than single flute countersinks and greater chip clearance than six flute countersinks.

The 1/8 and 1/4 diameters are solid carbide. The larger diameters are brazed construction.

**Carbide** offers excellent wear resistance, heat resistance and rigidity. Recommended for abrasive materials, difficult-to-drill materials and increased tool life in production applications.

Fraise au carbure

Avellanador de carburo



List No. 5755

SIZE	SHANK			EDP NO.				
	DIA.	OAL		60°	82°	90°	100°	120°
1/8	1/8	1-1/2		56628	56635	56642	56649	56656
1/4	1/4	2		56629	56636	56643	56650	56657
3/8	1/4	2-1/2		56630	56637	56644	56651	56658
1/2	3/8	2-1/2		56631	56638	56645	56652	56659
5/8	3/8	2-1/2		56632	56639	56646	56653	56660
3/4	1/2	3		56633	56640	56647	56654	56661
1	1/2	3		56634	56641	56648	56655	56662

# M42 8% Cobalt Titanium Nitride (TiN) Coated Six Flute Chatterless Countersinks

Cutting edge geometry designed to reduce chatter and harmonics. Six flutes allow higher feed rates and provide longer tool life due to distributing the cutting load over a greater number of teeth.

**M42 8% Cobalt** offers increased wear and heat resistance in alloy steels, stainless steels and other abrasive and difficult materials. Longer tool life in all production applications.

**Titanium Nitride (TiN) Coating** increases tool surface hardness, wear resistance, heat resistance, chip flow and resists chip welding.

Fraise au cobalt

Avellanador de cobalto



List No. 1755

STANDARD  
PACKAGE All sizes — 1 each

SIZE	SHANK			EDP NO.		
	DIA.	OAL		60°	82°	90°
1/4	1/4	2		25680	25687	25694
3/8	1/4	2		25681	25688	25695
1/2	3/8	2		25682	25689	25696
5/8	3/8	2-1/4		25683	25690	25697
3/4	1/2	2-3/4		25684	25691	25698
1	1/2	2-3/4		25685	25692	25699
1-1/4	1/2	3		25686	25693	25700

# Carbide Six Flute Chatterless Countersinks

Cutting edge geometry designed to reduce chatter and harmonics. Six flutes allow higher feed rates and provide longer tool life due to distributing the cutting load over a greater number of teeth.

The 1/4 diameter is solid carbide. The larger diameters are brazed construction.

Fraise au carbure

Avellanador de carburo



List No. 5754

STANDARD  
PACKAGE All sizes — 1 each

Carbide offers excellent wear resistance, heat resistance and rigidity. Recommended for abrasive materials, difficult-to-drill materials and increased tool life in production applications.

SIZE	SHANK			EDP NO.				
	DIA.	OAL		60°	82°	90°	100°	120°
1/8	1/8	1-1/2		56096	56097	56098	56099	56100
1/4	1/4	2		56132	56139	56146	56153	56158
3/8	1/4	2-1/2		56133	56140	56147	56154	56159
1/2	1/4	2-1/2		56134	56141	56148	56155	56160
3/4	3/8	3		56135	56142	56149	56156	56161
1	1/2	3		56136	56143	56150	56157	56162
1-1/4	3/4	3-1/2		56137	56144	56151	—	—
1-1/2	3/4	3-1/2		56138	56145	56152	—	—

# Combined Drills and Countersinks

High Speed Steel — Bright Finish  
60° Included Angle

Often called “center drills”, Designed for drilling center holes in the ends of work pieces to be held between standard 60° centers. **Bell Type** features an additional 120° chamfer at the body diameter to form a protected 60° center hole.

STANDARD PACKAGE	Plain Type & Bell Type	Long Plain Type
	All Sizes — 6 each	1 thru 3 — 6 each 4 thru 8 — 1 each

## List No. 1495 Plain Type

SIZE	DRILL DIA.	BODY DIA.	OAL	EDP NO.
000	.020	1/8	1 1/4	25049
00	.025	1/8	1 1/4	25050
0	1/32	1/8	1 1/4	25051
1	3/64	1/8	1 1/4	25041
2	5/64	3/16	1 7/8	25042
3	7/64	1/4	2	25043
4	1/8	5/16	2 1/8	25044
4 1/2	9/64	3/8	2 1/2	25052
5	3/16	7/16	2 3/4	25045
6	7/32	1/2	3	25046
7	1/4	5/8	3 1/4	25047
8	5/16	3/4	3 1/2	25048

## List No. 1499 Long Plain Type

SIZE	DRILL DIA.	BODY DIA.	OAL	EDP NO.
1	3/64	1/8	3	25010
1	3/64	1/8	4	25011
1	3/64	1/8	5	25036
1	3/64	1/8	6	25037
2	5/64	3/16	3	25027
2	5/64	3/16	4	25012
2	5/64	3/16	5	25013
2	5/64	3/16	6	25028
3	7/64	1/4	3	25029
3	7/64	1/4	4	25014
3	7/64	1/4	5	25015
3	7/64	1/4	6	25030
4	1/8	5/16	4	25016
4	1/8	5/16	5	25017
4	1/8	5/16	6	25018
4 1/2	9/64	3/8	4	25032
4 1/2	9/64	3/8	5	25033
4 1/2	9/64	3/8	6	25034
5	3/16	7/16	4	25035
5	3/16	7/16	5	25019
5	3/16	7/16	6	25020
6	7/32	1/2	5	25021
6	7/32	1/2	6	25022
7	1/4	5/8	6	25023
8	5/16	3/4	6	25024

Foret-fraise      Combinación de broca y avellanador



List No. 1495 Plain Type



List No. 1498 Bell Type



List No. 1499 Long Plain Type

## List No. 1498 Bell Type

SIZE	DRILL DIA.	BODY DIA.	OAL	EDP NO.
11	3/64	1/8	1 1/4	25081
12	1/16	3/16	1 7/8	25082
13	3/32	1/4	2	25083
14	7/64	5/16	2 1/8	25084
15	5/32	7/16	2 3/4	25085
16	3/16	1/2	3	25086
17	7/32	5/8	3 1/4	25087
18	1/4	3/4	3 1/2	25088

Tool Coatings Also Available

Foret-fraise      Combinación de broca y avellanador

# Combined Drill and Countersink Set

High Speed Steel

Includes Nos. 1, 2, 3, 4, and 5, Style 1495, Plain Type



List No. 8500

SIZE RANGE	SET NO.	EDP NO.
1-5	51H	25059



# Solid Carbide Combined Drills and Countersinks

Foret-fraise au carbure

Combinación de broca y avellanador de carburo

## Plain Type

### 60°, 82° & 90° Included Angle

**Solid Carbide** offers excellent wear resistance, heat resistance and rigidity. Recommended for abrasive materials, difficult-to-drill materials and increased tool life in production applications.

**ALTiN – Aluminum Titanium Nitride** Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.



Standard Length



Long Length

List No. 5495 Uncoated

List No. 5495T ALTiN Coated

STANDARD  
PACKAGE

All sizes — 1 each

### Standard Length

SIZE	DRILL DIA.	BODY DIA.	OAL	60° INCL. ANGLE		82° INCL. ANGLE		90° INCL. ANGLE	
				UNCOATED	ALTiN	UNCOATED	ALTiN	UNCOATED	ALTiN
				EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.
00	.025	1/8	1-1/2	53899	93056	53909	93066	53919	93076
0	1/32	1/8	1-1/2	53900	93057	53910	93067	53920	93077
1	3/64	1/8	1-1/2	53901	93058	53911	93068	53921	93078
2	5/64	3/16	1-7/8	53902	93059	53912	93069	53922	93079
3	7/64	1/4	2	53903	93060	53913	93070	53923	93080
4	1/8	5/16	2-1/8	53904	93061	53914	93071	53924	93081
5	3/16	7/16	2-3/4	53905	93062	53915	93072	53925	93082
6	7/32	1/2	3	53906	93063	53916	93073	53926	93083
7	1/4	5/8	3-1/4	53907	93064	53917	93074	53927	93084
8	5/16	3/4	3-1/2	53908	93065	53918	93075	53928	93085

### Long Length

SIZE	DRILL DIA.	BODY DIA.	OAL	60° INCL. ANGLE		82° INCL. ANGLE		90° INCL. ANGLE	
				UNCOATED	ALTiN	UNCOATED	ALTiN	UNCOATED	ALTiN
				EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.
1	3/64	1/8	4	53929	93086	53883	93094	53891	93102
2	5/64	3/16	4	53930	93087	53884	93095	53892	93103
3	7/64	1/4	4	53931	93088	53885	93096	53893	93104
4	1/8	5/16	4	53932	93089	53886	93097	53894	93105
5	3/16	7/16	6	53933	93090	53887	93098	53895	93106
6	7/32	1/2	6	53934	93091	53888	93099	53896	93107
7	1/4	5/8	6	53935	93092	53889	93100	53897	93108
8	5/16	3/4	6	53936	93093	53890	93101	53898	93109

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

## Center Drills

High Speed Steel — Bright Finish  
118° Point

Feature short flute length, short overall length and no body clearance. Can be chucked close to the point for maximum rigidity in centering and spotting applications

Foret à centrer

Broca para centrar



List No. 1443

STANDARD 1/16" thru 3/8" — 6 each  
PACKAGE 1/2" — 1" — 1 each

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
9/64	.1406	13/16	1 1/4	10280*
1 1/64	.1719	1	1 1/2	10282*
1 3/64	.2031	1	1 1/2	10284*

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	EDP NO.
3/8	.3750	1	2	16001
1/2	.5000	1	2	16002
5/8	.6250	1 1/8	2 1/4	16003
3/4	.7500	1 1/8	2 1/4	16004
1	1.0000	1 1/4	2 1/2	16005

\*Available While Supplies Last

## NC Spotting Drills

High Speed Steel — Bright Finish  
90° and 120° Points

Ideal for close tolerance NC spotting operations. Provides a more accurate and faster spotting location for follow-up drilling. Eliminates wandering.

Foret à pointer

Broca de puntear



List No. 1441

STANDARD 1/4" & 3/8" — 6 each  
PACKAGE 1/2" — 1" — 1 each

### Short Length

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	90° EDP NO.	120° EDP NO.
1/4	.2500	1	2 1/2	11900	11906
3/8	.3750	1 1/8	3 1/8	11901	11907
1/2	.5000	1 1/2	3 3/4	11902	11908
5/8	.6250	1 5/8	4 1/4	11903	11909
3/4	.7500	1 3/4	5	11904	11910
1	1.0000	1 3/4	6	11905	11911

### Regular Length

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	90° EDP NO.	120° EDP NO.
1/4	.2500	1	4	11912	11918
3/8	.3750	1 1/8	5	11913	11919
1/2	.5000	1 1/2	6	11914	11920
5/8	.6250	1 5/8	7 1/8	11915	11921
3/4	.7500	1 3/4	8	11916	11922
1	1.0000	1 3/4	8	11917	11923

## M42 8% Cobalt NC Spotting Drills

82°, 90° and 120° Points

Ideal for close tolerance NC spotting operations. Provides a more accurate and faster spotting location for follow-up drilling. Eliminates wandering.

Cobalt steel offers increased hardness, toughness, wear resistance and heat resistance. Recommended for drilling tough, high tensile strength materials and materials that generate higher cutting temperatures.

Tool Coatings  
Also Available

Foret à pointer

Broca de puntear



List No. 1441C

STANDARD All sizes — 1 each  
PACKAGE

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	82° EDP NO.	90° EDP NO.	120° EDP NO.
1/4	.2500	7/8	2-5/8	11936	11941	11946
3/8	.3750	1	3-1/2	11937	11942	11947
1/2	.5000	1-3/8	4	11938	11943	11948
5/8	.6250	1-3/8	4-1/2	11939	11944	11949
3/4	.7500	1-1/2	5-3/16	11940	11945	11950

# Solid Carbide NC Spotting Drills

Micrograin Carbide  
90°, 120° & 140° Points

Ideal for close tolerance NC spotting operations. Provides a more accurate and faster spotting location for follow-up drilling. Eliminates wandering.

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance, and long tool life.

**ALTiN – Aluminum Titanium Nitride** Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

Foret à pointer

Broca de puntear



List No. 1440 Uncoated



List No. 1440T ALTiN Coated

### TOLERANCES

Dia. +.0000 - .0005  
Shank Dia. +.0000 - .0005

SIZE	DEC. EQUIV.	FLUTE LENGTH	OAL	UNCOATED LIST NO. 1440			ALTiN COATED LIST NO. 1440T		
				90° EDP NO.	120° EDP NO.	140° EDP NO.	90° EDP NO.	120° EDP NO.	140° EDP NO.
1/8	.1250	5/8	2	54767	54773	54779	92947	92953	92959
3/16	.1875	3/4	2	54768	54774	54780	92948	92954	92960
1/4	.2500	3/4	2-1/2	54769	54775	54781	92949	92955	92961
5/16	.3125	1	2-1/2	54770	54776	54782	92950	92956	92962
3/8	.3750	1	2-1/2	54771	54777	54783	92951	92957	92963
1/2	.5000	1-1/4	3	54772	54778	54784	92952	92958	92964

## TOOL COATINGS

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish.

### TiN – Titanium Nitride

A good general purpose coating for a wide range of ferrous materials. Not recommended for non-ferrous materials. Has higher heat resistance than TiCN coating.

### TiCN – Titanium Carbonitride

Enhanced toughness, hardness & wear resistance for aggressive speeds & feeds. Recommended for difficult-to-machine, gummy & abrasive materials where moderate cutting temperatures are generated.

### TiALN – Titanium Aluminum Nitride

### ALTiN – Aluminum Titanium Nitride

Excellent all around coatings featuring high heat resistance. Recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials that generate higher cutting temperatures. ALTiN has higher AL content for increased hardness & heat resistance.

### CrN – Chromium Nitride

### CrC – Chromium Carbide

Especially recommended for titanium and non-ferrous materials including aluminum, copper & brass. CrC has slightly higher hardness than CrN. These coatings resist adhesion of the material being machined and resist chipping and cracking.

### DLC – Diamond Like Carbon

A thin carbon based amorphous (non-crystalline) coating featuring very high hardness & low coefficient of friction. Highly recommended for non-ferrous materials including plastic, aluminum, copper & brass. Typically used on solid carbide tools.

# Cap Screw Counterbores

## High Speed Steel — Straight Shank — 4-Flute

For producing counterbored clearance holes for the heads of socket head cap screws. Recommended for a wide range of material types.

Fraise à lamer

Broca para hacer cajas



### List No. 1766

**STANDARD PACKAGE** All sizes — 1 each

CUTTER DIA.	FOR CAP SCREW SIZE	PILOT TOLERANCE	PILOT DIA.	PILOT LENGTH	CUTTER DIA. FLUTE LENGTH	SHANK DIA.	OAL	EDP NUMBER
.183	4	Standard	.1120	1/8	9/16	.1562	3/8	25718
.215	4	+1/32 Over	.1430	1/8	9/16	.1562	3/8	25719
.205	5	Standard	.1250	5/32	5/8	.1875	4 1/8	25720
.237	5	+1/32 Over	.1560	5/32	5/8	.1875	4 1/8	25721
.227	6	Standard	.1380	3/16	3/4	.2188	4 5/8	25722
.259	6	+1/32 Over	.1690	3/16	3/4	.2188	4 5/8	25723
.270	8	Standard	.1640	7/32	3/4	.2500	5	25724
.302	8	+1/32 Over	.1950	7/32	3/4	.2500	5	25725
.312	10	Standard	.1900	1/4	7/8	.2812	5 1/4	25726
.344	10	+1/32 Over	.2180	1/4	7/8	.2812	5 1/4	25727
.380	1/4	Standard	.2500	9/32	1	.3125	5 5/8	25741
.412	1/4	+1/32 Over	.2810	9/32	1	.3125	5 5/8	25728
.474	5/16	Standard	.3125	5/16	1	.3750	6 1/8	25742
.504	5/16	+1/32 Over	.3430	5/16	1	.3750	6 1/8	25729
.569	3/8	Standard	.3750	3/8	1 1/4	.5000	6 1/2	25743
.601	3/8	+1/32 Over	.4060	3/8	1 1/4	.5000	6 1/2	25730
.661	7/16	Standard	.4370	7/16	1 1/4	.5000	7	25744
.691	7/16	+1/32 Over	.4680	7/16	1 1/4	.5000	7	25731
.755	1/2	Standard	.5000	1/2	1 1/2	.5000	7 1/2	25745
.787	1/2	+1/32 Over	.5310	1/2	1 1/2	.5000	7 1/2	25732
.943	5/8	Standard	.6250	5/8	1 1/2	.6250	7 5/8	25733
.975	5/8	+1/32 Over	.6560	5/8	1 1/2	.6250	7 5/8	25734
1.131	3/4	Standard	.7500	3/4	1 5/8	.7500	7 3/4	25735
1.163	3/4	+1/32 Over	.7810	3/4	1 5/8	.7500	7 3/4	25736
1.320	7/8	Standard	.8750	7/8	1 7/8	.8750	8	25737
1.352	7/8	+1/32 Over	.9060	7/8	1 7/8	.8750	8	25738
1.508	1	Standard	1.0000	1	2	1.0000	8 1/2	25739
1.540	1	+1/32 Over	1.0310	1	2	1.0000	8 1/2	25740

### List No. 1766 — Metric

CUTTER DIA.	FOR CAP SCREW SIZE	PILOT DIA.	PILOT LENGTH	CUTTER DIA. FLUTE LENGTH	SHANK DIA.	OAL	EDP NUMBER
.2362	3mm	.1377	5/32	5/8	.1875	4 1/8	25746
.2953	4mm	.1772	7/32	3/4	.2500	5	25747
.3543	5mm	.2165	9/32	1	.3125	5 5/8	25748
.4134	6mm	.2559	5/16	1	.3750	6 1/8	25749
.5315	8mm	.3346	3/8	1 1/4	.5000	6 1/2	25750
.6496	10mm	.4134	7/16	1 1/4	.5000	7	25751
.7283	12mm	.4921	1/2	1 1/2	.5000	7 1/2	25752
.9645	16mm	.6500	5/8	1 1/2	.6250	7 5/8	25754
1.2010	20mm	.8070	7/8	1 7/8	.8750	8	25756
1.4370	24mm	.9650	1	2	1.0000	8 1/2	25758



# Interchangeable Pilot Counterbores

## Short Series — High Speed Steel

For use with interchangeable pilots (list no. 776). For general purpose counterboring and spot facing.

Fraise à lamer

Broca para hacer cajas



List No. 1772 Straight Shank

**STANDARD PACKAGE** All sizes — 1 each

CUTTER DIA.	NO. OF FLUTES	OAL	ACCEPTS PILOT SHANK DIA.	RANGE OF PILOTS DIA.	SHANK DIA.	EDP NO.
3/16	3	3	3/32	1/8-3/16	15/64	25811
7/32	3	3	3/32	1/8-7/32	15/64	25812
1/4	3	3 13/16	3/32	1/8-3/16	15/64	25813
9/32	3	3 13/16	3/32	1/8-7/32	17/64	25814
5/16	3	3 13/16	3/32	1/8-1/4	19/64	25815
11/32	3	3 13/16	3/32	1/8-9/32	5/16	25816
3/8	3	4 1/16	5/32	3/16-5/16	5/16	25817
13/32	3	4 1/16	5/32	3/16-11/32	3/8	25818
7/16	3	4 1/16	5/32	3/16-3/8	3/8	25819
15/32	3	4 5/16	3/16	1/4-13/32	7/16	25820
1/2	3	4 5/16	3/16	1/4-7/16	7/16	25821
17/32	3	4 5/16	3/16	1/4-19/32	1/2	25822
9/16	3	4 5/16	3/16	1/4-1/2	1/2	25823
19/32	3	5 1/8	3/16	1/4-17/32	1/2	25824
5/8	3	5 1/8	3/16	1/4-9/16	1/2	25825
21/32	3	5 1/8	3/16	1/4-5/8	1/2	25826
11/16	3	5 1/8	3/16	1/4-5/8	1/2	25827
23/32	3	5 3/8	1/4	5/16-21/32	1/2	25828
3/4	3	5 3/8	1/4	5/16-11/16	1/2	25829
25/32	3	5 3/8	1/4	5/16-23/32	5/8	25830
13/16	3	5 3/8	1/4	5/16-3/4	5/8	25831
7/8	3	5 3/8	1/4	5/16-13/16	3/4	25833
15/16	3	6 1/8	1/4	5/16-7/8	3/4	25835
1	3	6 3/8	5/16	3/8-15/16	3/4	25837
1 1/16	3	6 3/8	5/16	3/8-1	3/4	25838
1 1/8	3	6 3/8	5/16	3/8-1 1/16	1	25839
1 3/16	3	6 3/8	5/16	3/8-1 1/8	1	25840
1 1/4	5	6 3/8	3/8	7/16-1 3/16	1	25841
1 3/8	5	6 3/8	3/8	7/16-1 5/16	1	25842
1 1/2	5	7 7/8	3/8	7/16-1 7/16	1 1/4	25843
1 5/8	5	8 1/8	7/16	1/2-1 9/16	1 1/4	25844
1 3/4	5	8 1/8	7/16	1/2-1 11/16	1 1/4	25845
1 7/8	5	8 1/8	7/16	1/2-1 13/16	1 1/2	25846
2	5	8 3/8	1/2	9/16-1 15/16	1 1/2	25847

### TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Interchangeable Pilots For Counterbores

Carbon Steel

Fraise à lamer avec guide

Piloto de broca para hacer cajas



List No. 0776

STANDARD  
PACKAGE

All sizes — 1 each

PILOT DIA.	SHANK DIAMETER						
	3/32	5/32	3/16	1/4	5/16	3/8	7/16
	EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	26002						
5/32	26003						
3/16	26004	26009					
7/32	26005	26010					
1/4	26006	26011	26018				
9/32	26007	26012	26019				
5/16		26013	26020	26032			
11/32		26014	26021	26033			
3/8		26015	26022	26034	26050		
13/32			26023	26035			
7/16			26024	26036	26052		
15/32			26025	26037	26053		
1/2			26026	26038	26054	26072	
17/32			26027	26039	26055	26073*	
9/16			26028	26040	26056		
19/32			26029*	—			
5/8			26030	26042	26058		
21/32				26043	26059		
11/16				26044	26060	26078	
23/32					26061		
3/4				26046	26062	26080	
13/16				26047	26063	26081	26102
7/8				26048	26064	26082	26103
15/16					26065	26083	
1					26066		
1 1/16						26085	

\*Available While Supplies Last

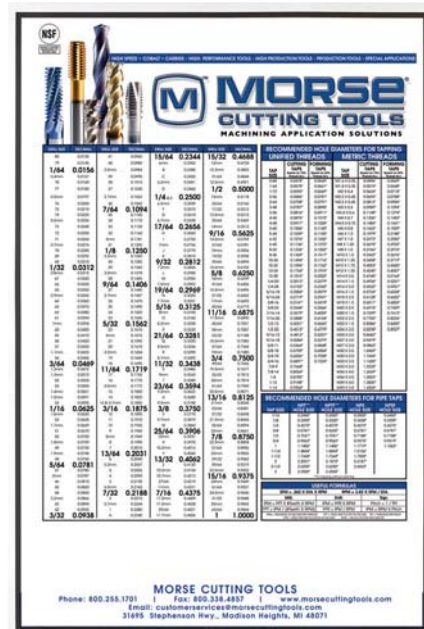
## Morse® Plastic Wall Chart

Tableau mural

Tabla mural

NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650



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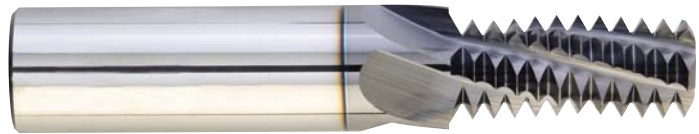
# Solid Carbide Thread Mills

ALTiN Coated  
10% Micrograin Carbide  
20° Helix Angle

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance and long tool life.

Fraise à fileter au carbure

Fresa de roscar de carburo



## List No. 5900 Fractional & Machine Screw

**ALTiN - Aluminum Titanium Nitride** is an excellent all-around coating that is especially recommended for high thermal stress applications including dry machining, abrasive materials and difficult-to-machine materials. Benefits include higher cutting speeds and longer tool life.

### THREAD MILLING FEATURES & BENEFITS

- **Reduced Tool Inventory. One Thread Mill Can Produce** internal & external threads, left hand & right hand threads, different thread diameters of the same pitch and through hole & blind hole threads.
- **Requires Less Power.** Produce coarse pitches and large diameters on lower H.P. machines.
- **Tough Threading Applications.** Thread harder, difficult-to-machine & gummy materials that cause problems for taps.
- **Helical Flutes** for reduced cutting forces, improved thread quality & increased tool life.
- **Precision Threading.** Control pitch diameter precisely via programming. Precise thread depth control & positional accuracy. Produce 100% thread heights. Produce full threads to within one pitch of a shoulder or blind hole bottom.
- **Easily Removed if Broken.** No need for EDM burn-out.

## Fractional & Machine Screw

SIZE	SHANK DIA.	CUTTING DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
6-32	1/8	.100	.218	2	3	<a href="#">98600</a>
8-36	1/8	.115	.250	2	3	<a href="#">98601</a>
8-32	1/8	.115	.250	2	3	<a href="#">98602</a>
10-24	3/16	.120	.312	2	3	<a href="#">98603</a>
10-32	3/16	.120	.312	2	3	<a href="#">98604</a>
1/4-20	3/16	.180	.500	2-1/2	3	<a href="#">98605</a>
1/4-28	3/16	.180	.500	2-1/2	3	<a href="#">98606</a>
5/16-18	1/4	.240	.625	2-1/2	3	<a href="#">98607</a>
5/16-24	1/4	.240	.625	2-1/2	3	<a href="#">98608</a>
3/8-16	5/16	.290	.750	3	4	<a href="#">98609</a>
3/8-24	5/16	.290	.750	3	4	<a href="#">98610</a>
7/16-14	3/8	.340	.875	3	4	<a href="#">98611</a>
7/16-20	3/8	.340	.875	3	4	<a href="#">98612</a>
1/2-13	3/8	.350	.875	3-1/2	4	<a href="#">98613</a>
1/2-20	3/8	.350	.875	3-1/2	4	<a href="#">98614</a>
9/16-12	1/2	.370	.875	3-1/2	4	<a href="#">98615</a>
9/16-18	1/2	.370	.875	3-1/2	4	<a href="#">98616</a>
5/8-11	1/2	.470	1.250	3-1/2	5	<a href="#">98617</a>
5/8-18	1/2	.470	1.250	3-1/2	5	<a href="#">98618</a>
3/4-10	1/2	.495	1.250	3-1/2	5	<a href="#">98619</a>
3/4-16	1/2	.495	1.250	3-1/2	5	<a href="#">98620</a>
7/8-9	5/8	.620	1.250	3-1/2	5	<a href="#">98621</a>
7/8-14	5/8	.620	1.250	3-1/2	5	<a href="#">98622</a>
1-8	3/4	.620	1.375	4	5	<a href="#">98623</a>
1-12	3/4	.620	1.375	4	5	<a href="#">98624</a>

Speeds & Feeds: Page 128



# Solid Carbide Thread Mills

ALTiN Coated  
10% Micrograin Carbide  
20° Helix Angle

Fraise à fileter au carbure

Fresa de roscar de carburo



List No. 5902 Pipe Thread

## Pipe Thread

SIZE	SHANK DIA.	CUTTING DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
<b>NPT</b>						
1/16-27	1/4	.245	.437	2-1/2	3	<a href="#">98641</a>
1/8-27	5/16	.310	.437	2-1/2	4	<a href="#">98642</a>
1/4-18	3/8	.370	.625	3	4	<a href="#">98656</a>
3/8-18	3/8	.370	.625	3	4	<a href="#">98657</a>
1/2-14	1/2	.495	.875	3-1/2	4	<a href="#">98645</a>
3/4-14	1/2	.495	.875	3-1/2	4	<a href="#">98646</a>
1-11½	3/4	.620	1.125	4	5	<a href="#">98647</a>
<b>NPTF</b>						
1/16-27	1/4	.245	.437	2-1/2	3	<a href="#">98648</a>
1/8-27	5/16	.310	.437	2-1/2	4	<a href="#">98649</a>
1/4-18	3/8	.370	.625	3	4	<a href="#">98658</a>
3/8-18	3/8	.370	.625	3	4	<a href="#">98659</a>
1/2-14	1/2	.495	.875	3-1/2	4	<a href="#">98652</a>
3/4-14	1/2	.495	.875	3-1/2	4	<a href="#">98653</a>
1-11½	3/4	.620	1.125	4	5	<a href="#">98654</a>

# Solid Carbide Thread Mills

ALTiN Coated  
10% Micrograin Carbide

Fraise à fileter au carbure

Fresa de roscar de carburo

Speeds & Feeds: Page 128

## 6 PIECE SET Fractional & Machine Screw

With just 6 thread mills you can produce 13 different thread sizes:  
6-32, 8-32, 10-32, 10-24, 5/16"-24, 3/8"-24, 1/4"-20, 1/2"-20, 5/16"-18,  
9/16"-18, 3/8"-16, 3/4"-16, 1/2"-13

With the same thread mill you can produce:

- both left hand & right hand threads
- both internal & external threads

List No. 5900

Sizes: 6-32, 10-24, 1/4"-20, 5/16"-18, 3/8"-16, 1/2"-13  
in Plastic Case

EDP No. [98655](#)

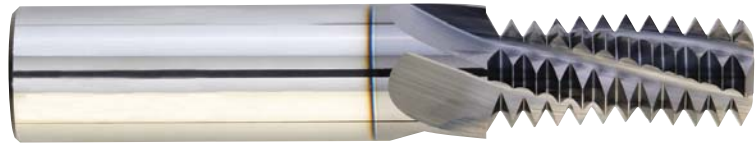


# Solid Carbide Thread Mills

Fraise à fileter au carbure

Fresa de roscar de carburo

ALTiN Coated  
10% Micrograin Carbide  
20° Helix Angle



## Metric

List No. 5901 Metric

SIZE	SHANK DIA.	CUTTING DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
M4 x 0.7	1/8	.120	.250	2	3	98625
M4.5 x 0.75	1/8	.120	.250	2	3	98626
M5 x 0.8	3/16	.120	.312	2	3	98627
M6 x 1	3/16	.170	.500	2-1/2	3	98628
M8 x 0.75	1/4	.235	.625	2-1/2	3	98629
M8 x 1	1/4	.235	.625	2-1/2	3	98630
M8 x 1.25	1/4	.235	.625	2-1/2	3	98631
M10 x 1.25	5/16	.300	.750	3	4	98632
M10 x 1.5	5/16	.300	.750	3	4	98633
M12 x 1	3/8	.360	.875	3-1/2	4	98634
M12 x 1.25	3/8	.360	.875	3-1/2	4	98635
M12 x 1.75	3/8	.360	.875	3-1/2	4	98636
M14 x 1.5	3/8	.360	.875	3-1/2	4	98637
M16 x 2	1/2	.470	1.250	3-1/2	5	98638
M18 x 2.5	1/2	.470	1.250	3-1/2	5	98639
M20 x 3	5/8	.470	1.250	3-1/2	5	98640

## Thread Milling Feed & Speeds

Material	Speed SFM	Feed Rate (inches/tooth)						
		Tool Diameter						
		1/8	3/16	1/4	5/16	3/8	1/2	5/8
Aluminum	800-1400	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007
Magnesium	800-1400	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055	.005-.007
Brass	600-800	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0045	.005-.006
Bronze	500-600	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0045	.005-.006
Hard Bronze	200-300	.0004-.0008	.0007-.0012	.001-.002	.001-.002	.0015-.0025	.002-.003	.003-.004
Low Alloy Steels < 25 Rc	350-500	.0005-.001	.001-.0015	.0015-.0025	.002-.003	.0025-.0035	.003-.004	.004-.005
High Alloy Steels > 25 Rc	250-400	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004
Stainless Steel	150-250	.0004-.0008	.0006-.001	.001-.0015	.0015-.002	.0015-.003	.002-.0035	.003-.004
Cast Iron - Soft	250-350	.0004-.0008	.0007-.0013	.0007-.0013	.0015-.002	.002-.003	.002-.004	.003-.005
Cast Iron - Hard	200-300	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003	.003-.004
Titanium	80-150	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.0015-.0025	.0025-.0035
Inconel	60-100	.0003-.0006	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.0015-.0025	.002-.003

# HPT HIGH PERFORMANCE TAPS



CNC Reduced Neck Design

## MATERIAL SPECIFIC GEOMETRY

Application specific geometries engineered for high performance, high productivity tapping in a variety of materials. Morse Cutting Tools offers a complete selection of styles, sizes and "H" limits including metric sizes enabling you to choose the right tap to optimize your tapping application.

Powder metallurgy high speed steel, unique geometry, surface finish and tool coating ensure consistent, predictable performance, superior thread quality and excellent tool life for lower cost per tapped hole.

## P/M POWDER METALLURGY HIGH SPEED STEEL

Premium Steel Engineered For

Hardness / Wear Resistance / Tool Life  
Heat Resistance / Toughness and Strength  
Performance Under Difficult Cutting Conditions  
Higher Cutting Speeds / Increased Productivity

## SURFACE FINISHES / TOOL COATINGS

**Steam Oxide Finish** increases wear resistance, reduces friction, loading and galling, helps retain cutting fluids, improves thread quality and extends tool life.

**Steam Oxide Over Nitride Finish** features a hard abrasion resistant **Nitrided Base** for enhanced tool life in abrasive materials including cast iron. **Steam Oxide** surface treatment helps toughen the nitrided base, reduces friction, loading and galling, helps retain cutting fluids, improves thread quality and extends tool life.

**TiCN - Titanium Carbonitride Coating** increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

**CrN - Chromium Nitride Coating** increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

**Recommended for softer materials including aluminum.**

# APPLICATIONS

## FOR ALUMINUM

Spiral Point / Spiral Flute / Bright Finish / CrN (Chromium Nitride) Coated

**Recommended for all types of aluminum alloys. CrN coating especially recommended for high-silicon aluminum alloys.**

## FOR EXOTIC ALLOYS

Spiral Point / Spiral Flute / Steam Oxide Finish / TiCN Coated

**Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 32Rc hardness.**

## FOR HARD MATERIALS

Spiral Point / Spiral Flute / Steam Oxide Finish / TiCN Coated

**Recommended for harder (32Rc- 45Rc) materials including steel alloys, titanium alloys, nickel base high temperature alloys, tool and mold steels and stainless steels**

## FOR CAST IRON

Straight Flute / Steam Oxide Over Nitride Finish

**Recommended for all types of gray, ductile and malleable cast iron**

# GEOMETRY

**Spiral Point Taps** are designed for efficient tapping of through holes and blind holes with adequate depth for chip accumulation at the bottom of the hole. The shearing action of the point provides freer cutting action and ejects the chips ahead of the tap, eliminating chip evacuation problems and chip damage to the threads. Shallower flutes also result in greater tap strength, allowing for higher cutting speeds.

**Spiral Flute Taps** are designed to lift the chips out of the hole in blind hole tapping, eliminating chip evacuation problems which can result in damaged threads and broken taps. They will also bridge openings, keyways and other interruptions in the tapped hole.

**Plug Style** (3-5 thread chamfer) is the most common chamfer used for tapping applications in through holes and blind holes with sufficient bottom clearance.

**Semi-Bottoming Style** (2-3 thread chamfer) allows threading close to the bottom of blind holes but cuts more efficiently than standard bottoming taps due to a slightly longer chamfer which distributes the cutting load over a greater number of teeth.

**Semi-Interrupted Threads** help to break the chips and enhance coolant flow to the cutting teeth for reduced chance of torn threads and improved thread quality.

**CNC Reduced Neck Design** enhances chip evacuation and cutting fluid flow to the cutting teeth for reduced friction, heat and galling. Also reduces contact between the tap and the workpiece.

# Straight Flute HPT High Performance Taps For Cast Iron

## Semi-Bottoming Style

Taraud à haut rendement

Machuelo de alto rendimiento

Recommended for all types of gray, ductile and malleable cast iron.

Premium Powder Metallurgy High Speed Steel  
Steam Oxide over Nitride Finish



List No. 2094 Steam Oxide Over Nitride

CNC Reduced Neck Design

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE OVER NITRIDE LIST NO. 2094			
	UNC	UNF					H2	H3	H4	H5
10	24	—	3	1/2	3/8	2 3/8	—	30140	—	—
10	—	32	3	1/2	3/8	2 3/8	30141	30142	—	—
1/4	20	—	4	5/8	3/8	2 1/2	—	30143	—	30144
1/4	—	28	4	5/8	3/8	2 1/2	—	30145	30146	—
5/16	18	—	4	1 1/16	7/16	2 23/32	—	30147	—	30148
5/16	—	24	4	1 1/16	7/16	2 23/32	—	30149	30150	—
3/8	16	—	4	3/4	1/2	2 15/16	—	30151	—	30152
3/8	—	24	4	3/4	1/2	2 15/16	—	30153	30154	—
7/16	14	—	4	7/8	9/16	3 5/32	—	30155	—	30156
7/16	—	20	4	7/8	9/16	3 5/32	—	30157	—	30158
1/2	13	—	4	1 5/16	2 3/32	3 3/8	—	30159	—	30160
1/2	—	20	4	1 5/16	2 3/32	3 3/8	—	30161	—	30162

## Metric

List No. 2094M Steam Oxide Over Nitride

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE OVER NITRIDE LIST NO. 2094M
							EDP NO.
M6	1.0	D5	4	5/8	3/8	2 1/2	30180
M8	1.0	D5	4	1 1/16	7/16	2 23/32	30181
M8	1.25	D5	4	1 1/16	7/16	2 23/32	30182
M10	1.5	D6	4	3/4	1/2	2 15/16	30183
M12	1.5	D5	4	1 5/16	2 3/32	3 3/8	30184
M12	1.75	D6	4	1 5/16	2 3/32	3 3/8	30185

Cutting Speeds: Page 144

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

HPT High Performance Taps

# Spiral Point HPT High Performance Taps For Aluminum Plug Style

Taraud à haut rendement

Machuelo de alto rendimiento



Recommended for all types of aluminum alloys.

Premium Powder Metallurgy High Speed Steel  
Bright Finish and CrN (Chromium Nitride) Coated  
Semi-Interrupted Thread (3-Flute taps only)

List No. 2092 Bright Finish

List No. 2092S

CrN - Chromium Nitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

CNC Reduced Neck Design

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	BRIGHT FINISH LIST NO. 2092					CRN COATED LIST NO. 2092S						
	UNC	UNF					H1	H2	H3	H4	H5	H1	H2	H3	H4	H5		
4	40	—	2	5/16	1/4	17/8	—	30000	—	—	—	—	—	—	60700	—	—	—
4	—	48	2	5/16	1/4	17/8	30001	30002	—	—	—	—	60701	60702	—	—	—	
5	40	—	2	5/16	5/16	1 15/16	—	30003	—	—	—	—	—	60703	—	—	—	
6	32	—	2	3/8	5/16	2	—	30004	30005	—	—	—	—	60704	60705	—	—	
6	—	40	2	3/8	5/16	2	—	30006	—	—	—	—	—	60706	—	—	—	
8	32	—	3	3/8	3/8	2 1/8	—	30007	30008	—	—	—	—	60707	60708	—	—	
8	—	36	3	3/8	3/8	2 1/8	—	30009	—	—	—	—	—	60709	—	—	—	
10	24	—	3	1/2	3/8	2 3/8	—	—	30010	—	—	—	—	—	60710	—	—	
10	—	32	3	1/2	3/8	2 3/8	—	30011	30012	—	—	—	—	60711	60712	—	—	
1/4	20	—	3	5/8	3/8	2 1/2	—	—	30013	—	—	30014	—	—	60713	—	60714	
1/4	—	28	3	5/8	3/8	2 1/2	—	—	30015	30016	—	—	—	—	60715	60716	—	
5/16	18	—	3	1 1/16	7/16	2 23/32	—	—	30017	—	—	30018	—	—	60717	—	60718	
5/16	—	24	3	1 1/16	7/16	2 23/32	—	—	30019	30020	—	—	—	—	60719	60720	—	
3/8	16	—	3	3/4	1/2	2 15/16	—	—	30021	—	—	30022	—	—	60721	—	60722	
3/8	—	24	3	3/4	1/2	2 15/16	—	—	30023	30024	—	—	—	—	60723	60724	—	
7/16	14	—	3	7/8	9/16	3 5/32	—	—	30025	—	—	30026	—	—	60725	—	60726	
7/16	—	20	3	7/8	9/16	3 5/32	—	—	30027	—	—	30028	—	—	60727	—	60728	
1/2	13	—	3	1 5/16	23/32	3 3/8	—	—	30029	—	—	30030	—	—	60729	—	60730	
1/2	—	20	3	1 5/16	23/32	3 3/8	—	—	30031	—	—	30032	—	—	60731	—	60732	

Semi-Interrupted Thread on 3-Flute Taps Only

## Metric

List No. 2092M Bright Finish

List No. 2092MS CrN - Chromium Nitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	BRIGHT FINISH LIST NO. 2092M		CRN COATED LIST NO. 2092MS	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	2	5/16	5/16	1 15/16	30050	—	60750	—
M4	0.7	D4	3	3/8	3/8	2 1/8	30051	—	60751	—
M5	0.8	D4	3	1/2	3/8	2 3/8	30052	—	60752	—
M6	1.0	D5	3	5/8	3/8	2 1/2	30053	—	60753	—
M8	1.0	D5	3	1 1/16	7/16	2 23/32	30054	—	60754	—
M8	1.25	D5	3	1 1/16	7/16	2 23/32	30055	—	60755	—
M10	1.5	D6	3	3/4	1/2	2 5/16	30056	—	60756	—
M12	1.5	D5	3	1 5/16	23/32	3 3/8	30057	—	60757	—
M12	1.75	D6	3	1 5/16	23/32	3 3/8	30058	—	60758	—

Semi-Interrupted Thread on 3-Flute Taps Only

HPT High Performance Taps

# Spiral Flute HPT High Performance Taps For Aluminum

Taraud à haut rendement

Machuelo de alto rendimiento

CNC Reduced Neck Design



## Semi-Bottoming Style

Recommended for all types of aluminum alloys.

Premium Powder Metallurgy High Speed Steel  
Bright Finish and CrN (Chromium Nitride) Coated  
Semi-Interrupted Thread (3-Flute taps only).

List No. 2093 Bright Finish

List No. 2093S

CrN - Chromium Nitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	BRIGHT FINISH LIST NO. 2093					CRN COATED LIST NO. 2093S					
	UNC	UNF					H1	H2	H3	H4	H5	H1	H2	H3	H4	H5	
4	40	—	2	15/64	21/64	17/8	—	30070	—	—	—	—	—	60770	—	—	—
4	—	48	2	15/64	21/64	17/8	30071	30072	—	—	—	—	60771	60772	—	—	—
5	40	—	2	15/64	25/64	1 15/16	—	30073	—	—	—	—	—	60773	—	—	—
6	32	—	2	15/64	29/64	2	—	30074	30075	—	—	—	—	60774	60775	—	—
6	—	40	2	15/64	29/64	2	—	30076	—	—	—	—	—	60776	—	—	—
8	32	—	2	15/64	33/64	2 1/8	—	30077	30078	—	—	—	—	60777	60778	—	—
8	—	36	2	15/64	33/64	2 1/8	—	30079	—	—	—	—	—	60779	—	—	—
10	24	—	2	11/32	17/32	2 3/8	—	—	30080	—	—	—	—	—	60780	—	—
10	—	32	2	11/32	17/32	2 3/8	—	30081	30082	—	—	—	—	60781	60782	—	—
1/4	20	—	2	7/16	9/16	2 1/2	—	—	30083	—	—	30084	—	—	60783	—	60784
1/4	—	28	2	7/16	9/16	2 1/2	—	—	30085	30086	—	—	—	—	60785	60786	—
5/16	18	—	2	15/32	21/32	2 23/32	—	—	30087	—	—	30088	—	—	60787	—	60788
5/16	—	24	2	15/32	21/32	2 23/32	—	—	30089	30090	—	—	—	—	60789	60790	—
3/8	16	—	2	35/64	45/64	2 15/16	—	—	30091	—	—	30092	—	—	60791	—	60792
3/8	—	24	2	35/64	45/64	2 15/16	—	—	30093	30094	—	—	—	—	60793	60794	—
7/16	14	—	3	19/32	27/32	3 5/32	—	—	30095	—	—	30096	—	—	60795	—	60796
7/16	—	20	3	19/32	27/32	3 5/32	—	—	30097	—	—	30098	—	—	60797	—	60798
1/2	13	—	3	5/8	1 1/32	3 3/8	—	—	30099	—	—	30100	—	—	60799	—	60800
1/2	—	20	3	5/8	1 1/32	3 3/8	—	—	30101	—	—	30102	—	—	60801	—	60802

Semi-Interrupted Thread on 3-Flute Taps Only

Cutting Speeds: Page 144

## Metric

List No. 2093M Bright Finish

List No. 2093MS CrN - Chromium Nitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	BRIGHT FINISH LIST NO. 2093M		CRN COATED LIST NO. 2093MS	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	2	15/64	25/64	1 15/16	30120	—	60820	—
M4	0.7	D4	2	15/64	33/64	2 1/8	30121	—	60821	—
M5	0.8	D4	2	23/64	17/32	2 3/8	30122	—	60822	—
M6	1.0	D5	2	7/16	9/16	2 1/2	30123	—	60823	—
M8	1.0	D5	2	15/32	21/32	2 23/32	30124	—	60824	—
M8	1.25	D5	2	15/32	21/32	2 23/32	30125	—	60825	—
M10	1.5	D6	2	35/64	11/16	2 15/16	30126	—	60826	—
M12	1.5	D5	3	5/8	1 1/64	3 3/8	30127	—	60827	—
M12	1.75	D6	3	5/8	1 1/64	3 3/8	30128	—	60828	—

Semi-Interrupted Thread on 3-Flute Taps Only

HPT High Performance Taps

# Spiral Point HPT High Performance Taps For Exotic Alloys

Taraud à haut rendement

Machuelo de alto rendimiento

CNC Reduced Neck Design

## Plug Style

Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 32Rc hardness.

Premium Powder Metallurgy High Speed Steel Steam Oxide Finish and TiCN Coated



List No. 2095 Steam Oxide Finish

List No. 2095C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2095				TiCN COATED		LIST NO. 2095C	
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	5/16	1/4	1 7/8	30200	—	—	—	60840	—	—	—
5	40	—	2	5/16	5/16	1 15/16	30201	—	—	—	60841	—	—	—
6	32	—	2	3/8	5/16	2	30202	30203	—	—	60842	60843	—	—
8	32	—	3	3/8	3/8	2 1/8	30204	30205	—	—	60844	60845	—	—
10	24	—	3	1/2	3/8	2 3/8	—	30206	—	—	—	60846	—	—
10	—	32	3	1/2	3/8	2 3/8	30208	30209	—	—	60848	60849	—	—
1/4	20	—	3	5/8	3/8	2 1/2	—	30210	—	30211	—	60850	—	60851
1/4	—	28	3	5/8	3/8	2 1/2	—	30212	30213	—	—	60852	60853	—
5/16	18	—	3	1 1/16	7/16	2 23/32	—	30214	—	30215	—	60854	—	60855
5/16	—	24	3	1 1/16	7/16	2 23/32	—	30216	30217	—	—	60856	60857	—
3/8	16	—	3	3/4	1/2	2 15/16	—	30218	—	30219	—	60858	—	60859
3/8	—	24	3	3/4	1/2	2 15/16	—	30220	30221	—	—	60860	60861	—
7/16	14	—	3	7/8	9/16	3 5/8	—	30222	—	30223	—	60862	—	60863
7/16	—	20	3	7/8	9/16	3 5/8	—	30224	—	30225	—	60864	—	60865
1/2	13	—	3	1 5/16	2 3/32	3 3/8	—	30226	—	30227	—	60866	—	60867
1/2	—	20	3	1 5/16	2 3/32	3 3/8	—	30228	—	30229	—	60868	—	60869
9/16	12	—	4	1	4 3/64	3 19/32	—	30230	—	30231	—	60870	—	60871
9/16	—	18	4	1	4 3/64	3 19/32	—	30232	—	30233	—	60872	—	60873
5/8	11	—	4	1 1/8	4 3/64	3 13/16	—	30234	—	30235	—	60874	—	60875
5/8	—	18	4	1 1/8	4 3/64	3 13/16	—	30236	—	30237	—	60876	—	60877
3/4	10	—	4	1 7/32	4 9/64	4 1/4	—	30238	—	30239	—	60878	—	60879
3/4	—	16	4	1 7/32	4 9/64	4 1/4	—	30240	—	30241	—	60880	—	60881

## Metric

List No. 2095M Steam Oxide Finish

List No. 2095MC TiCN - Titanium Carbonitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2095M		TiCN COATED LIST NO. 2095MC	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	2	5/16	5/16	1 15/16	30260	—	60900	—
M4	0.7	D4	3	3/8	3/8	2 1/8	30261	—	60901	—
M5	0.8	D4	3	1/2	3/8	2 3/8	30262	—	60902	—
M6	1.0	D5	3	5/8	3/8	2 1/2	30263	—	60903	—
M8	1.0	D5	3	1 1/16	7/16	2 23/32	30264	—	60904	—
M8	1.25	D5	3	1 1/16	7/16	2 23/32	30265	—	60905	—
M10	1.5	D6	3	3/4	1/2	2 15/16	30266	—	60906	—
M12	1.5	D5	3	1 5/16	2 3/32	3 3/8	30267	—	60907	—
M12	1.75	D6	3	1 5/16	2 3/32	3 3/8	30268	—	60908	—

HPT High Performance Taps



# Spiral Flute HPT High Performance Taps For Exotic Alloys Semi-Bottoming Style

Taraud à haut rendement

Machuelo de alto rendimiento

CNC Reduced Neck Design



Recommended for steels, steel alloys, stainless steels, titanium alloys, nickel and nickel base alloys, other exotic alloys and a wide variety of materials up to 32Rc hardness.

Premium Powder Metallurgy High Speed Steel Steam Oxide Finish and TiCN Coated

List No. 2096 Steam Oxide Finish

List No. 2096C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2096				TiCN COATED LIST NO. 2096C				
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5	
4	40	—	3	1 <sup>5</sup> / <sub>64</sub>	2 <sup>1</sup> / <sub>64</sub>	1 <sup>7</sup> / <sub>8</sub>	30280	—	—	—	—	60920	—	—	—
5	40	—	3	1 <sup>5</sup> / <sub>64</sub>	2 <sup>5</sup> / <sub>64</sub>	1 <sup>15</sup> / <sub>16</sub>	30281	—	—	—	—	60921	—	—	—
6	32	—	3	1 <sup>5</sup> / <sub>64</sub>	2 <sup>9</sup> / <sub>64</sub>	2	30282	30283	—	—	—	60922	60923	—	—
8	32	—	3	1 <sup>5</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>64</sub>	2 <sup>1</sup> / <sub>8</sub>	30284	30285	—	—	—	60924	60925	—	—
10	24	—	3	2 <sup>3</sup> / <sub>64</sub>	1 <sup>7</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>8</sub>	—	30286	—	—	—	—	60926	—	—
10	—	32	3	2 <sup>3</sup> / <sub>64</sub>	1 <sup>7</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>8</sub>	30288	30289	—	—	—	60928	60929	—	—
1/4	20	—	3	7/16	9/16	2 <sup>1</sup> / <sub>2</sub>	—	30290	—	30291	—	—	60930	—	60931
1/4	—	28	3	7/16	9/16	2 <sup>1</sup> / <sub>2</sub>	—	30292	30293	—	—	—	60932	60933	—
5/16	18	—	3	1 <sup>5</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	—	30294	—	30295	—	—	60934	—	60935
5/16	—	24	3	1 <sup>5</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	—	30296	30297	—	—	—	60936	60937	—
3/8	16	—	3	3 <sup>5</sup> / <sub>64</sub>	1 <sup>1</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	—	30298	—	30299	—	—	60938	—	60939
3/8	—	24	3	3 <sup>5</sup> / <sub>64</sub>	1 <sup>1</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	—	30300	30301	—	—	—	60940	60941	—
7/16	14	—	3	1 <sup>9</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>	3 <sup>5</sup> / <sub>32</sub>	—	30302	—	30303	—	—	60942	—	60943
7/16	—	20	3	1 <sup>9</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>	3 <sup>5</sup> / <sub>32</sub>	—	30304	—	30305	—	—	60944	—	60945
1/2	13	—	3	5/8	1 <sup>1</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>8</sub>	—	30306	—	30307	—	—	60946	—	60947
1/2	—	20	3	5/8	1 <sup>1</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>8</sub>	—	30308	—	30309	—	—	60948	—	60949
9/16	12	—	3	1 <sup>1</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>64</sub>	3 <sup>19</sup> / <sub>32</sub>	—	30310	—	30311	—	—	60950	—	60951
9/16	—	18	3	1 <sup>1</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>64</sub>	3 <sup>19</sup> / <sub>32</sub>	—	30312	—	30313	—	—	60952	—	60953
5/8	11	—	3	3/4	1 <sup>3</sup> / <sub>64</sub>	3 <sup>13</sup> / <sub>16</sub>	—	30314	—	30315	—	—	60954	—	60955
5/8	—	18	3	3/4	1 <sup>3</sup> / <sub>64</sub>	3 <sup>13</sup> / <sub>16</sub>	—	30316	—	30317	—	—	60956	—	60957
3/4	10	—	3	1 <sup>3</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>4</sub>	—	30318	—	30319	—	—	60958	—	60959
3/4	—	16	3	1 <sup>3</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>4</sub>	—	30320	—	30321	—	—	60960	—	60961

## Metric

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List No. 2096M Steam Oxide Finish

List No. 2096MC TiCN - Titanium Carbonitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2096M		TiCN COATED LIST NO. 2096MC	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	3	1 <sup>5</sup> / <sub>64</sub>	2 <sup>5</sup> / <sub>64</sub>	1 <sup>15</sup> / <sub>16</sub>	30340	—	60980	—
M4	0.7	D4	3	1 <sup>5</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>64</sub>	2 <sup>1</sup> / <sub>8</sub>	30341	—	60981	—
M5	0.8	D4	3	2 <sup>3</sup> / <sub>64</sub>	1 <sup>7</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>8</sub>	30342	—	60982	—
M6	1.0	D5	3	7/16	9/16	2 <sup>1</sup> / <sub>2</sub>	30343	—	60983	—
M8	1.0	D5	3	1 <sup>5</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	30344	—	60984	—
M8	1.25	D5	3	1 <sup>5</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	30345	—	60985	—
M10	1.5	D6	3	3 <sup>5</sup> / <sub>64</sub>	1 <sup>1</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	30346	—	60986	—
M12	1.5	D5	3	5/8	1 <sup>1</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>8</sub>	30347	—	60987	—
M12	1.75	D6	3	5/8	1 <sup>1</sup> / <sub>64</sub>	3 <sup>3</sup> / <sub>8</sub>	30348	—	60988	—

HPT High Performance Taps

# Spiral Point - DIN Length HPT High Performance Taps

Taraud à haut rendement

Machuelo de alto rendimiento



## Plug Style

### DIN Length — ANSI Shank

Recommended for steels, steel alloys, stainless steels, titanium alloys and a wide variety of materials up to 36Rc hardness.

Premium Powder Metallurgy High Speed Steel  
Steam Oxide Finish and TiCN Coated

**DIN Length** – longer than standard USCTI length – provides extra reach in tapping applications

**ANSI Shank** – made to standard American dimensions – fits standard tap holders

List No. 2088 Steam Oxide Finish

List No. 2088C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

**DIN Length**

**STANDARD PACKAGE** All Sizes — 1 each

**CNC Reduced Neck Design**

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	Steam Oxide Finish				TiCN Coated			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	.433	.276	2.205	30530	—	—	—	61160	—	—	—
6	32	—	2	.472	.315	2.205	30532	30533	—	—	61162	61163	—	—
8	32	—	3	.512	.315	2.480	30534	30535	—	—	61164	61165	—	—
10	24	—	3	.591	.393	2.756	—	30536	—	—	—	61166	—	—
10	—	32	3	.512	.472	2.756	30537	30538	—	—	61167	61168	—	—
1/4	20	—	3	.669	.512	3.150	—	30539	—	30540	—	61169	—	61170
1/4	—	28	3	.669	.512	3.150	—	30541	30542	—	—	61171	61172	—
5/16	18	—	3	.787	.591	3.543	—	30543	—	30544	—	61173	—	61174
5/16	—	24	3	.669	.709	3.543	—	30545	30546	—	—	61175	61176	—
3/8	16	—	3	.866	.669	3.937	—	30547	—	30548	—	61177	—	61178
3/8	—	24	3	.709	.826	3.937	—	30549	30550	—	—	61179	61180	—
7/16	14	—	3	.866	*	3.937	—	30551	—	30552	—	61181	—	61182
7/16	—	20	3	.866	*	3.937	—	30553	—	30554	—	61183	—	61184
1/2	13	—	3	.984	*	4.331	—	30555	—	30556	—	61185	—	61186
1/2	—	20	3	.866	*	3.937	—	30557	—	30558	—	61187	—	61188
9/16	12	—	4	1.024	*	4.331	—	30559	—	30560	—	61189	—	61190
9/16	—	18	4	.866	*	3.937	—	30561	—	30562	—	61191	—	61192
5/8	11	—	4	1.063	*	4.331	—	30563	—	30564	—	61193	—	61194
5/8	—	18	4	.866	*	3.937	—	30565	—	30566	—	61195	—	61196
3/4	10	—	4	1.181	*	4.921	—	30567	—	30568	—	61197	—	61198
3/4	—	16	4	.984	*	4.331	—	30569	—	30570	—	61199	—	61200
7/8	9	—	4	1.126	*	5.512	—	—	30571	—	—	—	61201	—
7/8	—	14	4	1.024	*	4.921	—	—	30572	—	—	—	61202	—
1	8	—	4	1.417	*	6.299	—	—	30573	—	—	—	61203	—
1	—	12	4	1.102	*	5.512	—	—	30574	—	—	—	61204	—

## Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	Steam Oxide Finish	
							List No. 2088M EDP NO.	TiCN Coated List No. 2088MC EDP NO.
M4	0.7	D4	3	13	8	63	30576	61206
M5	0.8	D4	3	15	10	70	30577	61207
M6	1.0	D5	3	17	13	80	30578	61208
M8	1.25	D5	3	20	15	90	30579	61209
M10	1.5	D6	3	22	17	100	30580	61210
M12	1.25	D5	3	22	*	100	30581	61211
M12	1.5	D5	3	22	*	100	30582	61212
M12	1.75	D6	3	24	*	110	30583	61213
M14	1.5	D6	4	22	*	100	30584	61214
M14	2	D7	4	26	*	110	30585	61215
M16	2	D7	4	27	*	110	30586	61216
M18	1.5	D6	4	25	*	110	30587	61217
M20	2.5	D7	4	32	*	140	30588	61218
M24	3	D8	4	34	*	160	30589	61219

\*Reduced Shank (shank diameter is smaller than minor diameter)

HPT High Performance Taps

# Spiral Flute - DIN Length HPT High Performance Taps

Taroud à haut rendement

Machuelo de alto rendimiento



**Semi-Bottoming Style**  
**DIN Length — ANSI Shank**

Recommended for steels, steel alloys, stainless steels, titanium alloys and a wide variety of materials up to 36Rc hardness.

Premium Powder Metallurgy High Speed Steel  
Steam Oxide Finish and TiCN Coated

**DIN Length** – longer than standard USCTI length – provides extra reach in tapping applications

**ANSI Shank** – made to standard American dimensions – fits standard tap holders

List No. 2089 Steam Oxide Finish

List No. 2089C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

**DIN Length**

**STANDARD PACKAGE** All Sizes — 1 each

**CNC Reduced Neck Design**

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	Steam Oxide Finish LIST NO. 2089				TiCN Coated LIST NO. 2089C				
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5	
4	40	—	3	.236	.473	2.205	30600	—	—	—	—	61230	—	—	—
6	32	—	3	.236	.551	2.205	30602	30603	—	—	—	61232	61233	—	—
8	32	—	3	.236	.591	2.480	30604	30605	—	—	—	61234	61235	—	—
10	24	—	3	.354	.630	2.756	—	30606	—	—	—	—	61236	—	—
10	—	32	3	.354	.630	2.756	30607	30608	—	—	—	61237	61238	—	—
1/4	20	—	3	.433	.748	3.150	—	30609	—	30610	—	—	61239	—	61240
1/4	—	28	3	.433	.748	3.150	—	30611	30612	—	—	—	61241	61242	—
5/16	18	—	3	.472	.906	3.543	—	30613	—	30614	—	—	61243	—	61244
5/16	—	24	3	.472	.906	3.543	—	30615	30616	—	—	—	61245	61246	—
3/8	16	—	3	.551	.984	3.937	—	30617	—	30618	—	—	61247	—	61248
3/8	—	24	3	.551	.984	3.937	—	30619	30620	—	—	—	61249	61250	—
7/16	14	—	3	.591	*	3.937	—	30621	—	30622	—	—	61251	—	61252
7/16	—	20	3	.591	*	3.937	—	30623	—	30624	—	—	61253	—	61254
1/2	13	—	3	.630	*	4.331	—	30625	—	30626	—	—	61255	—	61256
1/2	—	20	3	.630	*	3.937	—	30627	—	30628	—	—	61257	—	61258
9/16	12	—	3	.690	*	4.331	—	30629	—	30630	—	—	61259	—	61260
9/16	—	18	3	.690	*	3.937	—	30631	—	30632	—	—	61261	—	61262
5/8	11	—	3	.745	*	4.331	—	30633	—	30634	—	—	61263	—	61264
5/8	—	18	3	.745	*	3.937	—	30635	—	30636	—	—	61265	—	61266
3/4	10	—	3	.820	*	4.921	—	30637	—	30638	—	—	61267	—	61268
3/4	—	16	3	.820	*	4.331	—	30639	—	30640	—	—	61269	—	61270
7/8	9	—	4	.911	*	5.512	—	—	30641	—	—	—	—	61271	—
7/8	—	14	4	.911	*	4.921	—	—	30642	—	—	—	—	61272	—
1	8	—	4	1.025	*	6.299	—	—	30643	—	—	—	—	61273	—
1	—	12	4	1.025	*	5.512	—	—	30644	—	—	—	—	61274	—

## Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	Steam Oxide Finish LIST No. 2089M		TiCN Coated LIST No. 2089MC	
							EDP NO.	EDP NO.		
M4	0.7	D4	3	6	15	63	30646	61276		
M5	0.8	D4	3	9	16	70	30647	61277		
M6	1.0	D5	3	11	19	80	30648	61278		
M8	1.25	D5	3	12	23	90	30649	61279		
M10	1.5	D6	3	14	25	100	30650	61280		
M12	1.25	D5	3	16	*	100	30651	61281		
M12	1.5	D5	3	16	*	100	30652	61282		
M12	1.75	D6	3	16	*	110	30653	61283		
M14	1.5	D6	3	18	*	100	30654	61284		
M14	2	D7	3	18	*	110	30655	61285		
M16	2	D7	3	19	*	110	30656	61286		
M18	1.5	D6	3	21	*	110	30657	61287		
M20	2.5	D7	3	21	*	140	30658	61288		
M24	3	D8	4	26	*	160	30659	61289		

\*Reduced Shank (shank diameter is smaller than minor diameter)

HPT High Performance Taps

# Spiral Point HPT High Performance Taps For Hard Materials Plug Style

Taraud à haut rendement

Machuelo de alto rendimiento



Recommended for harder 32Rc-45Rc materials including steel alloys, titanium alloys, nickel base high temp alloys, tool and mold steels and stainless steels.

Premium Powder Metallurgy High Speed Steel  
Steam Oxide Finish and TiCN Coated

List No. 2097 Steam Oxide Finish

List No. 2097C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2097				TiCN COATED LIST NO. 2097C			
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5
4	40	—	2	5/16	1/4	1 7/8	30360	—	—	—	61000	—	—	—
5	40	—	3	5/16	5/16	1 15/16	30361	—	—	—	61001	—	—	—
6	32	—	3	3/8	5/16	2	30362	30363	—	—	61002	61003	—	—
8	32	—	3	3/8	3/8	2 1/8	30364	30365	—	—	61004	61005	—	—
10	24	—	3	1/2	3/8	2 3/8	—	30366	—	—	—	61006	—	—
10	—	32	3	1/2	3/8	2 3/8	30368	30369	—	—	61008	61009	—	—
1/4	20	—	3	5/8	3/8	2 1/2	—	30370	—	30371	—	61010	—	61011
1/4	—	28	3	5/8	3/8	2 1/2	—	30372	30373	—	—	61012	61013	—
5/16	18	—	3	1 1/16	7/16	2 23/32	—	30374	—	30375	—	61014	—	61015
5/16	—	24	3	1 1/16	7/16	2 23/32	—	30376	30377	—	—	61016	61017	—
3/8	16	—	3	3/4	1/2	2 15/16	—	30378	—	30379	—	61018	—	61019
3/8	—	24	3	3/4	1/2	2 15/16	—	30380	30381	—	—	61020	61021	—
7/16	14	—	3	7/8	9/16	3 5/32	—	30382	—	30383	—	61022	—	61023
7/16	—	20	3	7/8	9/16	3 5/32	—	30384	—	30385	—	61024	—	61025
1/2	13	—	3	1 5/16	23/32	3 3/8	—	30386	—	30387	—	61026	—	61027
1/2	—	20	3	1 5/16	23/32	3 3/8	—	30388	—	30389	—	61028	—	61029
9/16	12	—	4	1	43/64	3 19/32	—	30390	—	30391	—	61030	—	61031
9/16	—	18	4	1	43/64	3 19/32	—	30392	—	30393	—	61032	—	61033
5/8	11	—	4	1 1/8	43/64	3 13/16	—	30394	—	30395	—	61034	—	61035
5/8	—	18	4	1 1/8	43/64	3 13/16	—	30396	—	30397	—	61036	—	61037
3/4	10	—	4	1 7/8	49/64	4 1/4	—	30398	—	30399	—	61038	—	61039
3/4	—	16	4	1 7/8	49/64	4 1/4	—	30400	—	30401	—	61040	—	61041

HPT High Performance Taps

## Metric

CNC Reduced Neck Design

List No. 2097M Steam Oxide Finish

List No. 2097MC TiCN - Titanium Carbonitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2097M		TiCN COATED LIST NO. 2097MC	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	3	5/16	5/16	1 15/16	30420	—	61060	—
M4	0.7	D4	3	3/8	3/8	2 1/8	30421	—	61061	—
M5	0.8	D4	3	1/2	3/8	2 3/8	30422	—	61062	—
M6	1.0	D5	3	5/8	3/8	2 1/2	30423	—	61063	—
M8	1.0	D5	3	1 1/16	7/16	2 23/32	30424	—	61064	—
M8	1.25	D5	3	1 1/16	7/16	2 23/32	30425	—	61065	—
M10	1.5	D6	3	3/4	1/2	2 15/16	30426	—	61066	—
M12	1.5	D5	3	1 5/16	23/32	3 3/8	30427	—	61067	—
M12	1.75	D6	3	1 5/16	23/32	3 3/8	30428	—	61068	—

# Spiral Flute HPT High Performance Taps For Hard Materials Semi-Bottoming Style

Taraut à haut rendement

Machuelo de alto rendimiento

CNC Reduced Neck Design



Recommended for harder 32Rc-45Rc materials including steel alloys, titanium alloys, nickel base high temp alloys, tool and mold steels and stainless steels.

Premium Powder Metallurgy High Speed Steel Steam Oxide Finish and TiCN Coated

List No. 2098 Steam Oxide Finish

List No. 2098C

TiCN - Titanium Carbonitride Coated

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

SIZE	TPI		NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2098				TiCN COATED LIST NO. 2098C				
	UNC	UNF					H2	H3	H4	H5	H2	H3	H4	H5	
4	40	—	2	5/16	1/4	1 7/8	30440	—	—	—	61080	—	—	—	
5	40	—	2	5/16	5/16	1 15/16	30441	—	—	—	61081	—	—	—	
6	32	—	2	3/8	5/16	2	30442	30443	—	—	61082	61083	—	—	
8	32	—	2	3/8	3/8	2 1/8	30444	30445	—	—	61084	61085	—	—	
10	24	—	3	1/2	3/8	2 3/8	—	30446	—	—	—	61086	—	—	
10	—	32	3	1/2	3/8	2 3/8	30448	30449	—	—	61088	61089	—	—	
1/4	20	—	3	5/8	3/8	2 1/2	—	30450	—	30451	—	61090	—	61091	
1/4	—	28	3	5/8	3/8	2 1/2	—	30452	30453	—	—	61092	61093	—	
5/16	18	—	3	1 1/16	7/16	2 23/32	—	30454	—	30455	—	61094	—	61095	
5/16	—	24	3	1 1/16	7/16	2 23/32	—	30456	30457	—	—	61096	61097	—	
3/8	16	—	3	3/4	1/2	2 15/16	—	30458	—	30459	—	61098	—	61099	
3/8	—	24	3	3/4	1/2	2 15/16	—	30460	30461	—	—	61100	61101	—	
7/16	14	—	3	7/8	9/16	3 5/32	—	30462	—	30463	—	61102	—	61103	
7/16	—	20	3	7/8	9/16	3 5/32	—	30464	—	30465	—	61104	—	61105	
1/2	13	—	3	1 5/16	23/32	3 3/8	—	30466	—	30467	—	61106	—	61107	
1/2	—	20	3	1 5/16	23/32	3 3/8	—	30468	—	30469	—	61108	—	61109	
9/16	12	—	4	1	43/64	3 19/32	—	30470	—	30471	—	61110	—	61111	
9/16	—	18	4	1	43/64	3 19/32	—	30472	—	30473	—	61112	—	61113	
5/8	11	—	4	1 1/8	43/64	3 13/16	—	30474	—	30475	—	61114	—	61115	
5/8	—	18	4	1 1/8	43/64	3 13/16	—	30476	—	30477	—	61116	—	61117	
3/4	10	—	4	1 7/32	49/64	4 1/4	—	30478	—	30479	—	61118	—	61119	
3/4	—	16	4	1 7/32	49/64	4 1/4	—	30480	—	30481	—	61120	—	61121	

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## Metric

List No. 2098M Steam Oxide Finish

List No. 2098MC TiCN - Titanium Carbonitride Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	STEAM OXIDE FINISH LIST NO. 2098M		TiCN COATED LIST NO. 2098MC	
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M3	0.5	D3	2	5/16	5/16	1 15/16	30490	—	61140	—
M4	0.7	D4	2	3/8	3/8	2 1/8	30491	—	61141	—
M5	0.8	D4	3	1/2	3/8	2 3/8	30492	—	61142	—
M6	1.0	D5	3	5/8	3/8	2 1/2	30493	—	61143	—
M8	1.0	D5	3	1 1/16	7/16	2 23/32	30494	—	61144	—
M8	1.25	D5	3	1 1/16	7/16	2 23/32	30495	—	61145	—
M10	1.5	D6	3	3/4	1/2	2 15/16	30496	—	61146	—
M12	1.5	D5	3	1 5/16	23/32	3 3/8	30497	—	61147	—
M12	1.75	D6	3	1 5/16	23/32	3 3/8	30498	—	61148	—

HPT High Performance Taps

# Spiral Flute HPT High Performance Taper Pipe Taps

Taraud à haut rendement

Machuelo de alto rendimiento



Recommended for low to medium carbon steels, alloy steels, tool steels, stainless steels, titanium alloys and many other materials up to 35Rc hardness.

**Premium Powder Metallurgy** high speed steel for increased toughness, wear resistance and heat resistance in a wide range of materials up to 35Rc hardness. **Enhanced Geometry** especially recommended for tapping **Stainless Steel**.

**EXTRA Length**

**Steam Oxide Finish** increases wear resistance, reduces friction, acts as a lubricant, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**

## List No. 2099

Premium Powder Metallurgy High Speed Steel  
Bright Finish and Steam Oxide Finish  
15° Helix Angle  
2-3½ Thread Chamfer

**Extra Length** – longer than standard USCTI length — provides extra reach in tapping applications

**ANSI Shank** – made to standard American dimensions — fits standard tap holders

**STANDARD PACKAGE** All Sizes — 1 each

## NPT/ANPT Taper Pipe Thread

NPT taper pipe taps are commonly used for tapping pipe fittings and couplings. Assembly requires the use of a thread sealant to ensure a tight seal.

Cutting Speeds: Page 144

Tool Coatings Also Available

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	BRIGHT EDP NO.	SURFACE TREATED EDP NO.
1/16-27	1¼	2⅞	4	36220	36230
1/8-27* (Sm. Sk.)	¾	2¾	4	36221	36231
1/8-27* (Lg. Sk.)	¾	2¾	4	36222	36232
1/4-18	1½	3	4	36223	36233
3/8-18	1½	3⅞	4	36224	36234
1/2-14	1⅞	3⅝	4	36225	36235
3/4-14	1⅞	4⅞	5	36226	36236
1-11½	1¾	4½	5	36227	36237

\*Large shank furnished unless otherwise specified.

## NPTF Dryseal Taper Pipe Thread

**NPTF Dryseal** taper pipe taps produce threads where a tight seal is achieved during assembly by metal-to-metal contact. Used for applications requiring a tight seal without the use of thread sealants.

For 1/8" Taps:  
Small Shank = .3125" dia.  
Large Shank = .4375" dia.

## List No. 2099

**STANDARD PACKAGE** All Sizes — 1 each

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	BRIGHT EDP NO.	SURFACE TREATED EDP NO.
1/16-27	1¼	2⅞	4	36240	36250
1/8-27* (Sm. Sk.)	¾	2¾	4	36241	36251
1/8-27* (Lg. Sk.)	¾	2¾	4	36242	36252
1/4-18	1½	3	4	36243	36253
3/8-18	1½	3⅞	4	36244	36254
1/2-14	1⅞	3⅝	4	36245	36255
3/4-14	1⅞	4⅞	5	36246	36256
1-11½	1¾	4½	5	36247	36257

\*Large shank furnished unless otherwise specified.

# Thread Forming — DIN Length HPT High Performance Taps

Taraud à haut rendement  
Machuelo de alto rendimiento



Premium Powder Metallurgy High Speed Steel  
DIN Length, ANSI Shank

**Thread Forming** taps cold form rather than cut the threads. Advantages include no chips to dispose of, stronger higher quality threads, increased tapping speeds, longer tap life and reduced tap breakage.

**DIN Length** — longer than standard USCTI length — provides extra reach in tapping applications

**ANSI Shank** — made to standard American dimensions — fits standard tap holders

**Lube Grooves** provides a path for lubrication and act as vents to relieve pressure in blind hole tapping.

**Plug Style** (4 threads tapered) for through holes and blind holes with adequate depth. The longer taper lead is easier starting, requires less torque, produces less burr above the mouth of the tapped hole and increases tool life.

**Bottoming Style** (2 threads tapered) for blind holes.

- List No. 2106 Bright Finish
- List No. 2106G TiN Coated
- List No. 2106C TiCN Coated
- List No. 2106T TiAlN Coated

**DIN  
Length**

**Powder Metallurgy High Speed Steel** for enhanced performance and increased tool life under difficult tapping conditions. Recommended for a wide variety of ductile materials up to 28Rc hardness.

**NOTE:** Thread forming taps require a larger **tap drill size** than cutting taps because the material flows during the thread forming process. It may be necessary to experiment to determine the required hole size to produce a specific percent of thread. **Countersinking** before tapping is recommended because the forming process usually displaces material above the mouth of the tapped hole.

**STANDARD PACKAGE** All Sizes — 1 each

Cutting Speeds: Page 144

CNC Reduced Neck Design

TAP DRILL SIZES:  
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CLASS OF FIT  
RECOMMENDATIONS:  
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## Machine Screw — Plug Style

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TiN	TiCN	TiAlN
	UNC	UNF						EDP NO.	COATED EDP NO.	COATED EDP NO.	COATED EDP NO.
4	40	—	H3	.433	.276	2.205	3	30670	94680	61460	61620
	40	—	H5	.433	.276	2.205	3	30671	94681	61461	61621
6	32	—	H3	.472	.315	2.205	3	30672	94682	61462	61622
	32	—	H5	.472	.315	2.205	3	30673	94683	61463	61623
8	32	—	H3	.512	.315	2.480	3	30674	94684	61464	61624
	32	—	H5	.512	.315	2.480	3	30675	94685	61465	61625
10	24	—	H4	.591	.393	2.756	4	30676	94686	61466	61626
	24	—	H6	.591	.393	2.756	4	30677	94687	61467	61627
	—	32	H4	.512	.472	2.756	4	30678	94688	61468	61628
	—	32	H6	.512	.472	2.756	4	30679	94689	61469	61629

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life. Improved thread quality, reduced torque and increased tapping speeds for greater productivity.

**Titanium Carbonitride (TiCN) Coating** is harder than TiN coating for more abrasive materials but has a lower temperature resistance.

**Titanium Aluminum Nitride (TiAlN) Coating** is especially recommended for applications generating higher temperatures.

HPT High Performance Taps

# Thread Forming HPT High Performance Taps

DIN Length

## Machine Screw — Bottoming Style

Taraud à haut rendement

Machuelo de alto rendimiento

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TIALN COATED
	UNC	UNF						EDP NO.	EDP NO.	EDP NO.	EDP NO.
4	40	—	H3	.433	.276	2.205	3	30750	94760	61540	61700
	40	—	H5	.433	.276	2.205	3	30751	94761	61541	61701
6	32	—	H3	.472	.315	2.205	3	30752	94762	61542	61702
	32	—	H5	.472	.315	2.205	3	30753	94763	61543	61703
8	32	—	H3	.512	.315	2.480	3	30754	94764	61544	61704
	32	—	H5	.512	.315	2.480	3	30755	94765	61545	61705
10	24	—	H4	.591	.393	2.756	4	30756	94766	61546	61706
	24	—	H6	.591	.393	2.756	4	30757	94767	61547	61707
	—	32	H4	.512	.472	2.756	4	30758	94768	61548	61708
	—	32	H6	.512	.472	2.756	4	30759	94769	61549	61709

CNC Reduced Neck Design

## Fractional — Plug Style

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TIALN COATED
	UNC	UNF						EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/4	20	—	H4	.669	.512	3.150	4	30690	94700	61480	61640
	20	—	H6	.669	.512	3.150	4	30691	94701	61481	61641
	—	28	H4	.669	.512	3.150	4	30692	94702	61482	61642
	—	28	H6	.669	.512	3.150	4	30693	94703	61483	61643
5/16	18	—	H5	.787	.591	3.543	4	30694	94704	61484	61644
	18	—	H7	.787	.591	3.543	4	30695	94705	61485	61645
	—	24	H5	.669	.591	3.543	4	30696	94706	61486	61646
	—	24	H7	.669	.591	3.543	4	30697	94707	61487	61647
3/8	16	—	H5	.866	.669	3.937	4	30698	94708	61488	61648
	16	—	H7	.866	.669	3.937	4	30699	94709	61489	61649
	—	24	H5	.709	.826	3.937	4	30700	94710	61490	61650
	—	24	H7	.709	.826	3.937	4	30701	94711	61491	61651
7/16	14	—	H5	.866	*	3.937	4	30702	94712	61492	61652
	14	—	H8	.866	*	3.937	4	30703	94713	61493	61653
	—	20	H5	.866	*	3.937	4	30704	94714	61494	61654
	—	20	H8	.866	*	3.937	4	30705	94715	61495	61655
1/2	13	—	H5	.984	*	4.331	4	30706	94716	61496	61656
	13	—	H8	.984	*	4.331	4	30707	94717	61497	61657
	—	20	H5	.866	*	3.937	4	30708	94718	61498	61658
	—	20	H8	.866	*	3.937	4	30709	94719	61499	61659
5/8	11	—	H7	1.063	*	4.331	6	30710	94720	61500	61660
	11	—	H10	1.063	*	4.331	6	30711	94721	61501	61661
	—	18	H7	.866	*	3.937	6	30712	94722	61502	61662
	—	18	H10	.866	*	3.937	6	30713	94723	61503	61663
3/4	10	—	H7	1.181	*	4.921	6	30714	94724	61504	61664
	10	—	H10	1.181	*	4.921	6	30715	94725	61505	61665
	—	16	H7	.984	*	4.331	6	30716	94726	61506	61666
	—	16	H10	.984	*	4.331	6	30717	94727	61507	61667

\* Reduced Shank (shank diameter is smaller than minor diameter)

HPT High Performance Taps



# Thread Forming HPT High Performance Taps

## Fractional — Bottoming Style

DIN  
Length

CNC Reduced Neck Design

Taraud à haut rendement

Machuelo de alto rendimiento

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	NECK LENGTH	OAL	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TIALN COATED
	UNC	UNF						EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/4	20	—	H4	.669	.512	3.150	4	30770	94780	61560	61720
	20	—	H6	.669	.512	3.150	4	30771	94781	61561	61721
	—	28	H4	.669	.512	3.150	4	30772	94782	61562	61722
	—	28	H6	.669	.512	3.150	4	30773	94783	61563	61723
5/16	18	—	H5	.787	.591	3.543	4	30774	94784	61564	61724
	18	—	H7	.787	.591	3.543	4	30775	94785	61565	61725
	—	24	H5	.669	.591	3.543	4	30776	94786	61566	61726
	—	24	H7	.669	.591	3.543	4	30777	94787	61567	61727
3/8	16	—	H5	.866	.669	3.937	4	30778	94788	61568	61728
	16	—	H7	.866	.669	3.937	4	30779	94789	61569	61729
	—	24	H5	.709	.826	3.937	4	30780	94790	61570	61730
	—	24	H7	.709	.826	3.937	4	30781	94791	61571	61731
7/16	14	—	H5	.866	*	3.937	4	30782	94792	61572	61732
	14	—	H8	.866	*	3.937	4	30783	94793	61573	61733
	—	20	H5	.866	*	3.937	4	30784	94794	61574	61734
	—	20	H8	.866	*	3.937	4	30785	94795	61575	61735
1/2	13	—	H5	.984	*	4.331	4	30786	94796	61576	61736
	13	—	H8	.984	*	4.331	4	30787	94797	61577	61737
	—	20	H5	.866	*	3.937	4	30788	94798	61578	61738
	—	20	H8	.866	*	3.937	4	30789	94799	61579	61739
5/8	11	—	H7	1.063	*	4.331	6	30790	94800	61580	61740
	11	—	H10	1.063	*	4.331	6	30791	94801	61581	61741
	—	18	H7	.866	*	3.937	6	30792	94802	61582	61742
	—	18	H10	.866	*	3.937	6	30793	94803	61583	61743
3/4	10	—	H7	1.181	*	4.921	6	30794	94804	61584	61744
	10	—	H10	1.181	*	4.921	6	30795	94805	61585	61745
	—	16	H7	.984	*	4.331	6	30796	94806	61586	61746
	—	16	H10	.984	*	4.331	6	30797	94807	61587	61747

### Metric — Plug Style

SIZE	PITCH	PITCH DIA. LIMIT	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TIALN COATED
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M4	0.7	D6	13	8	63	3	30730	94740	61520	61680
M5	0.8	D7	15	10	70	4	30731	94741	61521	61681
M6	1	D8	17	13	80	4	30732	94742	61522	61682
M8	1.25	D9	20	15	90	4	30733	94743	61523	61683
M10	1.5	D10	22	17	100	4	30734	94744	61524	61684
M12	1.75	D11	24	*	110	4	30735	94745	61525	61685
M14	2	D11	26	*	110	6	30736	94746	61526	61686
M16	2	D12	27	*	110	6	30737	94747	61527	61687
M20	2.5	D12	32	*	140	6	30738	94748	61528	61688

### Metric — Bottoming Style

SIZE	PITCH	PITCH DIA. LIMIT	THREAD LENGTH MM	NECK LENGTH MM	OAL MM	NO. OF LUBE GROOVES	BRIGHT	TIN COATED	TICN COATED	TIALN COATED
							EDP NO.	EDP NO.	EDP NO.	EDP NO.
M4	0.7	D6	13	8	63	3	30810	94820	61600	61760
M5	0.8	D7	15	10	70	4	30811	94821	61601	61761
M6	1	D8	17	13	80	4	30812	94822	61602	61762
M8	1.25	D9	20	15	90	4	30813	94823	61603	61763
M10	1.5	D10	22	17	100	4	30814	94824	61604	61764
M12	1.75	D11	24	*	110	4	30815	94825	61605	61765
M14	2	D11	26	*	110	6	30816	94826	61606	61766
M16	2	D12	27	*	110	6	30817	94827	61607	61767
M20	2.5	D12	32	*	140	6	30818	94828	61608	61768

\* Reduced Shank (shank diameter is smaller than minor diameter)

HPT High Performance Taps

# Application Chart for HPT High Performance Taps

	WORKPIECE MATERIAL	EXAMPLES	HARDNESS		RECOMMENDED TAP			
			BRN	Hrc	SPEED (SFM)	CUTTING TAP		FORMING TAP
						THROUGH HOLE (Use Spiral Point Where Available)	BLIND HOLE (Use Spiral Flute Where Available)	SPEED (SFM)
Steel	Low Carbon (Less Than 0.3% C)	1008, 1118, 12L14, 1213, 1513, A36	< 200	<15	25 - 50	-	-	50 - 100
	Medium Carbon (0.3% - 0.6% C)	1030, 1040, 1045, 1050,	< 275	< 28	15 - 40	DIN Length or Exotic	Din Length or Exotic	30 - 80
	High Carbon, Alloyed (More than 0.6% C)	1070, 1080, 1561, 1572	< 300	< 32	15 - 30	DIN Length or Exotic	Din Length or Exotic	-
	Hardened	4140, Hard 1340, 50100	275 - 320	28 - 34	12 - 25	Exotic	Exotic	-
320 - 420			34 - 45	5 - 15	Hard Material	Hard Material	-	
Stainless Steel	Free Machining	303,410, 416, 440F	<275	< 28	25 - 40	DIN Length or Exotic	DIN Length or Exotic	50 - 80
	Austenitic	200 Series, 300 Series	< 275	< 28	15 - 35	DIN Length or Exotic	Exotic or DIN Length	30 - 70
		Nitronic 32, 40, 50, 60	350-425	38 - 45	5 - 10	Hard Material	Hard Material	-
	Martensitic & Ferritic	400 Series: 416 Se, 420F, 420FSe; 440F, 440FSe	< 275	< 28	20 - 35	DIN Length or Exotics	DIN Length or Exotics	40 - 70
Hardened	15-5 PH, 17-4 PH, A-236, AM-350	275 - 320	28 - 34	5 - 15	Exotic	Exotic	-	
		320 - 425	34 - 45	5 - 15	Hard Material	Hard Material	-	
Tool Steel	Hot Work, Cold Work, Mold	A2, D2, H11, P2, P4	275 - 320	28 - 34	7 - 20	DIN Length or Exotic	DIN Length or Exotic	-
			320 - 420	34 - 45	3 - 10	Hard Material	Hard Material	-
Cast Iron	Grey, Pearlitic, Ferritic	ASTM A48 Class 20; 25; 30; 40; 50; SAIJ 431C Grade G1800; 3000; 4000	<260	<26	35 - 60	Cast Iron or Hard Material	Cast Iron or Hard Material	-
	Ductile, Pearlitic, Ferritic	ASTM A536 GRADES 60-40-18; 65-45-12; 80-55-06	<260	<26	20 - 40	Cast Iron or Hard Material	Cast Iron or Hard Material	-
	Malleable	ASTM A47 Grades 32510; 35018, ASTM A 220; Grades 40010; 45006; 60004; 70003; 80002	<260	<26	10 - 30	Cast Iron or Hard Material	Cast Iron or Hard Material	-
Titanium Alloys	Commercially Pure	99.5, 99.2, 98.9, Ti-0.2 Pd, Ti code - 12	< 275	< 28	25 - 45	Exotic	Exotic	50 - 90
	Alpha and Beta Alloys Annealed	Ti-5Al-2.55 Sn, Ti-6Al-4V	275 - 320	28 - 34	10 - 25	Exotic or DIN Length	Exotic or DIN Length	-
	Alpha and Beta Alloys Solution Treated and Aged	Ti-6Al-4V ELI, Ti-6Al-6V-2 Sn	320 - 420	34 - 45	2 - 8	Hard Material	Hard Material	-
Nickel Alloys	Nickel and Nickel Base Alloys Wrought and Cast	Nickel 200, Monel Alloy 400, Duranickel Alloy 301	170 - 250	< 25	10 - 25	Exotic	Exotic	-
	Nickel Base High Temperature Alloys Wrought and Cast	Inconel 718, Nimonic 90, Rene 41, Hastelloy B and C, Inconel 600	250 - 320	28 - 34	6 - 12	Exotic	Exotic	-
320 - 420			34 - 45	3 - 10	Hard Material	Hard Material	-	
Aluminum Alloys	Unalloyed	1000 Series	-	-	40 - 80	Aluminum	Aluminum	80 - 160
	Wrought	2000, 3000, 5000, 6000, 7000 Series	-	-	70 - 100	Aluminum	Aluminum	140 - 200
	Cast	360, A380	-	-	60 - 90	Aluminum	Aluminum	120 - 180

**SPEEDS in Surface Feet per Minute (SFM)** are suggested starting points and may be increased or decreased depending on actual material and machining conditions.

**SPEEDS** may be increased for coated taps, reduced percentage of full threads, fine pitch taps, and spiral point taps.

**SPEEDS** may need to be decreased for coarse pitch taps, higher percentages of full thread, and spiral flute taps.

**PIPE TAPS** should be run at one half to three quarters of the speed for taps of comparable pitch and diameter.

# Spiral Point

Taraut à entrée hélicoïdale

Machuelo con punta en espiral

## SHEARTAP™

Premium High Speed Steel  
Plug Style

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

“SHEARTAP” offers exceptional value for high volume production tapping in long-chipping steels and stainless steels up to 35 Rc Hardness.

**Steam Oxide Over Nitride** resists chip welding, increases lubricity and helps to retain cutting fluid. **TiN Coating** increases hardness and lubricity for improved thread quality, higher speeds and longer tool life.



List No. 2090 — Steam Oxide Over Nitride

List No. 2090G — TiN Coated

**STANDARD** Machine Screw Sizes — 12 each  
**PACKAGE** Fractional Sizes 1/4" thru 1/2" — 12 each  
 9/16" thru 3/4" — 3 each  
 7/8" thru 2" — 1 each

CNC Reduced Neck Design

Cutting Speeds: Page 184

SIZE	THREAD TYPE	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	SURFACE TREATED				TIN COATED			
						H2	H3	H4	H5	H2	H3	H4	H5
#4-40	NC	2	.313	.250	1 7/8	34400	34401	—	34402	94400	94401	—	94402
#6-32	NC	2	.375	.313	2	34404	34405	—	34406	94404	94405	—	94406
#8-32	NC	3	.375	.375	2 1/8	34407	34408	—	34409	94407	94408	—	94409
#10-24	NC	3	.500	.375	2 3/8	—	34410	—	—	—	94410	—	—
#10-32	NF	3	.500	.375	2 3/8	34411	34412	—	34413	94411	94412	—	94413
1/4-20	NC	3	.625	.375	2 1/2	34416	34417	—	34418	94416	94417	—	94418
1/4-28	NF	3	.625	.375	2 1/2	34419	34420	34421	—	94419	94420	94421	—
5/16-18	NC	3	.688	.438	2 23/32	—	34422	—	34423	—	94422	—	94423
5/16-24	NF	3	.688	.438	2 23/32	—	34424	34425	—	—	94424	94425	—
3/8-16	NC	3	.750	.500	2 15/16	—	34426	—	34427	—	94426	—	94427
3/8-24	NF	3	.750	.500	2 15/16	—	34428	34429	—	—	94428	94429	—
7/16-14	NC	3	.875	.563	3 5/32	—	34430	—	34431	—	94430	—	94431
7/16-20	NF	3	.875	.563	3 5/32	—	34432	—	34433	—	94432	—	94433
1/2-13	NC	3	.938	.719	3 3/8	—	34434	—	34435	—	94434	—	94435
1/2-20	NF	3	.938	.719	3 3/8	—	34436	—	34437	—	94436	—	94437
9/16-12	NC	4	1.000	.673	3 19/32	—	34438	—	—	—	94438	—	—
9/16-18	NF	4	1.000	.673	3 19/32	—	34439	—	—	—	94439	—	—
5/8-11	NC	4	1.125	.673	3 13/16	—	34440	—	—	—	94440	—	—
5/8-18	NF	4	1.125	.673	3 13/16	—	34441	—	—	—	94441	—	—
3/4-10	NC	4	1.219	.766	4 1/4	—	34444	—	—	—	94444	—	—
3/4-16	NF	4	1.219	.766	4 1/4	—	34445	—	—	—	94445	—	—
7/8-9	NC	4	1.344	.875	4 11/16	—	—	34500	—	—	—	94500	—
7/8-14	NF	4	1.344	.875	4 11/16	—	—	34501	—	—	—	94501	—
1-8	NC	4	1.500	1.000	5 1/8	—	—	34502	—	—	—	94502	—
1-12	NF	4	1.500	1.000	5 1/8	—	—	34503	—	—	—	94503	—
1 1/8-7	NC	4	1.719	.843	5 7/16	—	—	34504	—	—	—	94504	—
1 1/8-12	NF	4	1.719	.843	5 7/16	—	—	34505	—	—	—	94505	—
1 1/4-7	NC	4	1.719	.843	5 3/4	—	—	34506	—	—	—	94506	—
1 1/4-12	NF	4	1.719	.843	5 3/4	—	—	34507	—	—	—	94507	—
1 3/8-6	NC	4	2.000	1.000	6 1/16	—	—	34508	—	—	—	94508	—
1 3/8-12	NF	4	2.000	1.000	6 1/16	—	—	34509	—	—	—	94509	—
1 1/2-6	NC	6	2.000	1.000	6 3/8	—	—	34510	—	—	—	94510	—
1 1/2-12	NF	6	2.000	1.000	6 3/8	—	—	34511	—	—	—	94511	—
1 3/4-5*	NC	6	2.406	.782	7	—	—	—	34512*	—	—	—	94512*
2-4 1/2*	NC	6	2.688	.874	7 5/8	—	—	—	34514*	—	—	—	94514*

\*H7 Pitch Dia. Limit (Sizes 1 3/4-5 and 2-4 1/2)

Taps & Dies

# Spiral Flute SHEARTAP™

Premium High Speed Steel – 48° Helix Angle  
Semi-Bottoming Style

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

"SHEARTAP" offers exceptional value for high volume production tapping in long-chipping steels and stainless steels up to 35 Rc Hardness.

**Steam Oxide Over Nitride** resists chip welding, increases lubricity and helps to retain cutting fluid. **TiN Coating** increases hardness and lubricity for improved thread quality, higher speeds and longer tool life.

CNC Reduced Neck Design

Taraud à gorges hélicoïdales

Machuelo de roscar con gavilanes en espiral



List No. 2091 — Steam Oxide Over Nitride

List No. 2091G — TiN Coated

STANDARD Machine Screw Sizes — 12 each

PACKAGE Fractional Sizes 1/4" thru 1/2" — 12 each

9/16" thru 3/4" — 3 each

7/8" thru 2" — 1 each

SIZE	THREAD TYPE	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	SURFACE TREATED				TIN COATED			
						H2	H3	H4	H5	H2	H3	H4	H5
#4-40	NC	3	.236	.327	1 7/8	34450	34451	—	—	94450	94451	—	—
#6-32	NC	3	.236	.452	2	34453	34454	—	34455	94453	94454	—	94455
#8-32	NC	3	.236	.514	2 1/8	34456	34457	—	34458	94456	94457	—	94458
#10-24	NC	3	.354	.521	2 3/8	34459	34460	—	—	94459	94460	—	—
#10-32	NF	3	.354	.521	2 3/8	34461	34462	—	34463	94461	94462	—	94463
1/4-20	NC	3	.433	.567	2 1/2	—	34466	—	34467	—	94466	—	94467
1/4-28	NF	3	.433	.567	2 1/2	—	34468	34469	—	—	94468	94469	—
5/16-18	NC	3	.472	.653	2 23/32	—	34470	—	34471	—	94470	—	94471
5/16-24	NF	3	.472	.653	2 23/32	—	34472	34473	—	—	94472	94473	—
3/8-16	NC	3	.551	.699	2 15/16	—	34474	—	34475	—	94474	—	94475
3/8-24	NF	3	.551	.699	2 15/16	—	34476	34477	—	—	94476	94477	—
7/16-14	NC	3	.591	.847	3 3/32	—	34478	—	34479	—	94478	—	94479
7/16-20	NF	3	.591	.847	3 3/32	—	34480	—	34481	—	94480	—	94481
1/2-13	NC	3	.630	1.026	3 3/8	—	34482	—	34483	—	94482	—	94483
1/2-20	NF	3	.630	1.026	3 3/8	—	34484	—	34485	—	94484	—	94485
9/16-12	NC	3	.690	.983	3 19/32	—	34486	—	—	—	94486	—	—
9/16-18	NF	3	.690	.983	3 19/32	—	34487	—	—	—	94487	—	—
5/8-11	NC	3	.745	1.052	3 13/16	—	34488	—	—	—	94488	—	—
5/8-18	NF	3	.745	1.052	3 13/16	—	34489	—	—	—	94489	—	—
3/4-10	NC	4	.820	1.165	4 1/4	—	34492	—	—	—	94492	—	—
3/4-16	NF	4	.820	1.165	4 1/4	—	34493	—	—	—	94493	—	—
7/8-9	NC	4	.911	1.308	4 11/16	—	—	34520	—	—	—	94520	—
7/8-14	NF	4	.911	1.308	4 11/16	—	—	34521	—	—	—	94521	—
1-8	NC	4	1.025	1.475	5 1/8	—	—	34522	—	—	—	94522	—
1-12	NF	4	1.025	1.475	5 1/8	—	—	34523	—	—	—	94523	—
1 1/8-7	NC	4	1.143	1.419	5 7/16	—	—	34524	—	—	—	94524	—
1 1/8-12	NF	4	1.143	1.419	5 7/16	—	—	34525	—	—	—	94525	—
1 1/4-7	NC	4	1.143	1.419	5 3/4	—	—	34526	—	—	—	94526	—
1 1/4-12	NF	4	1.143	1.419	5 3/4	—	—	34527	—	—	—	94527	—
1 3/8-6	NC	4	1.333	1.667	6 1/16	—	—	34528	—	—	—	94528	—
1 3/8-12	NF	4	1.333	1.667	6 1/16	—	—	34529	—	—	—	94529	—
1 1/2-6	NC	4	1.333	1.667	6 3/8	—	—	34530	—	—	—	94530	—
1 1/2-12	NF	4	1.333	1.667	6 3/8	—	—	34531	—	—	—	94531	—
1 3/4-5*	NC	6	1.600	1.588	7	—	—	—	34532*	—	—	—	94532*
2-4 1/2*	NC	6	1.777	1.588	7 3/8	—	—	—	34534*	—	—	—	94534*

\*H7 Pitch Dia. Limit (Sizes 1 3/4-5 and 2-4 1/2)

# Metric Spiral Point SHEARTAP™

Taraud à entrée hélicoïdale

Machuelo con punta en espiral

CNC Reduced Neck Design

List No. 2090M — Steam Oxide Over Nitride

List No. 2090G — TiN Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	SURFACE TREATED	
							EDP NO.	TIN COATED EDP NO.
M3	0.5	D3	2	.313	.313	1 <sup>15</sup> / <sub>16</sub>	35240	95240
M3.5	0.6	D4	2	.375	.313	2	35241	95241
M4	0.7	D4	3	.375	.375	2 <sup>1</sup> / <sub>8</sub>	35242	95242
M5	0.8	D4	3	.500	.375	2 <sup>3</sup> / <sub>8</sub>	35243	95243
M6	1	D5	3	.625	.375	2 <sup>1</sup> / <sub>2</sub>	35244	95244
M7	1	D5	3	.688	.438	2 <sup>23</sup> / <sub>32</sub>	35245	95245
M8	1	D5	3	.688	.438	2 <sup>23</sup> / <sub>32</sub>	35246	95246
M8	1.25	D5	3	.688	.438	2 <sup>23</sup> / <sub>32</sub>	35247	95247
M10	1.25	D5	3	.750	.500	2 <sup>15</sup> / <sub>16</sub>	35248	95248
M10	1.5	D6	3	.750	.500	2 <sup>15</sup> / <sub>16</sub>	35249	95249
M12	1.25	D5	3	.938	.719	3 <sup>3</sup> / <sub>8</sub>	35250	95250
M12	1.75	D6	3	.938	.719	3 <sup>3</sup> / <sub>8</sub>	35251	95251
M14	1.5	D6	4	1.000	.673	3 <sup>19</sup> / <sub>32</sub>	35252	95252
M14	2	D7	4	1.000	.673	3 <sup>19</sup> / <sub>32</sub>	35253	95253
M16	1.5	D6	4	1.125	.673	3 <sup>13</sup> / <sub>16</sub>	35254	95254
M16	2	D7	4	1.125	.673	3 <sup>13</sup> / <sub>16</sub>	35255	95255
M18	1.5	D6	4	1.125	.719	4 <sup>1</sup> / <sub>32</sub>	35256	95256
M18	2.5	D7	4	1.125	.719	4 <sup>1</sup> / <sub>32</sub>	35257	95257
M20	1.5	D6	4	1.188	.812	4 <sup>15</sup> / <sub>32</sub>	35280	95280
M20	2.5	D7	4	1.188	.812	4 <sup>15</sup> / <sub>32</sub>	35281	95281
M22	1.5	D6	4	1.188	1.031	4 <sup>11</sup> / <sub>16</sub>	35282	95282
M22	2.5	D7	4	1.188	1.031	4 <sup>11</sup> / <sub>16</sub>	35283	95283
M24	2	D7	4	1.422	.797	4 <sup>29</sup> / <sub>32</sub>	35284	95284
M24	3	D8	4	1.422	.797	4 <sup>29</sup> / <sub>32</sub>	35285	95285



STANDARD  
PACKAGE

M3-M12 - 12 each  
M14-M18 - 3 each  
M20-M24 - 1 each

Cutting Speeds:  
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Taps & Dies

# Metric Spiral Flute SHEARTAP™

Taraud à gorges hélicoïdales

Machuelo de roscar con gavilanes en espiral

List No. 2091M — Steam Oxide Over Nitride

List No. 2091G — TiN Coated

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	SURFACE TREATED	
							EDP NO.	TIN COATED EDP NO.
M3	0.5	D3	3	.236	.389	1 <sup>15</sup> / <sub>16</sub>	35258	95258
M3.5	0.6	D4	3	.236	.452	2	35259	95259
M4	0.7	D4	3	.236	.514	2 <sup>1</sup> / <sub>8</sub>	35260	95260
M5	0.8	D4	3	.354	.521	2 <sup>3</sup> / <sub>8</sub>	35261	95261
M6	1	D5	3	.433	.567	2 <sup>1</sup> / <sub>2</sub>	35262	95262
M7	1	D5	3	.472	.653	2 <sup>23</sup> / <sub>32</sub>	35263	95263
M8	1	D5	3	.472	.653	2 <sup>23</sup> / <sub>32</sub>	35264	95264
M8	1.25	D5	3	.472	.653	2 <sup>23</sup> / <sub>32</sub>	35265	95265
M10	1.25	D5	3	.551	.699	2 <sup>15</sup> / <sub>16</sub>	35266	95266
M10	1.5	D6	3	.551	.699	2 <sup>15</sup> / <sub>16</sub>	35267	95267
M12	1.25	D5	3	.630	1.026	3 <sup>3</sup> / <sub>8</sub>	35268	95268
M12	1.75	D6	3	.630	1.026	3 <sup>3</sup> / <sub>8</sub>	35269	95269
M14	1.5	D6	3	.690	.983	3 <sup>19</sup> / <sub>32</sub>	35270	95270
M14	2	D7	3	.690	.983	3 <sup>19</sup> / <sub>32</sub>	35271	95271
M16	1.5	D6	3	.745	1.052	3 <sup>13</sup> / <sub>16</sub>	35272	95272
M16	2	D7	3	.745	1.052	3 <sup>13</sup> / <sub>16</sub>	35273	95273
M18	1.5	D6	4	.813	.983	4 <sup>1</sup> / <sub>32</sub>	35274	95274
M18	2.5	D7	4	.813	.983	4 <sup>1</sup> / <sub>32</sub>	35275	95275
M20	1.5	D6	4	.790	1.210	4 <sup>15</sup> / <sub>32</sub>	35290	95290
M20	2.5	D7	4	.790	1.210	4 <sup>15</sup> / <sub>32</sub>	35291	95291
M22	1.5	D6	4	.790	1.428	4 <sup>11</sup> / <sub>16</sub>	35292	95292
M22	2.5	D7	4	.790	1.428	4 <sup>11</sup> / <sub>16</sub>	35293	95293
M24	2	D7	4	.940	1.279	4 <sup>29</sup> / <sub>32</sub>	35294	95294
M24	3	D8	4	.940	1.279	4 <sup>29</sup> / <sub>32</sub>	35295	95295



STANDARD  
PACKAGE

M3-M12 - 12 each  
M14-M18 - 3 each  
M20-M24 - 1 each

Pitch diameter limits are  
those recommended  
for 6H class of thread.

# Oversize SHEARTAP™

Taraud surdimensionné

Machuelo de roscar extra grande

“SHEARTAP” offers exceptional value for high volume production tapping in long-chipping steels and stainless steels up to 35 Rc Hardness.

**Steam Oxide Over Nitride** resists chip welding, increases lubricity and helps to retain cutting fluid. **TiN Coating** increases hardness and lubricity for improved thread quality, higher speeds and longer tool life.

### CNC Reduced Neck Design

SIZE	THREAD TYPE	PITCH DIA. LIMIT	Spiral Point		Spiral Flute	
			SURFACE TREATED EDP NO.	TIN COATED EDP NO.	SURFACE TREATED EDP NO.	TIN COATED EDP NO.
6-32	NC	H7	34542	94542	34592	94592
8-32	NC	H7	34544	94544	34594	94594
10-24	NC	H7	34546	94546	34596	94596
10-32	NF	H7	34548	94548	34598	94598
1/4-20	NC	H7	34550	94550	34600	94600
1/4-20	NC	H11	34551	94551	34601	94601
1/4-28	NF	H7	34552	94552	34602	94602
1/4-28	NF	H11	34553	94553	34603	94603
5/16-18	NC	H7	34554	94554	34604	94604
5/16-18	NC	H11	34555	94555	34605	94605
5/16-24	NF	H7	34556	94556	34606	94606
5/16-24	NF	H11	34557	94557	34607	94607
3/8-16	NC	H7	34558	94558	34608	94608
3/8-16	NC	H11	34559	94559	34609	94609
3/8-24	NF	H7	34560	94560	34610	94610
3/8-24	NF	H11	34561	94561	34611	94611
7/16-14	NC	H11	34563	94563	34613	94613
7/16-20	NF	H11	34565	94565	34615	94615
1/2-13	NC	H11	34567	94567	34617	94617
1/2-20	NF	H11	34569	94569	34619	94619
9/16-12	NC	H11	34571	94571	34621	94621
9/16-18	NF	H11	34573	94573	34623	94623
5/8-11	NC	H11	34575	94575	34625	94625
5/8-18	NF	H11	34577	94577	34627	94627
3/4-10	NC	H11	34579	94579	34629	94629
3/4-16	NF	H11	34581	94581	34631	94631
7/8-9	NC	H11	34583	94583	34633	94633
7/8-14	NF	H11	34585	94585	34635	94635
1-8	NC	H11	34587	94587	34637	94637
1-12	NF	H11	34589	94589	34639	94639
<b>METRIC</b>						
M3 x 0.5	H7		34670	94670	34680	94690
M4 x 0.7	H7		34671	94671	34681	94691
M5 x 0.8	H7		34672	94672	34682	94692
M6 x 1	H11		34673	94673	34683	94693
M8 x 1.25	H11		34674	94674	34684	94694
M10 x 1.5	H11		34675	94675	34685	94695
M12 x 1.75	H11		34676	94676	34686	94696

Oversize taps are mainly used for parts that will be plated or heat treated after tapping. Also used in materials that tend to shrink after tapping.

PITCH DIA. LIMIT	AMOUNT LARGER THAN BASIC PITCH DIA.
H7	.0030"-.0035"
H11	.0050"-.0055"

## Spiral Point Plug Style

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.



### Inch

List No. 2090 — Steam Oxide Over Nitride

List No. 2090G — TiN Coated

### Metric

List No. 2090M — Steam Oxide Over Nitride

List No. 2090G — TiN Coated

## Spiral Flute Semi-Bottoming Style 48° Helix Angle

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.



### Inch

List No. 2091 — Steam Oxide Over Nitride

List No. 2091G — TiN Coated

### Metric

List No. 2091M — Steam Oxide Over Nitride

List No. 2091G — TiN Coated

# Eight Pitch SHEARTAP™

Eight Pitch taps are often required for applications in the power generation industry and general construction.

“SHEARTAP” offers exceptional value for high volume production tapping in long-chipping steels and stainless steels up to 35 Rc Hardness.

Steam Oxide Over Nitride resists chip welding, increases lubricity and helps to retain cutting fluid. TiN Coating increases hardness and lubricity for improved thread quality, higher speeds and longer tool life.



List No. 2090 — Steam Oxide Over Nitride

List No. 2090G — TiN Coated

# Spiral Point Eight Pitch SHEARTAP™ Plug Style

Taraut à entrée hélicoïdale

Machuelo con punta en espiral

Cutting Speeds: Page 184

Primarily designed for tapping through holes. The spiral point forces the chips ahead of the tap.

SIZE	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	PITCH DIA. LIMIT	SURFACE TREATED	TIN COATED
						EDP NO.	EDP NO.
1-1/8-8	4	1.719	.843	5 <sup>7</sup> / <sub>16</sub>	H5	34650	94650
1-1/4-8	4	1.719	.843	5 <sup>3</sup> / <sub>4</sub>	H5	34651	94651
1-3/8-8	4	2.000	1.000	6 <sup>1</sup> / <sub>16</sub>	H5	34652	94652
1-1/2-8	6	2.000	1.000	6 <sup>3</sup> / <sub>8</sub>	H5	34653	94653
1-5/8-8	6	2.000	1.187	6 <sup>11</sup> / <sub>16</sub>	H6	34654	94654
1-3/4-8	6	2.406	.782	7	H6	34655	94655
1-7/8-8	6	2.406	1.156	7 <sup>9</sup> / <sub>16</sub>	H6	34656	94656
2-8	6	2.688	.874	7 <sup>5</sup> / <sub>8</sub>	H6	34657	94657

# Spiral Flute Eight Pitch SHEARTAP™ 48° Helix Angle Semi-Bottoming Style

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

Taraut à gorges hélicoïdales  
Machuelo de roscar con gavilanes en espiral



List No. 2091 — Steam Oxide Over Nitride

List No. 2091G — TiN Coated

SIZE	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	PITCH DIA. LIMIT	SURFACE TREATED	TIN COATED
						EDP NO.	EDP NO.
1-1/8-8	4	1.143	1.419	5 <sup>7</sup> / <sub>16</sub>	H5	34660	94660
1-1/4-8	4	1.143	1.419	5 <sup>3</sup> / <sub>4</sub>	H5	34661	94661
1-3/8-8	4	1.333	1.667	6 <sup>1</sup> / <sub>16</sub>	H5	34662	94662
1-1/2-8	4	1.333	1.667	6 <sup>3</sup> / <sub>8</sub>	H5	34663	94663
1-5/8-8	6	1.333	1.854	6 <sup>11</sup> / <sub>16</sub>	H6	34664	94664
1-3/4-8	6	1.600	1.588	7	H6	34665	94665
1-7/8-8	6	1.600	1.962	7 <sup>9</sup> / <sub>16</sub>	H6	34666	94666
2-8	6	1.777	1.588	7 <sup>5</sup> / <sub>8</sub>	H6	34667	94667

# ONYX TAP

## CNC Style — Spiral Point Plug Taps

Bright Finish & Steam Oxide Over Nitride

High Speed Steel

For tapping a wide range of materials up to 28Rc hardness.

For tapping through holes. The spiral point forces the chips ahead of the tap.

### TOOL COATINGS

Bright Finish Taps can be Coated for Enhanced Performance & Tool Life

CNC Reduced Neck Design



List No. 2101 - Fractional & Machine Screw

**Reduce Neck Design and Shorter Thread Length** for increased coolant flow to the cutting edge, enhanced chip evacuation and reduced contact between tap and workpiece.

**Bright Finish** for tapping a wide range of materials including Non-Ferrous Materials.

**Steam Oxide over Nitride** increases wear resistance, reduces friction, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **Not recommended for non-ferrous materials.**

Size	Thread Type	No. of Flutes	Thread Length	Neck Length	OAL	BRIGHT			OXIDE OVER NITRIDE		
						H2	H3	H4	H2	H3	H4
#4-40	NC	2	.313	.250	1-7/8	30820	—	—	34700	—	—
#6-32	NC	2	.375	.313	2	30821	30822	—	34697	34701	—
#8-32	NC	2	.375	.375	2-1/8	30823	30824	—	34698	34702	—
#8-32	NC	3	.375	.375	2-1/8	30825	30826	—	34699	34703	—
#10-24	NC	2	.500	.375	2-3/8	—	30827	—	—	34704	—
#10-24	NC	3	.500	.375	2-3/8	—	30828	—	—	34705	—
#10-32	NF	2	.500	.375	2-3/8	—	30829	—	—	34706	—
#10-32	NF	3	.500	.375	2-3/8	—	30830	—	—	34707	—
#12-24	NC	3	.500	.375	2-3/8	—	30831	—	—	34708	—
#12-28	NF	3	.500	.375	2-3/8	—	30832	—	—	34709	—
1/4-20	NC	2	.625	.375	2-1/2	—	30833	—	—	34710	—
1/4-20	NC	3	.625	.375	2-1/2	—	30834	—	—	34711	—
1/4-28	NF	2	.625	.375	2-1/2	—	30835	—	—	34712	—
1/4-28	NF	3	.625	.375	2-1/2	—	30836	—	—	34713	—
5/16-18	NC	2	.688	.438	2-23/32	—	30837	—	—	34740	—
5/16-18	NC	3	.688	.438	2-23/32	—	30838	—	—	34714	—
5/16-24	NF	2	.688	.438	2-23/32	—	30839	—	—	34741	—
5/16-24	NF	3	.688	.438	2-23/32	—	30840	—	—	34715	—
3/8-16	NC	3	.750	.500	2-15/16	—	30841	—	—	34716	—
3/8-24	NF	3	.750	.500	2-15/16	—	30842	—	—	34717	—
7/16-14	NC	3	.875	.563	3-5/32	—	30843	—	—	34718	—
7/16-20	NF	3	.875	.563	3-5/32	—	30844	—	—	34719	—
1/2-13	NC	3	.938	.719	3-3/8	—	30845	—	—	34720	—
1/2-20	NF	3	.938	.719	3-3/8	—	30846	—	—	34721	—
9/16-12	NC	4	1.000	.673	3-19/32	—	30847	—	—	34722	—
9/16-18	NF	4	1.000	.673	3-19/32	—	30848	—	—	34723	—
5/8-11	NC	4	1.125	.673	3-13/16	—	30849	—	—	34724	—
5/8-18	NF	4	1.125	.673	3-13/16	—	30850	—	—	34725	—
3/4-10	NC	4	1.219	.766	4-1/4	—	30851	—	—	34726	—
3/4-16	NF	4	1.219	.766	4-1/4	—	30852	—	—	34727	—
7/8-9	NC	4	1.344	.875	4-11/16	—	—	30853	—	—	34728
7/8-14	NF	4	1.344	.875	4-11/16	—	—	30854	—	—	34729
1-8	NC	4	1.500	1.000	5-1/8	—	—	30855	—	—	34730
1-12	NF	4	1.500	1.000	5-1/8	—	—	30856	—	—	34731
1-14	NS	4	1.500	1.000	5-1/8	—	—	30857	—	—	34742
1-1/8-7	NC	4	1.719	.843	5-7/16	—	—	30858	—	—	34732
1-1/8-12	NF	4	1.719	.843	5-7/16	—	—	30859	—	—	34733
1-1/4-7	NC	4	1.719	.843	5-3/4	—	—	30860	—	—	34734
1-1/4-12	NF	4	1.719	.843	5-3/4	—	—	30861	—	—	34735
1-3/8-6	NC	4	2.000	1.000	6-1/16	—	—	30862	—	—	34736
1-3/8-12	NF	4	2.000	1.000	6-1/16	—	—	30863	—	—	34737
1-1/2-6	NC	6	2.000	1.000	6-3/8	—	—	30864	—	—	34738
1-1/2-12	NF	6	2.000	1.000	6-3/8	—	—	30865	—	—	34739



# ONYX TAP

## CNC Style — Spiral Flute

### Semi-Bottoming Taps

Bright Finish & Steam Oxide Over Nitride

High Speed Steel

For tapping a wide range of materials up to 28Rc hardness.

Primarily designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

### TOOL COATINGS

**Bright Finish Taps can be Coated for Enhanced Performance & Tool Life**

CNC Reduced Neck Design



List No. 2102 - Fractional & Machine Screw

**Reduce Neck Design and Shorter Thread Length** for increased coolant flow to the cutting edge, enhanced chip evacuation and reduced contact between tap and workpiece.

**Bright Finish** for tapping a wide range of materials including Non-Ferrous Materials.

**Steam Oxide over Nitride** increases wear resistance, reduces friction, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **Not recommended for non-ferrous materials.**

Size	Thread Type	No. of Flutes	Thread Length	Neck Length	OAL	BRIGHT			OXIDE OVER NITRIDE		
						H2	H3	H4	H2	H3	H4
#4-40	NC	3	.236	.327	1-7/8	30870	—	—	34750	—	—
#6-32	NC	3	.236	.452	2	30871	30872	—	34748	34751	—
#8-32	NC	3	.236	.514	2-1/8	30873	30874	—	34749	34752	—
#10-24	NC	3	.354	.521	2-3/8	—	30875	—	—	34753	—
#10-32	NF	3	.354	.521	2-3/8	—	30876	—	—	34754	—
#12-24	NC	3	.354	.521	2-3/8	—	30877	—	—	34755	—
#12-28	NF	3	.354	.521	2-3/8	—	30878	—	—	34756	—
1/4-20	NC	3	.433	.567	2-1/2	—	30879	—	—	34757	—
1/4-28	NF	3	.433	.567	2-1/2	—	30880	—	—	34758	—
5/16-18	NC	3	.472	.653	2-23/32	—	30881	—	—	34759	—
5/16-24	NF	3	.472	.653	2-23/32	—	30882	—	—	34760	—
3/8-16	NC	3	.551	.699	2-15/16	—	30883	—	—	34761	—
3/8-24	NF	3	.551	.699	2-15/16	—	30884	—	—	34762	—
7/16-14	NC	3	.591	.847	3-5/32	—	30885	—	—	34763	—
7/16-20	NF	3	.591	.847	3-5/32	—	30886	—	—	34764	—
1/2-13	NC	3	.630	1.026	3-3/8	—	30887	—	—	34765	—
1/2-20	NF	3	.630	1.026	3-3/8	—	30888	—	—	34766	—
9/16-12	NC	3	.690	.983	3-19/32	—	30889	—	—	34767	—
9/16-18	NF	3	.690	.983	3-19/32	—	30890	—	—	34768	—
5/8-11	NC	3	.745	1.052	3-13/16	—	30891	—	—	34769	—
5/8-18	NF	3	.745	1.052	3-13/16	—	30892	—	—	34770	—
3/4-10	NC	4	.820	1.165	4-1/4	—	30893	—	—	34771	—
3/4-16	NF	4	.820	1.165	4-1/4	—	30894	—	—	34772	—
7/8-9	NC	4	.911	1.308	4-11/16	—	—	30895	—	—	34773
7/8-14	NF	4	.911	1.308	4-11/16	—	—	30896	—	—	34774
1-8	NC	4	1.025	1.475	5-1/8	—	—	30897	—	—	34775
1-12	NF	4	1.025	1.475	5-1/8	—	—	30898	—	—	34776
1-14	NS	4	1.025	1.475	5-1/8	—	—	30899	—	—	34785
1-1/8-7	NC	4	1.143	1.419	5-7/16	—	—	30900	—	—	34777
1-1/8-12	NF	4	1.143	1.419	5-7/16	—	—	30901	—	—	34778
1-1/4-7	NC	4	1.143	1.419	5-3/4	—	—	30902	—	—	34779
1-1/4-12	NF	4	1.143	1.419	5-3/4	—	—	30903	—	—	34780
1-3/8-6	NC	4	1.333	1.667	6-1/16	—	—	30904	—	—	34781
1-3/8-12	NF	4	1.333	1.667	6-1/16	—	—	30905	—	—	34782
1-1/2-6	NC	4	1.333	1.667	6-3/8	—	—	30906	—	—	34783
1-1/2-12	NF	4	1.333	1.667	6-3/8	—	—	30907	—	—	34784

# Metric Spiral Point ONYX TAP

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	BRIGHT	OXIDE OVER
							EDP NO.	NITRIDE
							EDP NO.	EDP NO.
M2	0.4	D3	2	.313	.313	1-15/16	30910	34800
M2.5	0.45	D3	2	.313	.313	1-15/16	30911	34801
M3	0.5	D3	2	.313	.313	1-15/16	30912	34802
M3.5	0.6	D4	2	.375	.313	2	30913	34803
M4	0.7	D4	3	.375	.375	2-1/8	30914	34804
M5	0.8	D4	3	.500	.375	2-3/8	30915	34805
M6	1	D5	3	.625	.375	2-1/2	30916	34806
M7	1	D5	3	.688	.438	2-23/32	30917	34807
M8	1	D5	3	.688	.438	2-23/32	30918	34808
M8	1.25	D5	3	.688	.438	2-23/32	30919	34809
M10	1.25	D5	3	.750	.500	2-15/16	30920	34810
M10	1.5	D6	3	.750	.500	2-15/16	30921	34811
M12	1.25	D5	3	.938	.719	3-3/8	30922	34812
M12	1.5	D5	3	.938	.719	3-3/8	30923	34826
M12	1.75	D6	3	.938	.719	3-3/8	30924	34813
M14	1.5	D6	4	1.000	.673	3-19/32	30925	34814
M14	2	D7	4	1.000	.673	3-19/32	30926	34815
M16	1.5	D6	4	1.125	.673	3-13/16	30927	34816
M16	2	D7	4	1.125	.673	3-13/16	30928	34817
M18	1.5	D6	4	1.125	.719	4-1/32	30929	34818
M18	2.5	D7	4	1.125	.719	4-1/32	30930	34819
M20	1.5	D6	4	1.188	.812	4-15/32	30931	34820
M20	2.5	D7	4	1.188	.812	4-15/32	30932	34821
M22	1.5	D6	4	1.188	1.031	4-11/16	30933	34822
M22	2.5	D7	4	1.188	1.031	4-11/16	30934	34823
M24	1.5	D7	4	1.422	.797	4-29/32	30935	34824
M24	2	D7	4	1.422	.797	4-29/32	30936	34827
M24	3	D8	4	1.422	.797	4-29/32	30937	34825

## TOOL COATINGS

Bright Finish Taps can be Coated for Enhanced Performance & Tool Life

Bright Finish & Steam Oxide Over Nitride

CNC Reduced Neck Design



List No. 2101M -  
Metric Spiral Point

Pitch diameter limits are those recommended for 6H class thread.

# Metric Spiral Flute ONYX TAP

Size	Pitch	Pitch Dia. Limit	No. of Flutes	Thread Length	Neck Length	OAL	BRIGHT	OXIDE OVER
							EDP NO.	NITRIDE
							EDP NO.	EDP NO.
M3	0.5	D3	3	.236	.389	1-15/16	30940	34840
M3.5	0.6	D4	3	.236	.452	2	30941	34841
M4	0.7	D4	3	.236	.514	2-1/8	30942	34842
M5	0.8	D4	3	.354	.521	2-3/8	30943	34843
M6	1	D5	3	.433	.567	2-1/2	30944	34844
M7	1	D5	3	.472	.653	2-23/32	30945	34845
M8	1	D5	3	.472	.653	2-23/32	30946	34846
M8	1.25	D5	3	.472	.653	2-23/32	30947	34847
M10	1.25	D5	3	.551	.699	2-15/16	30948	34848
M10	1.5	D6	3	.551	.699	2-15/16	30949	34849
M12	1.25	D5	3	.630	1.026	3-3/8	30950	34850
M12	1.5	D5	3	.630	1.026	3-3/8	30951	34864
M12	1.75	D6	3	.630	1.026	3-3/8	30952	34851
M14	1.5	D6	3	.690	.983	3-19/32	30953	34852
M14	2	D7	3	.690	.983	3-19/32	30954	34853
M16	1.5	D6	3	.745	1.052	3-13/16	30955	34854
M16	2	D7	3	.745	1.052	3-13/16	30956	34855
M18	1.5	D6	4	.813	.983	4-1/32	30957	34856
M18	2.5	D7	4	.813	.983	4-1/32	30958	34857
M20	1.5	D6	4	.790	1.210	4-15/32	30959	34858
M20	2.5	D7	4	.790	1.210	4-15/32	30960	34859
M22	1.5	D6	4	.790	1.428	4-11/16	30961	34860
M22	2.5	D7	4	.790	1.428	4-11/16	30962	34861
M24	1.5	D7	4	.940	1.279	4-29/32	30963	34862
M24	2	D7	4	.940	1.279	4-29/32	30964	34865
M24	3	D8	4	.940	1.279	4-29/32	30965	34863

Bright Finish & Steam Oxide Over Nitride

CNC Reduced Neck Design



List No. 2102M -  
Metric Spiral Flute

# Straight Flute Hand Taps

Taraud à main

Machuelo de roscar manual



**Ground Thread — High Speed Steel  
Bright Finish**

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

Available in sets, taper (8-10 thread chamfer), plug (3-5 thread chamfer) or bottoming (1-2 thread chamfer).

**List No. 2068 — Machine Screw**

**STANDARD PACKAGE** All sizes — 12 each  
Sets (Taper Plug Bottom)

Bold type indicates standard H limit.

**Tool Coating Also Available**

SIZE	UNC	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NO.			
		UNF						SETS	TAPER	PLUG	BOTTOM
0	—	80		2	H1	5/16	1 5/8	<b>33901</b>	<b>33601</b>	<b>33701</b>	<b>33801</b>
	—	80		2	<b>H2</b>	5/16	1 5/8	—	—	<b>33702</b>	<b>33802</b>
1	64	—		2	H1	3/8	1 11/16	<b>33902</b>	<b>33602</b>	<b>33703</b>	<b>33803</b>
	64	—		2	<b>H2</b>	3/8	1 11/16	—	—	<b>33704</b>	—
	—	72		2	H1	3/8	1 11/16	<b>33903</b>	<b>33603</b>	<b>33705</b>	<b>33804</b>
	—	72		2	<b>H2</b>	3/8	1 11/16	—	—	<b>33706</b>	<b>33805</b>
2	56	—		3	H1	7/16	1 3/4	<b>33904</b>	<b>33604</b>	<b>33707</b>	<b>33806</b>
	56	—		3	<b>H2</b>	7/16	1 3/4	—	<b>33605</b>	<b>33708</b>	<b>33807</b>
	—	64		3	<b>H2</b>	7/16	1 3/4	<b>33905</b>	<b>33606</b>	<b>33710</b>	<b>33809</b>
3	48	—		3	H1	1/2	1 13/16	—	—	<b>33711</b>	—
	48	—		3	<b>H2</b>	1/2	1 13/16	<b>33906</b>	<b>33607</b>	<b>33712</b>	<b>33810</b>
	—	56		3	<b>H2</b>	1/2	1 13/16	<b>33907</b>	<b>33608</b>	<b>33714</b>	<b>33812</b>
4	40	—		3	<b>H2</b>	9/16	1 7/8	<b>33909</b>	<b>33610</b>	<b>33716</b>	<b>33814</b>
	—	48		3	<b>H2</b>	9/16	1 7/8	<b>33910</b>	<b>33611</b>	<b>33719</b>	<b>33816</b>
	—	*36		3	<b>H2</b>	9/16	1 7/8	<b>33911</b>	<b>33612</b>	<b>33720</b>	<b>33817</b>
5	40	—		3	H1	5/8	1 15/16	—	—	<b>33721</b>	—
	40	—		3	<b>H2</b>	5/8	1 15/16	<b>33912</b>	<b>33613</b>	<b>33722</b>	<b>33818</b>
	—	44		3	<b>H2</b>	5/8	1 15/16	<b>33913</b>	<b>33614</b>	<b>33724</b>	<b>33820</b>
6	32	—		3	H1	1 1/16	2	<b>33914</b>	<b>33615</b>	<b>33726</b>	<b>33821</b>
	32	—		3	H2	1 1/16	2	<b>33915</b>	<b>33616</b>	<b>33727</b>	<b>33822</b>
	32	—		3	<b>H3</b>	1 1/16	2	<b>33916</b>	<b>33617</b>	<b>33728</b>	<b>33823</b>
	—	40		3	H1	1 1/16	2	—	—	<b>33731</b>	—
	—	40		3	<b>H2</b>	1 1/16	2	<b>33917</b>	<b>33618</b>	<b>33732</b>	<b>33826</b>
8	32	—		4	H1	3/4	2 1/8	<b>33918</b>	<b>33619</b>	<b>33734</b>	<b>33827</b>
	32	—		4	H2	3/4	2 1/8	<b>33919</b>	<b>33620</b>	<b>33735</b>	<b>33828</b>
	32	—		4	<b>H3</b>	3/4	2 1/8	<b>33920</b>	<b>33621</b>	<b>33736</b>	<b>33829</b>
	—	36		4	<b>H2</b>	3/4	2 1/8	<b>33921</b>	<b>33622</b>	<b>33742</b>	<b>33835</b>
10	24	—		4	H1	7/8	2 3/8	<b>33922</b>	<b>33623</b>	<b>33743</b>	<b>33836</b>
	24	—		4	H2	7/8	2 3/8	<b>33923</b>	<b>33624</b>	<b>33744</b>	<b>33837</b>
	24	—		4	<b>H3</b>	7/8	2 3/8	<b>33924</b>	<b>33625</b>	<b>33745</b>	<b>33838</b>
	—	32		4	H1	7/8	2 3/8	<b>33925</b>	<b>33626</b>	<b>33751</b>	<b>33842</b>
	—	32		4	H2	7/8	2 3/8	<b>33926</b>	<b>33627</b>	<b>33752</b>	<b>33843</b>
	—	32		4	<b>H3</b>	7/8	2 3/8	<b>33927</b>	<b>33628</b>	<b>33753</b>	<b>33844</b>
12	24	—		4	<b>H3</b>	15/16	2 3/8	<b>33928</b>	<b>33629</b>	<b>33758</b>	<b>33849</b>
	—	28		4	<b>H3</b>	15/16	2 3/8	<b>33929</b>	<b>33630</b>	<b>33759</b>	<b>33850</b>

\*UNS

Taps & Dies

# Optional Flutes Straight Flute Hand Taps

## Ground Thread — High Speed Steel Bright Finish

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Optional Flutes** taps feature fewer flutes than standard taps for added chip capacity in deeper hole tapping.

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## List No. 2068 — Machine Screw

**STANDARD PACKAGE** All sizes — 12 each

Available in plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer).

Bold type indicates standard H limit.

SIZE	UNC	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NUMBER	
		UNC	UNF					PLUG	BOTTOM
2	56	—	—	2	<b>H2</b>	7/16	1 3/4	<b>33709</b>	<b>33808</b>
4	40	—	—	2	<b>H2</b>	9/16	1 7/8	<b>33717</b>	<b>33815</b>
5	40	—	—	2	<b>H2</b>	5/8	1 5/16	<b>33723</b>	<b>33819</b>
6	32	—	—	2	H2	1 1/16	2	<b>33729</b>	<b>33824</b>
	32	—	—	2	<b>H3</b>	1 1/16	2	<b>33730</b>	<b>33825</b>
	—	40	—	2	<b>H2</b>	1 1/16	2	<b>33733</b>	—
8	32	—	—	2	H2	3/4	2 1/8	<b>33740</b>	<b>33833</b>
	32	—	—	2	<b>H3</b>	3/4	2 1/8	<b>33741</b>	<b>33834</b>
	32	—	—	3	H2	3/4	2 1/8	<b>33738</b>	—
	32	—	—	3	<b>H3</b>	3/4	2 1/8	<b>33739</b>	<b>33832</b>
10	24	—	—	2	H2	7/8	2 3/8	<b>33749</b>	<b>33840</b>
	24	—	—	2	<b>H3</b>	7/8	2 3/8	<b>33750</b>	<b>33841</b>
	24	—	—	3	H2	7/8	2 3/8	<b>33747</b>	—
	24	—	—	3	<b>H3</b>	7/8	2 3/8	<b>33748</b>	<b>33839</b>
	—	32	—	2	H2	7/8	2 3/8	<b>33756</b>	<b>33847</b>
	—	32	—	2	<b>H3</b>	7/8	2 3/8	<b>33757</b>	<b>33848</b>
	—	32	—	3	H2	7/8	2 3/8	<b>33754</b>	<b>33845</b>
	—	32	—	3	<b>H3</b>	7/8	2 3/8	<b>33755</b>	<b>33846</b>

# Surface Treated Straight Flute Hand Taps

## Ground Thread — High Speed Steel

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Steam Oxide Finish** increases wear resistance, reduces friction, acts as a lubricant, reduces galling and chip welding, improves chip flow and increases tap lubricant retention.

**NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**

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## List No. 2068X Machine Screw Steam Oxide Finish

**STANDARD PACKAGE** All sizes — 12 each

Available in plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer)

SIZE	UNC	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NUMBER	
		UNC	UNF					PLUG	BOTTOM
6	32	—	—	3	H3	1 1/16	2	<b>32558</b>	<b>32573</b>
	—	40	—	3	H2	1 1/16	2	<b>32559</b>	<b>32574</b>
8	32	—	—	4	H3	3/4	2 1/8	<b>32560</b>	<b>32575</b>
	—	36	—	4	H2	3/4	2 1/8	<b>32561</b>	<b>32576</b>
10	24	—	—	4	H3	7/8	2 3/8	<b>32562</b>	<b>32577</b>
	—	32	—	4	H3	7/8	2 3/8	<b>32563</b>	<b>32578</b>

# Titanium Nitride (TiN) Coated Straight Flute Hand Taps

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## Ground Thread — High Speed Steel

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

## List No. 2068G — Machine Screw

**STANDARD PACKAGE** All sizes — 12 each

Available in plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer).

SIZE	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NUMBER	
	UNC	UNF					PLUG	BOTTOM.
0	—	80	2	H1	5/16	1 5/8	92460	92480
1	64	—	2	H1	3/8	1 11/16	92461	92481
	—	72	2	H1	3/8	1 11/16	92462	92482
2	56	—	3	H2	7/16	1 3/4	92463	92483
	—	64	3	H2	7/16	1 3/4	92464	92484
3	48	—	3	H2	1/2	1 13/16	92465	92485
	—	56	3	H2	1/2	1 13/16	92466	92486
4	40	—	3	H2	9/16	1 7/8	92467	92487
	—	48	3	H2	9/16	1 7/8	92468	92488
	—	36*	3	H2	9/16	1 7/8	92469	92489
5	40	—	3	H2	5/8	1 15/16	92470	92490
	—	44	3	H2	5/8	1 15/16	92471	92491
6	32	—	3	H3	11/16	2	92472	92492
	—	40	3	H2	11/16	2	92473	92493
8	32	—	4	H3	3/4	2 1/8	92474	92494
	—	36	4	H2	3/4	2 1/8	92475	92495
10	24	—	4	H3	7/8	2 3/8	92476	92496
	—	32	4	H3	7/8	2 3/8	92477	92497
12	24	—	4	H3	15/16	2 3/8	92478	92498
	—	28	4	H3	15/16	2 3/8	92479	92499

\*UNS

## SPECIAL TAPS FAST QUOTE SERVICE

Call Morse Cutting Tools for all of your special tap needs.  
To expedite your quote please provide the following information:

TAP SIZE \_\_\_\_\_ CLASS of FIT or H LIMIT \_\_\_\_\_ # of FLUTES \_\_\_\_\_

TYPE of TAP \_\_\_\_\_ SURFACE TREATMENT \_\_\_\_\_

MATERIAL to be THREADED \_\_\_\_\_ HARDNESS \_\_\_\_\_

BLIND or THROUGH HOLE \_\_\_\_\_ LENGTH of THREAD \_\_\_\_\_

# of HOLES to TAP \_\_\_\_\_ TAPPING EQUIPMENT USED \_\_\_\_\_

CURRENT TAP USED \_\_\_\_\_ TAPPING PROBLEM \_\_\_\_\_

# Straight Flute Hand Taps

Ground Thread — High Speed Steel  
Bright Finish

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

Available in sets or taper (8-10 thread chamfer), plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer)

Tool Coatings Also Available

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## List No. 2046 Fractional

**STANDARD PACKAGE** 1/4" thru 1/2" — 12 each  
9/16" thru 3/4" — 3 each  
7/8" thru 1 1/2" — 1 each  
Sets (Taper Plug Bottom)

Bold type indicates standard H limit.

SIZE	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NUMBER			
	UNC	UNF					SETS EDP NO.	TAPER	PLUG	BOTTOM
1/4	20	—	4	H1	1	2 1/2	—	<b>32301</b>	<b>32402</b>	<b>32601</b>
	20	—	4	H2	1	2 1/2	—	<b>32302</b>	<b>32404</b>	<b>32602</b>
	20	—	4	<b>H3</b>	1	2 1/2	<b>32701</b>	<b>32303</b>	<b>32407</b>	<b>32605</b>
	20	—	4	H5	1	2 1/2	—	—	<b>32409</b>	—
	—	28	4	H1	1	2 1/2	—	—	<b>32410</b>	<b>32607</b>
	—	28	4	H2	1	2 1/2	—	—	<b>32411</b>	<b>32608</b>
	—	28	4	<b>H3</b>	1	2 1/2	<b>32702</b>	<b>32304</b>	<b>32414</b>	<b>32611</b>
	—	28	4	H4	1	2 1/2	—	—	<b>32415</b>	<b>32612</b>
5/16	18	—	4	H2	1 1/8	2 23/32	—	—	<b>32418</b>	<b>32614</b>
	18	—	4	<b>H3</b>	1 1/8	2 23/32	<b>32703</b>	<b>32305</b>	<b>32421</b>	<b>32617</b>
	18	—	4	H5	1 1/8	2 23/32	—	—	<b>32422</b>	<b>32618</b>
	—	24	4	H2	1 1/8	2 23/32	—	—	<b>32424</b>	—
	—	24	4	<b>H3</b>	1 1/8	2 23/32	<b>32704</b>	<b>32306</b>	<b>32426</b>	<b>32621</b>
	—	24	4	H4	1 1/8	2 23/32	—	—	<b>32427</b>	—
3/8	16	—	4	H1	1 1/4	2 15/16	—	—	<b>32429</b>	—
	16	—	4	H2	1 1/4	2 15/16	—	—	<b>32430</b>	<b>32624</b>
	16	—	4	<b>H3</b>	1 1/4	2 15/16	<b>32705</b>	<b>32307</b>	<b>32432</b>	<b>32626</b>
	16	—	4	H5	1 1/4	2 15/16	—	—	<b>32434</b>	<b>32627</b>
	—	24	4	H1	1 1/4	2 15/16	—	—	<b>32435</b>	—
	—	24	4	H2	1 1/4	2 15/16	—	—	<b>32436</b>	<b>32629</b>
	—	24	4	<b>H3</b>	1 1/4	2 15/16	<b>32706</b>	<b>32308</b>	<b>32438</b>	<b>32631</b>
	—	24	4	H4	1 1/4	2 15/16	—	—	<b>32439</b>	—
7/16	14	—	4	<b>H3</b>	1 7/16	3 5/32	<b>32707</b>	<b>32309</b>	<b>32441</b>	<b>32633</b>
	14	—	4	H5	1 7/16	3 5/32	—	—	<b>32442</b>	<b>32634</b>
	—	20	4	<b>H3</b>	1 7/16	3 5/32	<b>32708</b>	<b>32310</b>	<b>32444</b>	<b>32635</b>
	—	20	4	H5	1 7/16	3 5/32	—	—	<b>32445</b>	<b>32636</b>
1/2	13	—	4	H1	1 21/32	3 3/8	—	—	<b>32446</b>	—
	13	—	4	<b>H3</b>	1 21/32	3 3/8	<b>32709</b>	<b>32311</b>	<b>32449</b>	<b>32640</b>
	13	—	4	H5	1 21/32	3 3/8	—	—	<b>32450</b>	<b>32641</b>
	—	20	4	H1	1 21/32	3 3/8	—	—	<b>32451</b>	<b>32642</b>
	—	20	4	<b>H3</b>	1 21/32	3 3/8	<b>32710</b>	<b>32312</b>	<b>32453</b>	<b>32643</b>
	—	20	4	H5	1 21/32	3 3/8	—	—	<b>32454</b>	—
9/16	12	—	4	<b>H3</b>	1 21/32	3 19/32	<b>32711</b>	<b>32313</b>	<b>32455</b>	<b>32644</b>
	12	—	4	H5	1 21/32	3 19/32	—	—	<b>32456</b>	—
	—	18	4	H2	1 21/32	3 19/32	—	—	<b>32457</b>	—
	—	18	4	<b>H3</b>	1 21/32	3 19/32	<b>32712</b>	<b>32314</b>	<b>32458</b>	<b>32645</b>
	—	18	4	H5	1 21/32	3 19/32	—	—	<b>32459</b>	—
5/8	11	—	4	H2	1 13/16	3 13/16	—	—	<b>32460</b>	—
	11	—	4	<b>H3</b>	1 13/16	3 13/16	<b>32713</b>	<b>32315</b>	<b>32461</b>	<b>32647</b>
	11	—	4	H5	1 13/16	3 13/16	—	—	<b>32462</b>	<b>32648</b>
	—	18	4	H2	1 13/16	3 13/16	—	—	<b>32463</b>	—
	—	18	4	<b>H3</b>	1 13/16	3 13/16	<b>32714</b>	<b>32316</b>	<b>32464</b>	<b>32649</b>
	—	18	4	H5	1 13/16	3 13/16	—	—	<b>32465</b>	<b>32650</b>

(continued)

# Straight Flute Hand Taps (continued)

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SIZE	UNC	TPI		NO. OF FLUTES	PITCH		THREAD LENGTH	OAL	EDP NUMBER			
		UNC	UNF		DIA. LIMIT	THREAD LENGTH			SETS EDP NO.	TAPER	PLUG	BOTTOM
1 <sup>1</sup> / <sub>16</sub>	—	—	—	11	4	H3	1 <sup>13</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>32</sub>	32715	32317	32466	32651
	—	—	—	16	4	H3	1 <sup>13</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>32</sub>	32716	32318	32467	32652
3/4	10	—	—	—	4	H3	2	4 <sup>1</sup> / <sub>4</sub>	32717	32319	32469	32653
	10	—	—	—	4	H5	2	4 <sup>1</sup> / <sub>4</sub>	—	—	32470	32654
	—	16	—	—	4	H1	2	4 <sup>1</sup> / <sub>4</sub>	—	—	32471	—
	—	16	—	—	4	H2	2	4 <sup>1</sup> / <sub>4</sub>	—	—	32472	—
	—	16	—	—	4	H3	2	4 <sup>1</sup> / <sub>4</sub>	32718	32320	32473	32655
	—	16	—	—	4	H5	2	4 <sup>1</sup> / <sub>4</sub>	—	—	32474	32656
7/8	9	—	—	—	4	H4	2 <sup>7</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>16</sub>	32719	32321	32475	32657
	9	—	—	—	4	H6	2 <sup>7</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>16</sub>	—	—	32476	—
	—	14	—	—	4	H2	2 <sup>7</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>16</sub>	—	—	32477	—
	—	14	—	—	4	H4	2 <sup>7</sup> / <sub>32</sub>	4 <sup>1</sup> / <sub>16</sub>	32720	32322	32478	32658
1	8	—	—	—	4	H4	2 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	32721	32323	32480	32659
	8	—	—	—	4	H6	2 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	—	—	32481	—
	—	12	—	—	4	H4	2 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	32722	32324	32482	32660
	—	—	—	14	4	H4	2 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	32723	32325	32484	32661
1 <sup>1</sup> / <sub>8</sub>	7	—	—	—	4	H4	2 <sup>9</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>16</sub>	32724	32326	32485	32662
	—	12	—	—	4	H4	2 <sup>9</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>16</sub>	32725	32327	32486	32663
1 <sup>1</sup> / <sub>4</sub>	7	—	—	—	4	H4	2 <sup>9</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	32726	32328	32487	32664
	—	12	—	—	6	H4	2 <sup>9</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	32727	32329	32488	32665
1 <sup>3</sup> / <sub>8</sub>	6	—	—	—	4	H4	3	6 <sup>1</sup> / <sub>16</sub>	32728	32330	32489	32666
	—	12	—	—	6	H4	3	6 <sup>1</sup> / <sub>16</sub>	32729	32331	32490	32667
1 <sup>1</sup> / <sub>2</sub>	6	—	—	—	4	H4	3	6 <sup>3</sup> / <sub>8</sub>	32730	32332	32491	32668
	—	12	—	—	6	H4	3	6 <sup>3</sup> / <sub>8</sub>	32731	32333	32492	32669

Taps & Dies

## Optional Flutes Straight Flute Hand Taps

Ground Thread—High Speed Steel  
Bright Finish

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Optional Flutes** taps feature fewer flutes than standard taps for added chip capacity in deeper hole tapping.

Taraud à main

Machuelo de roscar manual



List No. 2046 — Fractional

**STANDARD PACKAGE** All sizes — 12 each

SIZE	UNC	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NUMBER		
		UNC	UNF					PLUG	BOTTOM	
1/4	20	—	—	2	H3	1	2 <sup>1</sup> / <sub>2</sub>	32405	32603	
	20	—	—	3	H3	1	2 <sup>1</sup> / <sub>2</sub>	32406	32604	
	20	—	—	3	H5	1	2 <sup>1</sup> / <sub>2</sub>	32408	32606	
	—	28	—	—	2	H3	1	2 <sup>1</sup> / <sub>2</sub>	32412	32609
	—	28	—	—	3	H3	1	2 <sup>1</sup> / <sub>2</sub>	32413	32610
5/16	18	—	—	2	H3	1 <sup>1</sup> / <sub>8</sub>	2 <sup>29</sup> / <sub>32</sub>	—	32615	
	18	—	—	3	H3	1 <sup>1</sup> / <sub>8</sub>	2 <sup>29</sup> / <sub>32</sub>	32420	32616	
	—	24	—	—	3	H3	1 <sup>1</sup> / <sub>8</sub>	2 <sup>29</sup> / <sub>32</sub>	32425	32620
3/8	16	—	—	3	H3	1 <sup>1</sup> / <sub>4</sub>	2 <sup>15</sup> / <sub>16</sub>	32431	32625	
	—	24	—	—	3	H3	1 <sup>1</sup> / <sub>4</sub>	2 <sup>15</sup> / <sub>16</sub>	32437	32630
7/16	14	—	—	3	H3	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	32440	—	
	—	20	—	—	3	H3	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	32443	—
1/2	13	—	—	3	H3	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	32448	32639	
	—	20	—	—	3	H3	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	32452	—

# Titanium Nitride (TiN) Coated Straight Flute Hand Taps

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

SIZE	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.	
					PLUG	BOTTOM
1/4 - 20	H3	1	2 1/2	4	92400	92430
1/4 - 28	H3	1	2 1/2	4	92401	92431
5/16 - 18	H3	1 1/8	2 23/32	4	92402	92432
5/16 - 24	H3	1 1/8	2 23/32	4	92403	92433
3/8 - 16	H3	1 1/4	2 15/16	4	92404	92434
3/8 - 24	H3	1 1/4	2 15/16	4	92405	92435
7/16 - 14	H3	1 7/16	3 5/32	4	92406	92436
7/16 - 20	H3	1 7/16	3 5/32	4	92407	92437
1/2 - 13	H3	1 21/32	3 3/8	4	92408	92438
1/2 - 20	H3	1 21/32	3 3/8	4	92409	92439
9/16 - 12	H3	1 21/32	3 19/32	4	92410	92440
9/16 - 18	H3	1 21/32	3 19/32	4	92411	92441
5/8 - 11	H3	1 13/16	3 13/16	4	92412	92442
5/8 - 18	H3	1 13/16	3 13/16	4	92413	92443
1 1/16 - 11	H3	2	4 1/4	4	92414	92444
1 1/16 - 16	H3	2	4 1/4	4	92415	92445
3/4 - 10	H3	2	4 1/4	4	92416	92446
3/4 - 16	H3	2	4 1/4	4	92417	92447
7/8 - 9	H4	2 7/32	4 11/16	4	92418	92448
7/8 - 14	H4	2 7/32	4 11/16	4	92419	92449
1 - 8	H4	2 1/2	5 1/8	4	92420	92450
1 - 14	H4	2 1/2	5 1/8	4	92421	92451

## +.005" Oversize Straight Flute Hand Taps

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**+.005" Oversize (H11)** taps are mainly used for parts that will be plated or heat treated after tapping. Also used in materials that tend to shrink after tapping.

### List No. 2014 Machine Screw

SIZE	UNC	TPI	UNF	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.
								PLUG
6	32	—	—	H11	1 1/16	2	3	34222
8	32	—	—	H11	3/4	2 1/8	4	34223
10	24	—	—	H11	7/8	2 3/8	4	34225
10	—	—	32	H11	7/8	2 3/8	4	34226

### List No. 2014 Fractional

SIZE	UNC	TPI	UNF	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.
								PLUG
1/4	20	—	—	H11	1	2 1/2	4	34301
5/16	18	—	—	H11	1 1/8	2 23/32	4	34303
3/8	16	—	—	H11	1 1/4	2 15/16	4	34305
1/2	13	—	—	H11	1 21/32	3 3/8	4	34309
5/8	11	—	—	H11	1 13/16	3 13/16	4	34313

Taraud à main

Machuelo de roscar manual



### List No. 2046G Fractional

**STANDARD** 1/4 - 1/2 — 12 each  
**PACKAGE** 9/16 - 3/4 — 3 each  
 7/8 - 1 — 1 each

**Ground Thread - High Speed Steel**

Taraud surdimensionné

Machuelo de roscar extra grande



### List No. 2014 Machine Screw & Fractional

**STANDARD** Machine screw sizes: 12 each  
**PACKAGE** Fractional sizes: 1/4" thru 1/2" — 12 each  
 5/8" — 3 each

**Ground Thread — High Speed Steel — Plug Style  
Bright Finish**

PITCH DIA. LIMIT	AMOUNT LARGER THAN BASIC PITCH DIA.
H11	.0050"-.0055"



# Eight Pitch Straight Flute Hand Taps

Ground Thread — High Speed Steel  
Bright Finish

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Eight Pitch** taps are often required for applications in the power generation industry and general construction.

SIZE	TPI	NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NO.		
						TAPER	PLUG	BOTTOM
1	8	4	H4	2½	5⅞	32323	32480	32659
1⅛	8	4	H5	2⅞	57/16	32334	32508	32501
1¼	8	4	H5	2⅞	5¾	32336	32509	32502
1⅝	8	4	H5	3	6¼	32338	32510	32503
1½	8	6	H5	3	6⅜	32340	32511	32504
1⅞	8	6	H6	3⅜	6½	—	32512	32505
1¾	8	6	H6	3⅜	7	32344	32513	32506
17/8	8	6	H6	3⅜	7⅛	—	32514	32507
2	8	6	H6	3⅜	7⅝	32348	32515	32516
2⅛	8	6	H6	3⅜	8	34919	34925	34933
2¼	8	6	H6	3⅜	8¼	34920	34926	34934
2⅝	8	6	H6	4	8½	34921	34927	34935
2½	8	6	H6	4	8¾	34922	34928	34936
2⅝	8	6	H8	4	8¾	—	34929	34937
2¾	8	6	H8	4	9¼	34923	34930	34938
27/8	8	6	H8	4	9¼	—	34931	34939
3	8	6	H8	4⅞	9¾	34924	34932	34940

Taraud à main

Machuelo de roscar manual



List No. 2046 Fractional

STANDARD All sizes — 1 each  
PACKAGE

Available in taper (8-10 thread chamfer), plug (3-5 chamfer), or bottoming (1-2 thread chamfer)

# Surface Treated Straight Flute Hand Taps

Ground Thread — High Speed Steel

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

**Steam Oxide Finish** increases wear resistance, reduces friction, acts as a lubricant, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**

SIZE	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NO.	
	UNC	UNF					PLUG	BOTTOMING
¼	20	—	4	H3	1	2½	32520	32535
	—	28	4	H3	1	2½	32521	32536
⅝	18	—	4	H3	1⅞	2 <sup>23</sup> / <sub>32</sub>	32522	32537
	—	24	4	H3	1⅞	2 <sup>23</sup> / <sub>32</sub>	32523	32538
¾	16	—	4	H3	1¼	2 <sup>15</sup> / <sub>16</sub>	32524	32539
	—	24	4	H3	1¼	2 <sup>15</sup> / <sub>16</sub>	32525	32540
½	13	—	4	H3	1 <sup>21</sup> / <sub>32</sub>	3⅜	32526	32541
	—	20	4	H3	1 <sup>21</sup> / <sub>32</sub>	3⅜	32527	32542
⅙	12	—	4	H3	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	32532	32547
	—	18	4	H3	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	32533	32548
⅕	11	—	4	H3	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	32528	32543
	—	18	4	H3	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	32529	32544
¾	10	—	4	H3	2	4¼	32530	32545
	—	16	4	H3	2	4¼	32531	32546

Taraud à main

Machuelo de roscar manual



List No. 2046X — Fractional  
Steam Oxide Finish

STANDARD 1/4" thru 1/2" — 12 each  
PACKAGE 5/8" thru 3/4" — 3 each

Available in plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer)

# Straight Flute Hand Taps For Cast Iron

Ground Thread — High Speed Steel

Steam Oxide Over Nitride

Taps for Cast Iron feature specific geometry and a wear resistant surface finish for tapping materials that produce small or powdery chips. Recommended for cast iron, cast brass and other brass materials and non-metals that produce small or powdery chips.

Taraud à main

Machuelo de roscar manual



List No. 2021 — Machine Screw & Fractional

List No. 2021M — Metric

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes.

Available in plug (3-5 chamfer) and bottoming (1-2 thread chamfer)

## List No. 2021 Machine Screw & Fractional

SIZE	THREAD TYPE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. PLUG	EDP NO. BOTTOM
10-24	NC	H3	4	7/8	2-3/8	34870	34890
10-32	NF	H3	4	7/8	2-3/8	34871	34891
1/4-20	NC	H3	4	1	2-1/2	34872	34892
1/4-28	NF	H3	4	1	2-1/2	34873	34893
5/16-18	NC	H3	4	1-1/8	2-23/32	34874	34894
5/16-24	NF	H3	4	1-1/8	2-23/32	34875	34895
3/8-16	NC	H3	4	1-1/4	2-15/16	34876	34896
3/8-24	NF	H3	4	1-1/4	2-15/16	34877	34897
7/16-14	NC	H3	4	1-7/16	3-5/32	34878	34898
7/16-20	NF	H3	4	1-7/16	3-5/32	34879	34899
1/2-13	NC	H3	4	1-21/32	3-3/8	34880	34900
1/2-20	NF	H3	4	1-21/32	3-3/8	34881	34901
9/16-12	NC	H3	4	1-21/32	3-19/32	34882	34902
9/16-18	NF	H3	4	1-21/32	3-19/32	34883	34903
5/8-11	NC	H3	4	1-13/16	3-13/16	34884	34904
5/8-18	NF	H3	4	1-13/16	3-13/16	34885	34905
3/4-10	NC	H3	4	2	4-1/4	34886	34906
3/4-16	NF	H3	4	2	4-1/4	34887	34907

## List No. 2021M Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. PLUG	EDP NO. BOTTOM
M6	1	D5	4	1	2-1/2	34910	34915
M8	1.25	D5	4	1-1/8	2-23/32	34911	34916
M10	1.5	D6	4	1-1/4	2-15/16	34912	34917
M12	1.75	D6	4	1-21/32	3-3/8	34913	34918

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Metric Straight Flute Hand Taps

Ground Thread — High Speed Steel  
Bright Finish

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes or blind holes in a wide variety of materials.

Available in sets or taper (8-10 thread chamfer), plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer).

Taraud à main

Machuelo de roscar manual



List No. 7500

**STANDARD PACKAGE** M1.6 thru M12 — 12 each  
M14 thru M16 — 3 each  
M18 thru M39 — 1 each  
Sets (Taper, Plug, Bottom)

SIZE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	SETS		EDP NO.	
					EDP NO.	TAPER	PLUG	BOTTOM
M1.6 x 0.35	D3	2	5/16	1 5/8	38200	38141	38016	38116
M1.8 x 0.35	D3	2	3/8	1 11/16	38201	38142	38017	38117
M2 x 0.4	D3	3	7/16	1 3/4	38203	38143	38018	38118
M2.2 x 0.45	D3	3	7/16	1 3/4	38204	38144	38019	38119
M2.5 x 0.45	D3	3	1/2	1 13/16	38205	38145	38001	38101
M3 x 0.5	D3	3	5/8	1 15/16	38206	38146	38002	38102
M3.5 x 0.6	D4	3	1 1/16	2	38207	38147	38003	38103
M4 x 0.7	D4	4	3/4	2 1/8	38208	38148	38004	38104
M4.5 x 0.75	D4	4	7/8	2 3/8	38209	38149	38005	38105
M5 x 0.8	D4	4	7/8	2 3/8	38210	38150	38006	38106
M6 x 1	D5	4	1	2 1/2	38211	38151	38007	38107
M7 x 1	D5	4	1 1/8	2 23/32	38212	38152	38008	38108
M8 x 1	D5	4	1 1/8	2 23/32	38213	38153	38020	38120
*M8 x 1.25	D5	4	1 1/8	2 23/32	38214	38154	38009	38109
M10 x 1.25	D5	4	1 1/4	2 15/16	38215	38155	38021	38121
*M10 x 1.5	D6	4	1 1/4	2 15/16	38216	38156	38010	38110
M12 x 1.25	D5	4	1 21/32	3 3/8	38217	38157	38022	38122
*M12 x 1.75	D6	4	1 21/32	3 3/8	38218	38158	38011	38111
M14 x 1.5	D6	4	1 21/32	3 19/32	38219	38159	38023	38123
*M14 x 2	D7	4	1 21/32	3 19/32	38220	38160	38012	38112
M16 x 1.5	D6	4	1 13/16	3 13/16	38221	38161	38024	38124
*M16 x 2	D7	4	1 13/16	3 13/16	38222	38162	38013	38113
M18 x 1.5	D6	4	1 13/16	4 1/32	38223	38163	38025	38125
*M18 x 2.5	D7	4	1 13/16	4 1/32	38224	38164	38014	38114
M20 x 1.5	D6	4	2	4 15/32	38225	38165	38026	38126
*M20 x 2.5	D7	4	2	4 15/32	38226	38166	38015	38115
M22 x 1.5	D6	4	2 7/32	4 11/16	38227	38167	38027	38127
*M22 x 2.5	D7	4	2 7/32	4 11/16	38228	38168	38028	38128
M24 x 2	D7	4	2 7/32	4 29/32	38229	38169	38029	38129
*M24 x 3	D8	4	2 7/32	4 29/32	38230	38170	38030	38130
M27 x 2	D7	4	2 1/2	5 1/8	38231	38171	38031	38131
*M27 x 3	D8	4	2 1/2	5 1/8	38232	38172	38032	38132
M30 x 2	D7	4	2 9/16	5 7/16	38233	38173	38033	38133
*M30 x 3.5	D9	4	2 9/16	5 7/16	38234	38174	38034	38134
M33 x 2	D7	6	2 9/16	5 3/4	38238	38178	38038	38138
*M33 x 3.5	D9	4	2 9/16	5 3/4	—	—	38035	—
M36 x 3	D8	4	3	6 1/16	38236	38176	38036	38136
*M36 x 4	D9	4	3	6 1/16	38237	38177	38037	38137

Pitch diameters are those recommended for 6H class of thread.

\*Designates course pitch

# Spiral Point Plug Taps

## Ground Thread — High Speed Steel

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**Steam Oxide Finish** increases wear resistance, reduces friction, acts as a lubricant, reduces galling and chip welding. Improves chip flow and increases tap lubricant retention. **NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**

Taraud à entrée hélicoïdale

Machuelo con punta en espiral



List No. 2070 Machine Screw  
Bright Finish



List No. 2070X Machine Screw  
Steam Oxide Finish

STANDARD  
PACKAGE

All sizes — 12 each

Bold type indicates standard H limit.

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	2070	2070X
	UNC	UNF					EDP NO.	EDP NO.
0	—	80	H1	5/16	1 5/8	2	34001	—
	—	80	<b>H2</b>	5/16	1 5/8	2	34002	34122
1	64	—	H1	3/8	1 1/16	2	34003	—
	64	—	<b>H2</b>	3/8	1 1/16	2	34004	—
	—	72	H1	3/8	1 1/16	2	34005	—
	—	72	<b>H2</b>	3/8	1 1/16	2	34006	34126
2	56	—	<b>H2</b>	7/16	1 3/4	2	34008	34127
	—	64	<b>H2</b>	7/16	1 3/4	2	34010	—
3	48	—	<b>H2</b>	1/2	1 3/16	2	34012	34129
	—	56	H1	1/2	1 3/16	2	34013	—
	—	56	<b>H2</b>	1/2	1 3/16	2	34014	34131
4	40	—	H1	9/16	1 7/8	2	34015	34132
	40	—	<b>H2</b>	9/16	1 7/8	2	34016	34133
	—	48	H1	9/16	1 7/8	2	34017	—
	—	48	<b>H2</b>	9/16	1 7/8	2	34018	—
	—	*36	<b>H2</b>	9/16	1 7/8	2	34019	34134
5	40	—	H1	5/8	1 5/16	2	34020	—
	40	—	<b>H2</b>	5/8	1 5/16	2	34021	34136
	—	44	<b>H2</b>	5/8	1 5/16	2	34022	—
6	32	—	H1	11/16	2	2	34023	—
	32	—	H2	11/16	2	2	34024	34137
	32	—	<b>H3</b>	11/16	2	2	34025	34138
	—	40	<b>H2</b>	11/16	2	2	34026	34139
8	32	—	H1	3/4	2 1/8	2	34027	—
	32	—	H2	3/4	2 1/8	2	34028	34140
	32	—	<b>H3</b>	3/4	2 1/8	2	34029	34141
	—	36	<b>H2</b>	3/4	2 1/8	2	34030	34142
10	24	—	H1	7/8	2 3/8	2	34031	—
	24	—	H2	7/8	2 3/8	2	34032	34143
	24	—	<b>H3</b>	7/8	2 3/8	2	34033	34144
	—	32	H1	7/8	2 3/8	2	34034	—
	—	32	H2	7/8	2 3/8	2	34035	34145
	—	32	<b>H3</b>	7/8	2 3/8	2	34036	34146
12	24	—	<b>H3</b>	15/16	2 3/8	2	34038	34147
	—	28	<b>H3</b>	15/16	2 3/8	2	34039	34148

\*UNS

Tool Coatings Also Available

# Titanium Nitride (TiN) Coated Spiral Point Plug Taps

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

SIZE	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.
0-80	H2	5/16	1 5/8	2	92520
1-64	H2	3/8	1 11/16	2	92521
2-56	H2	7/16	1 3/4	2	92522
2-64	H2	7/16	1 3/4	2	92523
3-48	H2	1/2	1 13/16	2	92524
3-56	H2	1/2	1 13/16	2	92525
4-40	H2	9/16	1 7/8	2	92526
4-48	H2	9/16	1 7/8	2	92527
5-40	H2	5/8	1 15/16	2	92528
5-44	H2	5/8	1 15/16	2	92529
6-32	H3	11/16	2	2	92530
6-40	H2	11/16	2	2	92531
8-32	H3	3/4	2 1/8	2	92532
8-36	H2	3/4	2 1/8	2	92533
10-24	H3	7/8	2 3/8	2	92534
10-32	H3	7/8	2 3/8	2	92535
12-24	H3	15/16	2 3/8	2	92536
12-28	H3	15/16	2 3/8	2	92537

# +.005" Oversize Spiral Point Plug Taps

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**+.005" Oversize (H11)** taps are mainly used for parts that will be plated or heat treated after tapping. Also used in materials that tend to shrink after tapping

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.
	UNC	UNF					
6	32	—	H11	1 1/16	2	2	34241
8	32	—	H11	3/4	2 1/8	2	34243
10	24	—	H11	7/8	2 3/8	2	34244
10	—	32	H11	7/8	2 3/8	2	34245
1/4	20	—	H11	1	2 1/2	2	34251
5/16	18	—	H11	1 1/8	2 23/32	2	34253
3/8	16	—	H11	1 1/4	2 15/16	3	34255
1/2	13	—	H11	1 21/32	3 3/8	3	34259
5/8	11	—	H11	1 19/16	3 13/16	3	34263

Taraud à entrée hélicoïdale  
Machuelo con punta en espiral



List No. 2070G Machine Screw

Ground Thread - High Speed Steel

STANDARD PACKAGE. All sizes — 12 each

Taraud surdimensionné Machuelo de roscar extra grande



List No. 2015 Machine Screw & Fractional

Ground Thread — High Speed Steel

Bright Finish

STANDARD PACKAGE Machine screw sizes: All sizes — 12 each  
Fractional sizes:  
1/4" thru 1/2" — 12 each  
5/8" — 3 each

PITCH DIA. LIMIT	AMOUNT LARGER THAN BASIC PITCH DIA.
H11	.0050"-.0055"

# Spiral Point Plug Taps

## Ground Thread — High Speed Steel

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**Steam Oxide Finish** increases wear resistance reduces friction, acts as a lubricant, reduces galling and chip welding, improves chip flow and increases tap lubricant retention. **NOT RECOMMENDED FOR NON-FERROUS MATERIALS.**

Taraud à entrée hélicoïdale

Machuelo con punta en espiral



List No. 2047 Fractional  
Bright Finish



List No. 2047X Fractional  
Steam Oxide Finish

**STANDARD** 1/4" thru 1/2" — 12 each  
**PACKAGE** 9/16" thru 3/4" — 3 each

Bold type indicates standard H limit.

SIZE	TPI		NO. OF FLUTES		PITCH DIA. LIMIT	THREAD LENGTH	OAL	2047 EDP NO.	2047X EDP NO.	
	UNC	UNF	STD.	OPTL.						
1/4	20	—	2	—	H1	1	2 1/2	<b>33001</b>	—	
	20	—	2	—	H2	1	2 1/2	<b>33002</b>	<b>33055</b>	
	20	—	2	—	<b>H3</b>	1	2 1/2	<b>33003</b>	<b>33056</b>	
	20	—	2	—	H5	1	2 1/2	<b>33004</b>	<b>33057</b>	
	20	—	—	3	—	<b>H3</b>	1	2 1/2	<b>33005</b>	—
	20	—	—	3	—	H5	1	2 1/2	<b>33006</b>	—
1/4	—	28	2	—	H1	1	2 1/2	<b>33007</b>	—	
	—	28	2	—	H2	1	2 1/2	<b>33008</b>	<b>33058</b>	
	—	28	2	—	<b>H3</b>	1	2 1/2	<b>33009</b>	<b>33059</b>	
	—	28	2	—	H4	1	2 1/2	<b>33010</b>	<b>33060</b>	
	—	28	—	3	—	H2	1	2 1/2	<b>33011</b>	—
	—	28	—	3	—	H4	1	2 1/2	<b>33012</b>	—
5/16	18	—	2	—	H1	1 1/8	2 23/32	<b>33013</b>	—	
	18	—	2	—	H2	1 1/8	2 23/32	<b>33014</b>	—	
	18	—	2	—	<b>H3</b>	1 1/8	2 23/32	<b>33015</b>	<b>33061</b>	
	18	—	2	—	H5	1 1/8	2 23/32	<b>33016</b>	<b>33062</b>	
	18	—	—	3	—	<b>H3</b>	1 1/8	2 23/32	<b>33017</b>	<b>33063</b>
	18	—	—	3	—	H5	1 1/8	2 23/32	<b>33018</b>	<b>33064</b>
5/16	—	24	2	—	H1	1 1/8	2 23/32	<b>33019</b>	—	
	—	24	2	—	H2	1 1/8	2 23/32	<b>33020</b>	<b>33065</b>	
	—	24	2	—	<b>H3</b>	1 1/8	2 23/32	<b>33021</b>	<b>33066</b>	
	—	24	2	—	H4	1 1/8	2 23/32	<b>33022</b>	—	
	—	24	—	3	—	H2	1 1/8	2 23/32	<b>33023</b>	—
	—	24	—	3	—	H4	1 1/8	2 23/32	<b>33024</b>	<b>33067</b>
3/8	16	—	3	—	H1	1 1/4	2 15/16	<b>33025</b>	—	
	16	—	3	—	H2	1 1/4	2 15/16	<b>33026</b>	—	
	16	—	3	—	<b>H3</b>	1 1/4	2 15/16	<b>33027</b>	<b>33068</b>	
	16	—	3	—	H5	1 1/4	2 15/16	<b>33028</b>	<b>33069</b>	
3/8	—	24	3	—	H1	1 1/4	2 15/16	<b>33029</b>	—	
	—	24	3	—	H2	1 1/4	2 15/16	<b>33030</b>	—	
	—	24	3	—	<b>H3</b>	1 1/4	2 15/16	<b>33031</b>	<b>33070</b>	
	—	24	3	—	H4	1 1/4	2 15/16	<b>33032</b>	—	
7/16	14	—	3	—	H2	1 7/16	3 5/32	<b>33033</b>	—	
	14	—	3	—	<b>H3</b>	1 7/16	3 5/32	<b>33034</b>	<b>33071</b>	
	14	—	3	—	H5	1 7/16	3 5/32	<b>33035</b>	<b>33072</b>	
7/16	—	20	3	—	<b>H3</b>	1 7/16	3 5/32	<b>33036</b>	<b>33073</b>	
	—	20	3	—	H5	1 7/16	3 5/32	<b>33037</b>	<b>33074</b>	
1/2	13	—	3	—	H2	1 21/32	3 3/8	<b>33039</b>	—	
	13	—	3	—	<b>H3</b>	1 21/32	3 3/8	<b>33040</b>	<b>33075</b>	
	13	—	3	—	H5	1 21/32	3 3/8	<b>33041</b>	<b>33076</b>	
1/2	—	20	3	—	H1	1 21/32	3 3/8	<b>33042</b>	—	
	—	20	3	—	H2	1 21/32	3 3/8	<b>33043</b>	—	
	—	20	3	—	<b>H3</b>	1 21/32	3 3/8	<b>33044</b>	<b>33077</b>	
	—	20	3	—	H5	1 21/32	3 3/8	<b>33045</b>	<b>33078</b>	
5/8	11	—	3	—	<b>H3</b>	1 13/16	3 13/16	<b>33046</b>	<b>33079</b>	
	11	—	3	—	H5	1 13/16	3 13/16	<b>33047</b>	<b>33080</b>	
	—	18	3	—	<b>H3</b>	1 13/16	3 13/16	<b>33050</b>	<b>33081</b>	
3/4	10	—	3	—	<b>H3</b>	2	4 1/4	<b>33048</b>	<b>33082</b>	
	10	—	3	—	H5	2	4 1/4	<b>33049</b>	<b>33083</b>	
	—	16	3	—	<b>H3</b>	2	4 1/4	<b>33052</b>	<b>33084</b>	

# Titanium Nitride (TiN) Coated Spiral Point Plug Taps

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

SIZE	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.
1/4-20	H3	1	2 1/2	2	92500
1/4-28	H3	1	2 1/2	2	92501
5/16-18	H3	1 1/8	2 23/32	2	92502
5/16-24	H3	1 1/8	2 23/32	2	92503
3/8-16	H3	1 1/4	2 15/16	3	92504
3/8-24	H3	1 1/4	2 15/16	3	92505
7/16-14	H3	1 7/16	3 5/32	3	92506
7/16-20	H3	1 7/16	3 5/32	3	92507
1/2-13	H3	1 21/32	3 3/8	3	92508
1/2-20	H3	1 21/32	3 3/8	3	92509
5/8-11	H3	1 13/16	3 13/16	3	92510
5/8-18	H3	1 13/16	3 13/16	3	92511
3/4-10	H3	2	4 1/4	3	92512
3/4-16	H3	2	4 1/4	3	92513

Taraud à entrée hélicoïdale  
Machuelo con punta en espiral



List No. 2047G Fractional

Ground Thread – High Speed Steel

STANDARD 1/4 - 1/2 — 12 each  
PACKAGE 5/8 - 3/4 — 3 each

# Spiral Point Bottoming Taps

**Spiral Point Bottoming** taps are designed for machine tapping in blind holes with adequate chip space at the bottom of the hole. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds. Recommended for a wide range of materials.

Taraud à entrée hélicoïdale Machuelo con punta en espiral



List No. 2047 Fractional

List No. 2070 Machine Screw

STANDARD All sizes — 12 each  
PACKAGE

Ground Thread — High Speed Steel  
Bright Finish

SIZE	UNC	TPI	UNF	NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	EDP NO.
0	—	80	80	2	H2	5/16	1 5/8	34101
2	56	—	56	2	H2	7/16	1 3/4	34102
3	48	—	48	2	H2	1/2	1 13/16	34103
4	40	—	40	2	H2	9/16	1 7/8	34104
	—	—	48	2	H2	9/16	1 7/8	34105
5	40	—	40	2	H2	5/8	1 15/16	34106
6	32	—	32	2	H2	11/16	2	34107
	32	—	32	2	H3	11/16	2	34108
	—	—	40	2	H2	11/16	2	34109
8	32	—	32	2	H2	3/4	2 1/8	34110
8	32	—	32	2	H3	3/4	2 1/8	34111
10	24	—	24	2	H2	7/8	2 3/8	34112
	24	—	24	2	H3	7/8	2 3/8	34113
	—	—	32	2	H2	7/8	2 3/8	34114
	—	—	32	2	H3	7/8	2 3/8	34115
12	24	—	24	2	H3	15/16	2 3/8	34116
1/4	20	—	20	2	H3	1	2 1/2	33101
	—	—	28	2	H3	1	2 1/2	33102
5/16	18	—	18	2	H3	1 1/8	2 23/32	33103
	—	—	24	2	H3	1 1/8	2 23/32	33104

# Metric Spiral Point Plug Taps

## Ground Thread — High Speed Steel

**Spiral Point** taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.

**STANDARD** M1.6 thru M12 — 12 each  
**PACKAGE** M14 thru M16 — 3 each  
 M18 thru M20 — 1 each

Taraud à entrée hélicoïdale

Machuelo con punta en espiral



List No. 7501 Bright Finish



List No. 7501G TiN Coated

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

SIZE	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	7501 EDP NO.	7501G EDP NO.
M1.6 × 0.35	D3	5/16	1 5/8	2	38516	98516
M1.8 × 0.35	D3	3/8	1 11/16	2	38517	98517
M2 × 0.4	D3	7/16	1 3/4	2	38518	98518
M2.2 × 0.45	D3	7/16	1 3/4	2	38519	98519
M2.5 × 0.45	D3	1/2	1 13/16	2	38501	98501
M3 × 0.5	D3	5/8	1 15/16	2	38502	98502
M3.5 × 0.6	D4	11/16	2	2	38503	98503
M4 × 0.7	D4	3/4	2 1/8	2	38504	98504
M4.5 × 0.75	D4	7/8	2 3/8	2	38505	98505
M5 × 0.8	D4	7/8	2 3/8	2	38506	98506
M6 × 1	D5	1	2 1/2	2	38507	98507
M7 × 1	D5	1 1/8	2 23/32	2	38508	98508
M8 × 1	D5	1 1/8	2 23/32	2	38520	98520
M8 × 1.25*	D5	1 1/8	2 23/32	2	38509	98509
M10 × 1.25	D5	1 1/4	2 15/16	3	38521	98521
M10 × 1.5*	D6	1 1/4	2 15/16	3	38510	98510
M12 × 1.25	D5	1 21/32	3 3/8	3	38522	98522
M12 × 1.75*	D6	1 21/32	3 3/8	3	38511	98511
M14 × 1.5	D6	1 21/32	3 19/32	3	38523	98523
M14 × 2*	D7	1 21/32	3 19/32	3	38512	98512
M16 × 1.5	D6	1 13/16	3 13/16	3	38524	98524
M16 × 2*	D7	1 13/16	3 13/16	3	38513	98513
M18 × 2.5	D7	1 9/16	4 1/32	3	38514	98514
M20 × 2.5	D7	2	4 15/32	3	38515	98515

Pitch diameters are those recommended for 6H class of thread

\* Designates Course Pitch

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon



# Slow Spiral Spiral Flute Taps

Taraud à gorges hélicoïdales

Machuelo de roscar con gavilanes en espiral



Ground Thread — High Speed Steel  
30° Helix Angle  
Bright Finish

**Spiral Flute** taps lift the chips out of the hole in blind hole tapping, eliminating chip disposal problems, damaged threads and broken taps. They will also bridge interruptions in the tapped hole. **Slow Spiral** taps have a stronger cutting edge (less susceptible to chipping) than Fast Spiral taps and are recommended for general purpose applications.

List No. 2063 Machine Screw  
List No. 2039 Fractional

STANDARD PACKAGE All sizes — 12 each

## List No. 2063 Machine Screw

SIZE	TPI		NO. OF FLUTES		PITCH DIA. LIMIT	THREAD LENGTH	OAL	PLUG EDP NO.	BOTTOM EDP NO.
	UNC	UNF	STD.	OPTL.					
4	40	—	2	—	H2	9/16	1 7/8	33401	33426
5	40	—	2	—	H2	5/8	1 15/16	33402	33427
6	32	—	2	—	H3	1 1/16	2	33403	33428
8	32	—	2	—	H3	3/4	2 1/8	33404	33429
10	24	—	2	—	H3	7/8	2 3/8	33405	33430
10	—	32	2	—	H3	7/8	2 3/8	33406	33431

## List No. 2039 Fractional

SIZE	TPI		NO. OF FLUTES		PITCH DIA. LIMIT	THREAD LENGTH	OAL	PLUG EDP NO.	BOTTOM EDP NO.
	UNC	UNF	STD.	OPTL.					
1/4	20	—	2	—	H3	1	2 1/2	32121	—
	—	28	2	—	H3	1	2 1/2	32123	32152
	—	28	—	3	H3	1	2 1/2	—	32153*
5/16	18	—	3	—	H3	1 1/8	2 23/32	32125	32154
	—	24	3	—	H3	1 1/8	2 23/32	32126	32155
3/8	16	—	3	—	H3	1 1/4	2 15/16	32127	32156
	—	24	3	—	H3	1 1/4	2 15/16	32128	32157
1/2	13	—	3	—	H3	1 21/32	3 3/8	32130	32159
	—	20	3	—	H3	1 21/32	3 3/8	32131	—

\*Available While Supplies Last

# Fast Spiral Spiral Flute Taps

Taraud à gorges hélicoïdales

Machuelo de roscar con gavilanes en espiral



Ground Thread — High Speed Steel  
52° Helix Angle  
Bright Finish

**Spiral Flute** taps lift the chips out of the hole in blind hole tapping, eliminating chip disposal problems, damaged threads and broken taps. They will also bridge interruptions in the tapped hole. **Fast Spiral** taps provide enhanced chip lifting action, will bridge wider interruptions and have a freer-cutting geometry. Recommended for softer materials that produce stringy chips.

List No. 2059 Machine Screw & Fractional

STANDARD PACKAGE All sizes — 12 each

Tool Coatings  
Also Available

## List No. 2059 Machine Screw

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	PLUG EDP NO.	BOTTOM EDP NO.
	UNC	UNF						
3	48	—	H2	1/2	1 13/16	2	33201*	33251*
4	40	—	H2	9/16	1 7/8	2	33203	33253
5	40	—	H2	5/8	1 15/16	2	33205	33255
6	32	—	H3	1 1/16	2	2	33208	33258
8	32	—	H2	3/4	2 1/8	3	33210	—
8	32	—	H3	3/4	2 1/8	3	33211	33261
10	24	—	H3	7/8	2 3/8	3	33214	33264
10	—	32	H3	7/8	2 3/8	3	33216	33266
12	24	—	H3	15/16	2 3/8	3	33217	33267

\*Available While Supplies Last

(continued)

# Fast Spiral Spiral Flute Taps (continued)

Taraud à gorges hélicoïdales

Machuelo de roscar con gavilanes en espiral

## List No. 2059 Fractional

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF FLUTES	PLUG EDP NO.	BOTTOM EDP NO.
	UNC	UNF						
1/4	20	—	H3	1	2 1/2	3	33302	33352
	—	28	H3	1	2 1/2	3	33305	33355
5/16	18	—	H3	1 1/8	2 23/32	3	33307	33357
	—	24	H3	1 1/8	2 23/32	3	33309	33359
3/8	16	—	H3	1 1/4	2 15/16	3	33311	33361
	—	24	H3	1 1/4	2 15/16	3	33313	33363
7/16	14	—	H3	1 7/16	3 5/32	3	33314	33364
	—	20	H3	1 7/16	3 5/32	3	33315	33365
1/2	13	—	H3	1 21/32	3 3/8	3	33316	33366
	—	20	H3	1 21/32	3 3/8	3	33317	33367

## Left Hand Straight Flute Hand Taps

Ground Thread — High Speed Steel

Bright Finish

Left Hand taps are left hand cutting for producing left hand threads in a wide variety of materials.

Taraud à main

Machuelo de roscar manual



## List No. 2020

**STANDARD PACKAGE** #6 thru 1/2" — 12 each  
5/8" thru 3/4" — 3 each  
7/8" thru 1" — 1 each

Available in plug (3-5 thread chamfer), or bottoming (1-2 thread chamfer)

SIZE	TPI		NO. OF FLUTES	PITCH DIA. LIMIT	THREAD LENGTH	OAL	PLUG EDP NO.	BOTTOM EDP NO.
	UNC	UNF						
10	24	—	4	H3	7/8	2 3/8	33440	33470
	—	32	4	H3	7/8	2 3/8	33441	33471
1/4	20	—	4	H3	1	2 1/2	33442	33472
	—	28	4	H3	1	2 1/2	33443	33473
5/16	18	—	4	H3	1 1/8	2 23/32	33444	33474
	—	24	4	H3	1 1/8	2 23/32	33445	33475
3/8	16	—	4	H3	1 1/4	2 15/16	33446	33476
	—	24	4	H3	1 1/4	2 15/16	33447	33477
7/16	14	—	4	H3	1 7/16	3 5/32	33448	33478
	—	20	4	H3	1 7/16	3 5/32	33449	33479
1/2	13	—	4	H3	1 21/32	3 3/8	33450	33480
	—	20	4	H3	1 21/32	3 3/8	33451	33481
5/8	11	—	4	H3	1 13/16	3 13/16	33452	33482
	—	18	4	H3	1 13/16	3 13/16	33453	33483
3/4	10	—	4	H3	2	4 1/4	33454	33484
	—	16	4	H3	2	4 1/4	33455	33485
7/8	9	—	4	H4	2 7/32	4 11/16	33456	33486
	—	14	4	H4	2 7/32	4 11/16	33457	33487
1	8	—	4	H4	2 1/2	5 1/8	33458	33488
	—	12	4	H4	2 1/2	5 1/8	33459	33489
	—	14**	4	H4	2 1/2	5 1/8	33460	33490

\*\* UNS

Tool Coatings Also Available

# Thread Forming Taps

## Ground Thread — High Speed Steel

**Thread Forming** taps cold form rather than cut the threads. Advantages include no chips to dispose of, stronger higher quality threads, increased tapping speeds, longer tap life and reduced tap breakage. Recommended for a wide variety of ductile materials.

**Lube Grooves** provide a path for lubrication and act as vents to relieve pressure in blind hole tapping.

**Plug Style** (4 threads tapered) for through holes and blind holes with adequate depth. The longer taper lead is easier starting, requires less torque, produces less burr above the mouth of the tapped hole and increases tool life.

**Bottoming Style** (2 threads tapered) for blind holes.

**Titanium Nitride (TiN) Coating** results in an extremely hard surface with high lubricity for increased tool life, improved thread quality, reduced torque and increased tapping speeds for greater productivity.

Taraud façonneur de filets

Machuelo formador de roscas



**Tool Coatings  
Also Available**

**List No. 2105 Bright Finish**  
**List No. 2105G TiN Coated**

**NOTE:** Thread forming taps require a larger **tap drill size** than cutting taps because the material flows during the thread forming process. It may be necessary to experiment to determine the required hole size to produce a specific percent of thread. **Countersinking** before tapping is recommended because the forming process usually displaces material above the mouth of the tapped hole.

**STANDARD PACKAGE** No. 0 thru 1/2" — 12 each  
3/16" thru 3/4" — 3 each  
M3 thru M12 — 12 each  
M14 thru M16 — 3 each  
M18 thru M24 — 1 each

TAP DRILL SIZES:  
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## Machine Screw

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF LUBE GROOVES	PLUG		BOTTOM	
	UNC	UNF					BRIGHT EDP NO.	TIN COATED EDP NO.	BRIGHT EDP NO.	TIN COATED EDP NO.
0	80	—	H2	5/16	15/8	1	—	—	36370	96370
1	64	—	H2	3/8	11/16	1	—	—	36371	96371
		72	H2	3/8	11/16	1	—	—	36372	96372
2	56	—	H2	7/16	13/4	1	—	—	36373	96373
		—	H3	7/16	13/4	1	—	—	36374	96374
	—	64	H2	7/16	13/4	1	—	—	36375	96375
		64	H3	7/16	13/4	1	—	—	36376	96376
3	48	—	H2	1/2	13/16	1	—	—	36377	96377
		—	H3	1/2	13/16	1	—	—	36378	96378
	—	56	H2	1/2	13/16	1	—	—	36379	96379
		56	H3	1/2	13/16	1	—	—	36380	96380
4	40	—	H3	9/16	17/8	3	36281	96281	36381	96381
		—	H5	9/16	17/8	3	36282	96282	36382	96382
	—	48	H3	9/16	17/8	3	36283	96283	36383	96383
		48	H5	9/16	17/8	3	36284	96284	36384	96384
5	40	—	H3	5/8	15/16	3	36285	96285	36385	96385
		—	H5	5/8	15/16	3	36286	96286	36386	96386
	—	44	H3	5/8	15/16	3	36287	96287	36387	96387
		44	H5	5/8	15/16	3	36288	96288	36388	96388
6	32	—	H3	11/16	2	3	36289	96289	36389	96389
		—	H5	11/16	2	3	36290	96290	36390	96390
	—	40	H3	11/16	2	3	36291	96291	36391	96391
		40	H5	11/16	2	3	36292	96292	36392	96392
8	32	—	H3	3/4	21/8	3	36293	96293	36393	96393
		—	H5	3/4	21/8	3	36294	96294	36394	96394
	—	36	H3	3/4	21/8	3	36295	96295	36395	96395
		36	H5	3/4	21/8	3	36296	96296	36396	96396
10	24	—	H4	7/8	23/8	4	36297	96297	36397	96397
		—	H6	7/8	23/8	4	36298	96298	36398	96398
	—	32	H4	7/8	23/8	4	36299	96299	36399	96399
		32	H6	7/8	23/8	4	36300	96300	36400	96400
12	24	—	H4	15/16	23/8	4	36301	96301	36401	96401
		—	H6	15/16	23/8	4	36302	96302	36402	96402
	—	28	H4	15/16	23/8	4	36303	96303	36403	96403
		28	H6	15/16	23/8	4	36304	96304	36404	96404

# Thread Forming Taps

Taraud façonneur de filets

Machuelo formador de roscas

## Fractional

Taps & Dies

SIZE	TPI		PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF LUBE GROOVES	PLUG		BOTTOM	
	UNC	UNF					BRIGHT EDP NO.	TIN COATED EDP NO.	BRIGHT EDP NO.	TIN COATED EDP NO.
1/4	20	—	H4	1	2½	4	36310	96310	36410	96410
	20	—	H6	1	2½	4	36311	96311	36411	96411
	—	28	H4	1	2½	4	36312	96312	36412	96412
	—	28	H6	1	2½	4	36313	96313	36413	96413
5/16	18	—	H5	1½	2 <sup>23</sup> / <sub>32</sub>	4	36314	96314	36414	96414
	18	—	H7	1½	2 <sup>23</sup> / <sub>32</sub>	4	36315	96315	36415	96415
	—	24	H5	1½	2 <sup>23</sup> / <sub>32</sub>	4	36316	96316	36416	96416
	—	24	H7	1½	2 <sup>23</sup> / <sub>32</sub>	4	36317	96317	36417	96417
3/8	16	—	H5	1¼	2 <sup>15</sup> / <sub>16</sub>	4	36318	96318	36418	96418
	16	—	H7	1¼	2 <sup>15</sup> / <sub>16</sub>	4	36319	96319	36419	96419
	—	24	H5	1¼	2 <sup>15</sup> / <sub>16</sub>	4	36320	96320	36420	96420
	—	24	H7	1¼	2 <sup>15</sup> / <sub>16</sub>	4	36321	96321	36421	96421
7/16	14	—	H5	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	4	36322	96322	36422	96422
	14	—	H8	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	4	36323	96323	36423	96423
	—	20	H5	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	4	36324	96324	36424	96424
	—	20	H8	1 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>32</sub>	4	36325	96325	36425	96425
1/2	13	—	H5	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	4	36326	96326	36426	96426
	13	—	H8	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	4	36327	96327	36427	96427
	—	20	H5	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	4	36328	96328	36428	96428
	—	20	H8	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	4	36329	96329	36429	96429
9/16	12	—	H7	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	6	36330	96330	36430	96430
	12	—	H10	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	6	36331	96331	36431	96431
	—	18	H7	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	6	36332	96332	36432	96432
	—	18	H10	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	6	36333	96333	36433	96433
5/8	11	—	H7	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	6	36334	96334	36434	96434
	11	—	H10	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	6	36335	96335	36435	96435
	—	18	H7	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	6	36336	96336	36436	96436
	—	18	H10	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	6	36337	96337	36437	96437
3/4	10	—	H7	2	4¼	6	36338	96338	36438	96438
	10	—	H10	2	4¼	6	36339	96339	36439	96439
	—	16	H7	2	4¼	6	36340	96340	36440	96440
	—	16	H10	2	4¼	6	36341	96341	36441	96441

Tool Coatings Also Available

## Metric

SIZE	PITCH	PITCH DIA. LIMIT	THREAD LENGTH	OAL	NO. OF LUBE GROOVES	PLUG		BOTTOM	
						BRIGHT EDP NO.	TIN COATED EDP NO.	BRIGHT EDP NO.	TIN COATED EDP NO.
M3	0.5	D5	5/8	1 <sup>15</sup> / <sub>16</sub>	3	36350	96350	36450	96450
M4	0.7	D6	3/4	2½	3	36351	96351	36451	96451
M5	0.8	D7	7/8	2 <sup>3</sup> / <sub>8</sub>	4	36352	96352	36452	96452
M6	1	D8	1	2½	4	36353	96353	36453	96453
M8	1.25	D9	1½	2 <sup>23</sup> / <sub>32</sub>	4	36354	96354	36454	96454
M10	1.5	D10	1¼	2 <sup>15</sup> / <sub>16</sub>	4	36355	96355	36455	96455
M12	1.75	D11	1 <sup>21</sup> / <sub>32</sub>	3 <sup>3</sup> / <sub>8</sub>	4	36356	96356	36456	96456
M14	2	D11	1 <sup>21</sup> / <sub>32</sub>	3 <sup>19</sup> / <sub>32</sub>	6	36357	96357	36457	96457
M16	2	D12	1 <sup>13</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	6	36358	96358	36458	96458
M20	2.5	D12	2	4 <sup>15</sup> / <sub>32</sub>	6	36359	96359	36459	96459

# STI (Screw Thread Insert) Straight Flute Hand Taps



STI (Screw Thread Insert) taps are oversize taps that produce a thread that will accept a helical coil wire screw thread insert of the same size and pitch.

**Straight Flute** hand taps are used for hand tapping and machine tapping in through holes and blind holes in a wide variety of materials.

## List No. 2072

**Ground Thread • High Speed Steel • Bright Finish**

Available in Plug (3-5 thread chamfer)  
or Bottoming (1-2 thread chamfer)

## List No. 2072 Machine Screw Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO.	
	UNC	UNF					PLUG	BOTTOM
2	56	—	H1	3	7/16	1-3/4	34149	34049
	56	—	H2	3	7/16	1-3/4	34150	34050
4	40	—	H1	3	9/16	1-7/8	34151	34051
	40	—	H2	3	9/16	1-7/8	34152	34052
5	40	—	H1	3	5/8	1-15/16	34153	34053
	40	—	H2	3	5/8	1-15/16	34154	34054
6	32	—	H2	3	11/16	2	34155	34055
	32	—	H3	3	11/16	2	34156	34056
	—	40	H1	3	11/16	2	34157	34057
	—	40	H2	3	11/16	2	34158	34058
8	32	—	H2	3	3/4	2-1/8	34159	34059
	32	—	H3	3	3/4	2-1/8	34160	34060
10	24	—	H2	3	7/8	2-3/8	34161	34061
	24	—	H3	3	7/8	2-3/8	34162	34062
	—	32	H2	3	7/8	2-3/8	34163	34063
	—	32	H3	3	7/8	2-3/8	34164	34064
12	24	—	H2	3	15/16	2-3/8	34165	34065
	24	—	H3	3	15/16	2-3/8	34166	34066

## List No. 2072 Fractional Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO.	
	UNC	UNF					PLUG	BOTTOM
1/4	20	—	H2	3	1	2-1/2	34167	34067
	20	—	H3	3	1	2-1/2	34168	34068
	—	28	H2	3	1	2-1/2	34169	34069
	—	28	H3	3	1	2-1/2	34170	34070
5/16	18	—	H3	4	1-1/8	2-23/32	34171	34071
	18	—	H4	4	1-1/8	2-23/32	34172	34072
	—	24	H2	4	1-1/8	2-23/32	34173	34073
	—	24	H3	4	1-1/8	2-23/32	34174	34074
3/8	16	—	H3	4	1-1/4	2-15/16	34175	34075
	16	—	H4	4	1-1/4	2-15/16	34176	34076
	—	24	H2	4	1-1/4	2-15/16	34177	34077
	—	24	H3	4	1-1/4	2-15/16	34178	34078
7/16	14	—	H3	4	1-7/16	3-5/32	34179	34079
	14	—	H4	4	1-7/16	3-5/32	34180	34080
	—	20	H3	4	1-7/16	3-5/32	34181	34081
	—	20	H4	4	1-7/16	3-5/32	34182	34082
1/2	13	—	H3	4	1-21/32	3-3/8	34183	34083
	13	—	H4	4	1-21/32	3-3/8	34184	34084
	—	20	H3	4	1-21/32	3-3/8	34185	34085
	—	20	H4	4	1-21/32	3-3/8	34186	34086

# STI (Screw Thread Insert) Spiral Point Plug Taps

STI (Screw Thread Insert) taps are oversize taps that produce a thread that will accept a helical coil wire screw thread insert of the same size and pitch.

Spiral Point taps are designed for machine tapping in through holes in a wide variety of materials. The point ejects the chips ahead of the tap, eliminating chip disposal problems and thread damage. Shallower flutes also result in greater tap core strength allowing for higher cutting speeds.



## List No. 2073

Ground Thread • High Speed Steel • Bright Finish  
Plug (3-5 thread chamfer)

### List No. 2073 Machine Screw Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. PLUG
	UNC	UNF					
2	56	—	H1	2	7/16	1-3/4	33858
	56	—	H2	2	7/16	1-3/4	33859
4	40	—	H1	2	9/16	1-7/8	33860
	40	—	H2	2	9/16	1-7/8	33861
5	40	—	H1	2	5/8	1-15/16	33862
	40	—	H2	2	5/8	1-15/16	33863
6	32	—	H2	2	11/16	2	33864
	32	—	H3	2	11/16	2	33865
	—	40	H1	2	11/16	2	33866
	—	40	H2	2	11/16	2	33867
8	32	—	H2	2	3/4	2-1/8	33868
	32	—	H3	2	3/4	2-1/8	33869
10	24	—	H2	2	7/8	2-3/8	33870
	24	—	H3	2	7/8	2-3/8	33871
	—	32	H2	2	7/8	2-3/8	33872
	—	32	H3	2	7/8	2-3/8	33873
12	24	—	H2	2	15/16	2-3/8	33874
	24	—	H3	2	15/16	2-3/8	33875

### List No. 2073 Fractional Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. PLUG
	UNC	UNF					
1/4	20	—	H2	2	1	2-1/2	33876
	20	—	H3	2	1	2-1/2	33877
	—	28	H2	2	1	2-1/2	33878
	—	28	H3	2	1	2-1/2	33879
5/16	18	—	H3	3	1-1/8	2-23/32	33880
	18	—	H4	3	1-1/8	2-23/32	33881
	—	24	H2	3	1-1/8	2-23/32	33882
	—	24	H3	3	1-1/8	2-23/32	33883
3/8	16	—	H3	3	1-1/4	2-15/16	33884
	16	—	H4	3	1-1/4	2-15/16	33885
	—	24	H2	3	1-1/4	2-15/16	33886
	—	24	H3	3	1-1/4	2-15/16	33887
7/16	14	—	H3	3	1-7/16	3-5/32	33888
	14	—	H4	3	1-7/16	3-5/32	33889
	—	20	H3	3	1-7/16	3-5/32	33890
	—	20	H4	3	1-7/16	3-5/32	33891
1/2	13	—	H3	3	1-21/32	3-3/8	33892
	13	—	H4	3	1-21/32	3-3/8	33893
	—	20	H3	3	1-21/32	3-3/8	33894
	—	20	H4	3	1-21/32	3-3/8	33895

# STI (Screw Thread Insert) Fast Spiral • Spiral Flute Bottoming Taps



STI (Screw Thread Insert) taps are oversize taps that produce a thread that will accept a helical coil wire screw thread insert of the same size and pitch.

**Spiral Flute** taps lift the chips out of the hole in blind hole tapping, eliminating chip disposal problems, damaged threads and broken taps. They will also bridge interruptions in the tapped hole.

**Fast Spiral** taps provide enhanced chip lifting action, will bridge wider interruptions and have a freer-cutting geometry. Recommended for softer materials that produce stringy chips.

List No. 2074

Ground Thread • High Speed Steel • Bright Finish  
Bottoming (1-2 thread chamfer)

## List No. 2074 Machine Screw Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. BOTTOM
	UNC	UNF					
2	56	—	H1	2	7/16	1-3/4	33930
	56	—	H2	2	7/16	1-3/4	33931
4	40	—	H1	2	9/16	1-7/8	33932
	40	—	H2	2	9/16	1-7/8	33933
5	40	—	H1	3	5/8	1-15/16	33934
	40	—	H2	3	5/8	1-15/16	33935
6	32	—	H2	3	11/16	2	33936
	32	—	H3	3	11/16	2	33937
	—	40	H1	3	11/16	2	33938
	—	40	H2	3	11/16	2	33939
8	32	—	H2	3	3/4	2-1/8	33940
	32	—	H3	3	3/4	2-1/8	33941
10	24	—	H2	3	7/8	2-3/8	33942
	24	—	H3	3	7/8	2-3/8	33943
	—	32	H2	3	7/8	2-3/8	33944
	—	32	H3	3	7/8	2-3/8	33945
12	24	—	H2	3	15/16	2-3/8	33946
	24	—	H3	3	15/16	2-3/8	33947

## List No. 2074 Fractional Sizes

SIZE	TPI		PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO. BOTTOM
	UNC	UNF					
1/4	20	—	H2	3	1	2-1/2	33948
	20	—	H3	3	1	2-1/2	33949
	—	28	H2	3	1	2-1/2	33950
	—	28	H3	3	1	2-1/2	33951
5/16	18	—	H3	3	1-1/8	2-23/32	33952
	18	—	H4	3	1-1/8	2-23/32	33953
	—	24	H2	3	1-1/8	2-23/32	33954
	—	24	H3	3	1-1/8	2-23/32	33955
3/8	16	—	H3	3	1-1/4	2-15/16	33956
	16	—	H4	3	1-1/4	2-15/16	33957
	—	24	H2	3	1-1/4	2-15/16	33958
	—	24	H3	3	1-1/4	2-15/16	33959
7/16	14	—	H3	3	1-7/16	3-5/32	33960
	14	—	H4	3	1-7/16	3-5/32	33961
	—	20	H3	3	1-7/16	3-5/32	33962
	—	20	H4	3	1-7/16	3-5/32	33963
1/2	13	—	H3	3	1-21/32	3-3/8	33964
	13	—	H4	3	1-21/32	3-3/8	33965
	—	20	H3	3	1-21/32	3-3/8	33966
	—	20	H4	3	1-21/32	3-3/8	33967

# Taper Pipe Reamers

High Speed Steel - Left Hand Helical Flute  
Right Hand Cut

3/4" Taper per foot. For reaming holes to be tapped with American Standard taper pipe taps.

Fraise à tuyau

Rima de tubería



List No. 2116

STANDARD PACKAGE All sizes — 1 each

FOR THREAD SIZE	DIAMETER LARGE END	DIAMETER SMALL END	FLUTE LENGTH	OAL	EDP NO.
1/8	.362	.316	3/4	2 1/8	36081
1/4	.472	.406	1 1/16	2 7/16	36082
3/8	.606	.540	1 1/16	2 9/16	36083
1/2	.751	.665	1 3/8	3 1/8	36084
3/4	.962	.876	1 3/8	3 1/4	36085
1	1.212	1.103	1 3/4	3 3/4	36086
1 1/4	1.553	1.444	1 3/4	4	36087
1 1/2	1.793	1.684	1 3/4	4 1/4	36088
2	2.268	2.159	1 3/4	4 1/2	36089

Tool Coatings Also Available

# Taper Pipe Taps

Ground Thread — High Speed Steel  
NPT/ANPT—NPTF  
Bright Finish

Chamfer - 2 - 3-1/2 threads

Regular Thread NPT taper pipe taps are commonly used for tapping pipe fittings and couplings in a wide variety of materials. Assembly requires the use of a thread sealant to ensure a tight seal.

NPTF Dryseal taper pipe taps produce threads where a tight seal is achieved during assembly by metal-to-metal contact. Used for applications requiring a tight seal without the use of thread sealants.

Interrupted Thread taper pipe taps reduce friction, increase chip capacity and enhance coolant flow to the cutting teeth for reduced chance of torn threads and improved thread quality. Recommended for a wide variety of materials, especially soft ductile materials and materials producing long continuous chips.

Taraud au pas du gaz

Machuelo de roscar para tuberías



List No. 2113 Interrupted Thread



List No. 2119 Regular Thread

STANDARD PACKAGE 1/16" thru 1/4" — 6 each  
3/8" thru 2" — 1 each

For 1/8" Taps:  
Small Shank = .3125" dia.  
Large Shank = .4375" dia.

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES.		INTERRUPTED THREAD LIST NO. 2113 EDP NO.		REGULAR THREAD LIST NO. 2119 EDP NO.	
			LIST NO. 2113	LIST NO. 2119	NPT/ANPT	NPTF	NPT/ANPT	NPTF
1/16-27	1 1/16	2 1/8	5	4	—	—	36121	36141
1/8-27* (Sm. Sk.)	3/4	2 1/8	5	4	36001	36021	36122	36142
1/8-27* (Lg. Sk.)	3/4	2 1/8	5	4	36002	36022	36123	36143
1/4-18	1 1/16	2 7/16	5	4	36003	36023	36124	36144
3/8-18	1 1/16	2 9/16	5	4	36004	36024	36125	36145
1/2-14	1 3/8	3 1/8	5	4	36005	36025	36126	36146
3/4-14	1 3/8	3 1/4	5	5	36006	36026	36127	36147
1-1 1/2	1 3/4	3 3/4	5	5	36007	36027	36128	36148
1 1/4-1 1/2	1 3/4	4	5	5	36008	—	36129	36149
1 1/2-1 1/2	1 3/4	4 1/4	7	7	36009	—	36130	36150
2-1 1/2	1 3/4	4 1/2	7	7	36010	—	36131	36151

\*Large shank furnished unless otherwise specified.



# Straight Pipe Taps

Taraud au pas du gaz

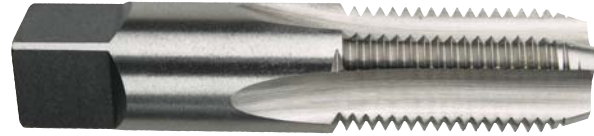
Machuelo de rosca para tuberías

**Ground Thread — High Speed Steel  
NPS/NPSF**

**Bright Finish**

**NPS** straight pipe taps produce straight pipe threads for low pressure applications in a wide variety of materials. Can be assembled with taper pipe threads, straight pipe threads or fittings. Assembly requires the use of a thread sealant to ensure a tight seal.

**NPSF Dryseal** straight pipe taps produce threads where a tight seal is achieved during assembly by metal-to-metal contact when assembled with dryseal taper pipe threads. Used for applications requiring a tight seal without the use of thread sealants.



**List No. 2123**

**STANDARD** 1/8" thru 1/4" — 6 each  
**PACKAGE** 3/8" thru 1" — 1 each

Furnished in Plug style chamfer only. NPS also suitable for NPSC or NPSM work.

SIZE	NUMBER OF FLUTES	THREAD LENGTH	OAL	EDP NO.	
				NPS	NPSF
1/8-27* (Sm. Sk.)	4	3/4	2 1/8	36161	36181
1/8-27* (Lg. Sk.)	4	3/4	2 1/8	36162	36182
1/4-18	4	1 1/16	2 7/16	36163	36183
3/8-18	4	1 1/16	2 9/16	36164	36184
1/2-14	4	1 3/8	3 1/8	36165	36185
3/4-14	5	1 3/8	3 1/4	36166	36186
1-1 1/2	5	1 3/4	3 3/4	36167	—

\*Large shank furnished unless otherwise specified.

For 1/8" Taps:  
Small Shank = .3125" dia.  
Large Shank = .4375" dia.

# Taper Pipe Taps For Cast Iron

Taraud au pas du gaz

Machuelo de rosca para tuberías

**Ground Thread — High Speed Steel**

**NPT**

Taper pipe taps for **Cast Iron** feature specific geometry and a wear resistant surface finish for tapping materials that produce small or powdery chips. Recommended for cast iron, cast brass and other brass materials and non-metals that produce small or powdery chips. Assembly requires the use of a thread sealant to ensure a tight seal.

Furnished with 2-3/4" thread chamfer in NPT thread form  
1°-3° Rake.



**List No. 2133 Steam Oxide Over Nitride Finish**

**STANDARD** 1/8" thru 1/4" — 6 each  
**PACKAGE** 3/8" thru 2" — 1 each

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	NPT EDP NO.
1/8-27 (Lg. Sk.)	3/4	2 1/8	4	36202
1/4-18	1 1/16	2 7/16	4	36203
3/8-18	1 1/16	2 9/16	4	36204
1/2-14	1 3/8	3 1/8	4	36205
3/4-14	1 3/8	3 1/4	5	36206

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	NPT EDP NO.
1-1 1/2	1 3/4	3 3/4	5	36207
1 1/4-1 1/2	1 3/4	4	5	36208
1 1/2-1 1/2	1 3/4	4 1/4	7	36209
2-1 1/2	1 3/4	4 1/2	7	36210

For 1/8" Taps:  
Small Shank = .3125" dia.  
Large Shank = .4375" dia.

# High Hook Taper Pipe Taps

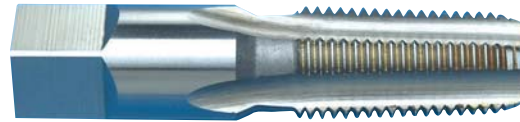
Ground Thread — High Speed Steel  
NPT/NPTF  
Bright Finish

**High Hook** taper pipe taps feature specific geometry for tapping ductile materials and soft gummy materials including aluminum, mild steels, free machining stainless steels, leaded steels and other materials. **NPT** threads require the use of a thread sealant to ensure a tight seal. **NPTF** threads are used for applications requiring a tight seal without the use of thread sealants.

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.	
				NPT	NPTF
1/8-27 (Lg. Sk.)	3/4	2 1/8	4	36188	36194
1/4-18	1 1/16	2 7/16	4	36189	36195
3/8-18	1 1/16	2 9/16	4	36190	36196
1/2-14	1 3/8	3 1/8	4	36191	36197
3/4-14	1 3/8	3 1/4	5	36192	36198
1-1 1/2	1 3/4	3 3/4	5	36193	36199

Taraud au pas du gaz

Machuelo de roscar para tuberías



## List No. 2120

Taper — 3/4" per foot  
Chamfer — 2 - 3-1/2 threads

For 1/8" Taps:  
Small Shank = .3125" dia.  
Large Shank = .4375" dia.

**STANDARD PACKAGE** 1/8" thru 1/4" — 6 each  
3/8" thru 1" — 1 each

# Spiral Flute Taper Pipe Taps

Ground Thread — High Speed Steel  
NPT/NPTF — 30° Spiral Flute  
Bright Finish

**Spiral Flute** taper pipe taps are recommended for tapping stringy and ductile materials that produce long stringy chips. The **spiral flute** lifts the chips out of the hole to eliminate chip packing in the flutes. **NPT** threads require the use of a thread sealant to ensure a tight seal. **NPTF** threads are used for applications requiring a tight seal without the use of thread sealants.

Tool Coatings Also Available

SIZE	THREAD LENGTH	OAL	NO. OF FLUTES	EDP NO.	
				NPT	NPTF
1/8-27 (Lg. Sk.)	3/4	2 1/8	4	36168	36173
1/4-18	1 1/16	2 7/16	4	36169	36174
3/8-18	1 1/16	2 9/16	4	36170	36175
1/2-14	1 3/8	3 1/8	4	36171	36176
3/4-14	1 3/8	3 1/4	5	36172	36177

Taraud au pas du gaz

Machuelo de roscar para tuberías



## List No. 2121

Chamfer — 2 - 3-1/2 threads

**STANDARD PACKAGE** 1/8" thru 1/4" — 6 each  
3/8" thru 3/4" — 1 each

## SPECIAL TAPS FAST QUOTE SERVICE

Call Morse Cutting Tools for all of your special tap needs.  
To expedite your quote please provide the following information:

TAP SIZE \_\_\_\_\_ CLASS of FIT or H LIMIT \_\_\_\_\_ # of FLUTES \_\_\_\_\_  
TYPE of TAP \_\_\_\_\_ SURFACE TREATMENT \_\_\_\_\_  
MATERIAL to be THREADED \_\_\_\_\_ HARDNESS \_\_\_\_\_  
BLIND or THROUGH HOLE \_\_\_\_\_ LENGTH of THREAD \_\_\_\_\_  
# of HOLES to TAP \_\_\_\_\_ TAPPING EQUIPMENT USED \_\_\_\_\_  
CURRENT TAP USED \_\_\_\_\_ TAPPING PROBLEM \_\_\_\_\_

# Combined Tap and Drill

High Speed Steel  
Bright Finish

**Combined Tap and Drills** drill and tap in a single pass for increased productivity. Recommended for through hole applications up to 2X the nominal diameter of the tap. The self-centering point eliminates the need for center drilling or center punching. **NOTE: Drill point must penetrate the workpiece prior to start of tapping.**

## List No. 2080 — Machine Screw & Fractional

TAP SIZE	UNC	TPI	UNF	PITCH DIA. LIMIT	THREAD LENGTH	DRILL SIZE	DRILL LENGTH	OAL	EDP NO.
4	-		48	H2	3/8	.0945	1/4	1 7/8	<b>38601*</b>
5	40		-	H2	13/32	.1040	9/32	1 15/16	<b>38602*</b>
	-		44	H2	13/32	.1060	9/32	1 15/16	<b>38603*</b>
6	32		-	H3	7/16	.1115	5/16	2	<b>38604</b>
	-		40	H2	7/16	.1170	5/16	2	<b>38605*</b>
8	32		-	H3	1/2	.1375	3/8	2 1/8	<b>38606</b>
	-		36	H2	1/2	.1405	3/8	2 1/8	<b>38607*</b>
10	24		-	H3	5/8	.1545	13/32	2 3/8	<b>38608</b>
	-		32	H3	5/8	.1635	13/32	2 3/8	<b>38609</b>
12	24		-	H3	2 1/32	.1805	15/32	2 3/8	<b>38610</b>
	-		28	H3	2 1/32	.1860	15/32	2 3/8	<b>38611*</b>
1/4	20		-	H5	25/32	.2080	17/32	2 1/2	<b>38612</b>
	-		28	H4	25/32	.2220	17/32	2 1/2	<b>38613</b>
5/16	18		-	H5	15/16	.2660	1 1/16	2 27/32	<b>38614</b>
	-		24	H4	15/16	.2770	1 1/16	2 27/32	<b>38615</b>
3/8	16		-	H5	1 1/16	.3225	1 3/16	3 3/8	<b>38616</b>
	-		24	H4	1 1/16	.3395	1 3/16	3 3/8	<b>38617</b>
7/16	14		-	H5	1 1/4	.3770	1	3 3/4	<b>38618</b>
	-		20	H5	1 1/4	.3955	1	3 3/4	<b>38619</b>
1/2	13		-	H5	1 3/8	.4350	1 1/8	4 1/16	<b>38620</b>
	-		20	H5	1 3/8	.4580	1 1/8	4 1/16	<b>38621</b>

## List No. 2080 — Metric

TAP SIZE	PITCH DIA. LIMIT	THREAD LENGTH	DRILL SIZE	DRILL LENGTH	OAL	EDP NO.
M4 x 0.7	D4	1/2	.1340	3/8	2 1/8	<b>38622</b>
M5 x 0.8	D4	5/8	.1700	13/32	2 3/8	<b>38623</b>
M6 x 1	D5	25/32	.2030	17/32	2 1/2	<b>38624</b>
M8 x 1.25	D5	15/16	.2730	1 1/16	2 27/32	<b>38625</b>
M10 x 1.5	D6	1 1/16	.3440	1 3/16	3 3/8	<b>38626</b>
M12 x 1.75	D6	1 3/8	.4140	1 1/8	4 1/16	<b>38627</b>

\* Available While Supplies Last

# Nut Taps

Ground Thread - High Speed Steel  
Long Chamfer - H3 Pitch Dia. Limit  
Bright Finish

**Nut taps** feature a long thread length, a long chamfer and a long reduced shank smaller than the minor diameter of the thread. They were originally designed for threading hex nuts with the finished nuts collecting on the shank until unloaded. The long chamfer spreads the cutting load over a larger area and helps to center the threads. The reduced shank also enhances chip removal and workpiece clearance.

Taraud long à queue moyenne Machuelo de rosca para tuercas



List No. 2052

STANDARD PACKAGE

All sizes — 1 each

SIZE	TPI UNC	NO. OF FLUTES	THREAD LENGTH	OAL	EDP NO.
1/4	20	4	1 5/8	5	<b>33176</b>
5/16	18	4	1 13/16	5 1/2	<b>33177</b>
3/8	16	4	2	6	<b>33178</b>
1/2	13	4	2 1/2	7	<b>33179</b>

# Pulley Taps

Ground Thread — High Speed Steel  
Bright Finish

**Pulley** taps, commonly used wherever extra reach is required, were originally designed for tapping holes in pulleys with hubs. The shank diameter is the same diameter as the major diameter of the thread and the threaded section has the same dimensions as a standard hand tap.

SIZE	TPI UNC	THREAD LENGTH	NO. OF FLUTES	6" LENGTH EDP NO.	8" LENGTH EDP NO.	10" LENGTH EDP NO.	12" LENGTH EDP NO.
1/4	20	1	4	34201	34207	—	—
5/16	18	1 1/8	4	34202	34208	—	—
3/8	16	1 1/4	4	34203	34209	34213	—
7/16	14	1 7/16	4	34204	34210	—	—
1/2	13	1 21/32	4	34205	34211	34214	34217
5/8	11	1 13/16	4	34206	34212	34215	—
3/4	10	2	4	—	—	34216	—

Taraud à poulies

Machuelo de roscar para poleas



List No. 2082

Plug Style - H3 Pitch Dia. Limit

STANDARD PACKAGE All sizes — 1 each

## Solid Round Dies NPT - Taper Pipe Sizes

Carbon Steel

**THICKNESS** 1 Inch O.D., 3/8 Inch Thick  
1 1/2 Inch O.D., 1/2 Inch Thick  
2 Inch O.D., 5/8 Inch Thick

Filière ronde pleine

Tarraja redonda sólida

List No. 1198

STANDARD PACKAGE All sizes — 1 each



NPT SIZE	1" O.D. EDP NO.	1-1/2" O.D. EDP NO.	2" O.D. EDP NO.
1/8-27	31251	31252	—
1/4-18	—	31253	31255
3/8-18	—	31254	31256
1/2-14	—	—	31257

## Adjustable Round Split Dies Machine Screw Sizes

Carbon Steel

**Adjustable Round Split** dies use a set screw for adjustment of the thread size for precision threading applications.

Filière ronde réglable

Tarraja redonda ajustable

List No. 1190

STANDARD PACKAGE All sizes — 1 each

**THICKNESS**  
13/16" O.D., 1/4" Thick  
1" O.D., 3/8" Thick



SIZE	UNC	TPI	UNF	13/16" O.D. EDP NO.
0	—	—	80	31101
1	64	—	—	31102
		—	72	31103
2	56	—	—	31104
		—	64	31105
3	48	—	—	31106
		—	56	31107
4	40	—	36*	31108
		—	—	31109
		—	48	31110
5	40	—	—	31111
		—	44	31112

SIZE	UNC	TPI	UNF	13/16" O.D. EDP NO.	1" O.D. EDP NO.
6	32	—	—	31113	31121
		—	40	31114	—
8	32	—	—	31115	31122
		—	36	31116	—
10	24	—	—	31117	31123
		—	32	31118	31124
12	24	—	—	31119	31125
		—	28	31120	—

\*UNS

# Adjustable Round Split Dies Fractional Sizes

Filière ronde réglable

Tarrajá redonda ajustable

## Carbon Steel

Adjustable Round Split dies use a set screw for adjustment of the thread size for precision threading applications.

### THICKNESS

13/16" O.D., 1/4" Thick

2" O.D., 5/8" Thick

1" O.D., 3/8" Thick

2½" O.D., 3/4" Thick

1½" O.D., 1/2" Thick

3" O.D., 1" Thick



List No. 1195

STANDARD  
PACKAGE

All sizes — 1 each

SIZE	UNC	TPI		13/16" O.D. EDP NO.	1" O.D. EDP NO.	1-1/2" O.D. EDP NO.	2" O.D. EDP NO.
		UNF	UNS				
¼	20	—	—	31158	31164	31177	31191
	—	28	—	31159	31165	31178	31192
⅕	18	—	—	31160	31168	31179	31193
	—	24	—	—	31169	31180	31194
⅜	16	—	—	—	31171	31181	31195
	—	24	—	—	31172	31182	31196
7/16	14	—	—	—	31173	31183	31197
	—	20	—	—	31174	31184	31198
½	13	—	—	—	31175	31185	31199
	—	20	—	—	31176	31186	31200
9/16	12	—	—	—	—	31187	31201
	—	18	—	—	—	31188	31202

SIZE	UNC	TPI		1-1/2" O.D. EDP NO.	2" O.D. EDP NO.	2-1/2" O.D. EDP NO.	3" O.D. EDP NO.
		UNF	UNS				
5/8	11	—	—	31189	31203	31213	—
	—	18	—	31190	31204	—	—
11/16	—	—	11	—	31205	—	—
	—	—	16	—	31206	—	—
¾	10	—	—	—	31207	31214	—
	—	16	—	—	31208	31215	—
7/8	9	—	—	—	31209	31216	—
	—	14	—	—	31210	31217	—
1	8	—	—	—	31211	31218	31221
	—	12	—	—	31212	31219	31222
1 1/8	7	—	—	—	—	—	31224
	—	12	—	—	—	—	31225
1 1/4	7	—	—	—	—	—	31226
	—	12	—	—	—	—	31227
1 3/8	6	—	—	—	—	—	31228
	—	12	—	—	—	—	31229
1 1/2	6	—	—	—	—	—	31230
	—	12	—	—	—	—	31231

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Adjustable Round Split Dies High Speed Steel

Filière ronde réglable

Tarrajá redonda ajustable

Adjustable Round Split dies use a set screw for adjustment of the thread size for precision threading applications.

High Speed Steel dies recommended for longer tool life.

## THICKNESS

- 13/16" O.D., 1/4" Thick
- 1" O.D., 3/8" Thick
- 1 1/2" O.D., 1/2" Thick
- 2" O.D., 5/8" Thick



List No. 2190 Machine Screw

List No. 2195 Fractional

List No. 2195M Metric

STANDARD PACKAGE All sizes — 1 each

## List No. 2190 Machine Screw

SIZE	TPI		13/16" O.D. EDP NO.	1" O.D. EDP NO.	SIZE	TPI		13/16" O.D. EDP NO.	1" O.D. EDP NO.
	UNC	UNF				UNC	UNF		
5	40	—	31501	—	8	—	36	31506	—
	—	44	31502	—		10	24	—	31507
6	32	—	31503	31511	12		—	32	31508
	—	40	31504	—		28	24	—	31509
8	32	—	31505	31512	—		—	28	31510

## List No. 2195 Fractional

SIZE	TPI		13/16" O.D. EDP NO.	1" O.D. EDP NO.	1-1/2" O.D. EDP NO.	2" O.D. EDP NO.
	UNC	UNF				
1/4	20	—	31526	31530	31538	—
	—	28	31527	31531	31539	—
5/16	18	—	31528	31532	31540	—
	—	24	31529	31533	31541	—
3/8	16	—	—	31534	31542	—
	—	24	—	31535	31543	—
7/16	14	—	—	31536	31544	—
	—	20	—	31537	31545	—
1/2	13	—	—	—	31546	—
	—	20	—	—	31547	—
9/16	12	—	—	—	31548	—
	—	18	—	—	31549	—
5/8	11	—	—	—	31550	31552
	—	18	—	—	31551	31553
3/4	10	—	—	—	—	31554
	—	16	—	—	—	31555
7/8	9	—	—	—	—	31556
	—	14	—	—	—	31557

## List No. 2195M Metric

SIZE	13/16" O.D. EDP NO.	1" O.D. EDP NO.	SIZE	1" O.D. EDP NO.	1-1/2" O.D. EDP NO.
M3 x 0.5	31561	—	M10 x 1.5	31570	—
M3.5 x 0.6	31562	—	M12 x 1.75	31571	—
M4 x 0.7	31563	—	M14 x 2	—	31572
M4.5 x 0.75	31564	—	M16 x 2	—	31573
M5 x 0.8	31565	—	M18 x 2.5	—	31574
M6 x 1	31566	31567	M20 x 2.5	—	31575
M7 x 1	—	31568			

# Hexagon Rethreading Dies

## Carbon Steel

Hexagon Rethreading dies are used in repair and maintenance applications to repair existing bruised or rusty threads. They are not recommended for cutting new threads.

**STANDARD PACKAGE** All sizes — 1 each

### List No. 1266 Fractional

SIZE	UNC	DIMENSIONS				EDP NO.
		TPI UNF	UNS	ACROSS FLATS	THICKNESS	
1/4	20	—	—	19/32	1/4	31301
	—	28	—	19/32	1/4	31302
5/16	18	—	—	11/16	5/16	31303
	—	24	—	11/16	5/16	31304
3/8	16	—	—	25/32	3/8	31305
	—	24	—	25/32	3/8	31306
7/16	14	—	—	7/8	7/16	31307
	—	20	—	7/8	7/16	31308
1/2	13	—	—	1 1/16	1/2	31309
	—	20	—	1 1/16	1/2	31310
9/16	12	—	—	1 1/16	1/2	31311
	—	18	—	1 1/16	1/2	31312
5/8	11	—	—	1 1/4	5/8	31313
	—	18	—	1 1/4	5/8	31314
1 1/16	—	—	11	1 7/16	3/4	31315
	—	—	16	1 7/16	3/4	31316

### List No. 1266M Metric

SIZE	DIMENSIONS		EDP NO.
	ACROSS FLATS	THICKNESS	
M5 x 0.8	19/32	1/4	31340
M6 x 1	19/32	1/4	31341
M8 x 1.25	1 1/16	5/16	31342
M10 x 1.5	7/8	7/16	31343
M12 x 1.75	1 1/16	1/2	31344
M14 x 2	1 1/16	1/2	31345
M16 x 2	1 1/4	5/8	31346
M20 x 2.5	1 5/8	7/8	31347

# Hexagon Rethreading Die Sets

## Carbon Steel



List No. 7200

## Écrou-filière hexagonal

### Tarrajá hexagonal refileteadora



### List No. 1266 Fractional

### List No. 1266M Metric

### List No. 1267 Taper Pipe — NPT

SIZE	UNC	DIMENSIONS				EDP NO.
		TPI UNF	UNS	ACROSS FLATS	THICKNESS	
3/4	10	—	—	1 7/16	3/4	31317
	—	16	—	1 7/16	3/4	31318
7/8	9	—	—	1 5/8	7/8	31319
	—	14	—	1 5/8	7/8	31320
1	8	—	—	1 13/16	1	31321
	—	12	—	1 13/16	1	31322
	—	—	14	1 13/16	1	31323
1 1/8	7	—	—	2	1	31324
	—	12	—	2	1	31325
1 1/4	7	—	—	2 3/16	1	31326
	—	12	—	2 3/16	1	31327
1 3/8	6	—	—	2 3/8	1	31328
	—	12	—	2 3/8	1	31329
1 1/2	6	—	—	2 9/16	1	31330
	—	12	—	2 9/16	1	31331

### List No. 1267 Taper Pipe — NPT

SIZE	TPI	DIMENSIONS		EDP NO.
		ACROSS FLATS	THICKNESS	
1/8	27	1 1/16	3/8	31332
1/4	18	1 1/4	5/8	31333
3/8	18	1 7/16	5/8	31334
1/2	14	1 5/8	3/4	31335
3/4	14	2	13/16	31336
1	11 1/2	2 3/8	1	31337

### Jeu de filières

### Juego de terrajas

EDP NO. 37021	EDP NO. 37022	EDP NO. 37023	
SET NO. 194	SET NO. 195	SET NO. 200	
UNC	UNF	UNC	UNF
1/4 - 20	1/4 - 28	1/4 - 20	1/4 - 28
5/16 - 18	5/16 - 24	5/16 - 18	5/16 - 24
3/8 - 16	3/8 - 24	3/8 - 16	3/8 - 24
7/16 - 14	7/16 - 20	7/16 - 14	7/16 - 20
1/2 - 13	1/2 - 20	1/2 - 13	1/2 - 20
9/16 - 12	9/16 - 18	9/16 - 12	9/16 - 18
5/8 - 11	5/8 - 18	5/8 - 11	5/8 - 18
3/4 - 10	3/4 - 16	3/4 - 10	3/4 - 16
7/8 - 9	7/8 - 14	7/8 - 9	7/8 - 14
1 - 8	1 - 12	1 - 8	1 - 12

# Tap and Drill Kits

Ensemble de tarauds et de forets

Juegos de machuelos y brocas

## 3 Series Available • NC, NF, Metric

### ALL KITS INCLUDE

- 10 popular sized high speed steel hand taps.
- 10 popular sized high speed steel screw machine length drills.
- 128 Page Machinist's Guide for Taps.
- Packaged in a durable plastic pouch.



List No. 8001

EDP NO. 37103		EDP NO. 37104		EDP NO. 37105	
SET NO. 103 NC TAPS		SET NO. 104 NF TAPS		SET NO. 105 METRIC TAPS	
UNC TAPS	DRILLS	UNF TAPS	DRILLS	METRIC TAPS	DRILLS
#4-40	#44	#4-48	#43	M3 x 0.5	#40
#5-40	#39	#5-44	#38	M3.5 x 0.6	#33
#6-32	#36	#6-40	#34	M4 x 0.7	#30
#8-32	#30	#8-36	#29	M4.5 x 0.75	#26
#10-24	#25	#10-32	#21	M5 x 0.8	#19
1/4-20	#7	1/4-28	#3	M6 x 1	#9
5/16-18	F	5/16-24	I	M7 x 1	15/64
3/8-16	5/16	3/8-24	Q	M8 x 1.25	17/64
7/16-14	U	7/16-20	W	M10 x 1.5	Q
1/2-13	27/64	1/2-20	29/64	M12 x 1.75	Y

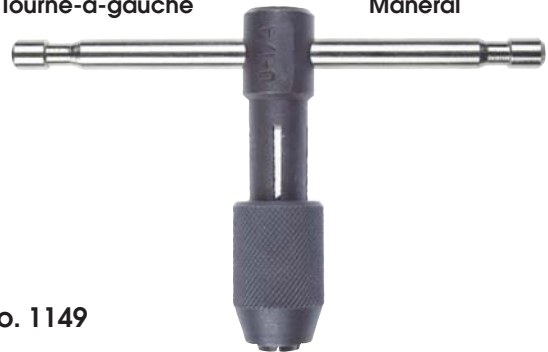
## "T" Handle Tap Wrenches

Holds tap sizes indicated and also can be used for driving screw extractors. Split jaw construction gives a positive holding grip enhancing its use for hand operations encompassing light drilling and reaming as well.

Sliding handle with spring tension stop. May be extended for more leverage. Has positive grip knurled nut.

**STANDARD PACKAGE** All sizes — 1 each

Tourne-à-gauche Maneral



List No. 1149

WRENCH NO.	INCH	TAPS CAPACITY		EDP NO.
		METRIC		
2	0-1/4	M1.5-M6.3		30522
4	1/4 - 1/2	M6.3-M12.5		30524

## Tap Wrenches

Tourne-à-gauche Maneral



List No. 1148

**STANDARD PACKAGE** All sizes — 1 each

WRENCH NO.	CAPACITY CUTTING SIZE			EDP NO.
	FRACTIONAL TAPS	PIPE TAPS	REAMERS	
11	1/16 - 1/4		1/8 - 17/64	30501
12	1/16 - 3/8		1/8 - 25/64	30502
13	5/32 - 1/2	1/8	11/64 - 7/16	30503
14	5/32 - 3/4	1/8 - 1/4	11/64 - 41/64	30504
15	1/4 - 11/8	1/8 - 3/4	9/32 - 29/32	30505
16	3/4 - 15/8	3/8 - 1 1/4	37/64 - 1 11/32	30506
17	1 - 2 1/2	3/4 - 2	7/8 - 2 1/2	30507

## Die Stocks

Porte-filière Terraaja de cojinetes



List No. 1179

**STANDARD PACKAGE** All sizes — 1 each

DIE STOCK NO.	CAPACITY		EDP NO.
	DIE O.D.	DIE THICKNESS	
2	13/16	1/4	30512
3	1	3/8	30513
5	1 1/2	1/2	30514
6	2	5/8	30515
7	2 1/2	3/4	30516
8	3	1	30517



## Tap and Die Sets



### 23-Pc. #4 thru #12 NC & NF Tap & Die Set

Set No. 31

#4 to #12 NC & NF HSS Plug Taps  
#4 to #12 NC & NF Carbon Steel  $1\frac{3}{16}$ " OD Adjustable Dies  
#2 Die Stock  
#2 "T" Handle Tap Wrench  
Screw Driver  
Plastic Case

List No. 7130 EDP No. 37011



### 23-Pc. 1/4" thru 1/2" NC & NF Tap & Die Set

Set No. 100

$\frac{1}{4}$  to  $\frac{1}{2}$  NC & NF HSS Plug Taps  
 $\frac{1}{4}$  to  $\frac{1}{2}$  NC & NF Carbon Steel 1" OD Adjustable Dies  
#3 Die Stock  
#4 "T" Handle Tap Wrench  
Screw Driver  
Plastic Case

List No. 7120 EDP No. 37001



### 49-Pc. 1/4" thru 1" NC & NF Tap & Die Set

Set No. 101

$\frac{1}{4}$  to 1 NC & NF HSS Plug Taps  
 $\frac{1}{8}$  NPT HSS Plug Tap  
 $\frac{1}{4}$  to  $\frac{3}{8}$  NC & NF &  $\frac{1}{8}$  NPT Carbon Steel 1" OD Adjustable Dies  
 $\frac{7}{16}$  to  $\frac{5}{8}$  NC & NF Carbon Steel  $1\frac{1}{2}$ " OD Adjustable Dies  
 $\frac{3}{4}$  to 1 NC & NF Carbon Steel 2" OD Adjustable Dies  
#3, #5 & #6 Die Stocks  
#13 & #15 Straight Tap Wrenches  
2 Screw Driver  
Plastic Case

List No. 7120 EDP No. 37002

# SHEARTAP™ Cutting Speeds

WORKPIECE MATERIAL	BRINELL HARDNESS (BHN)	SURFACE SPEED (SFM)
Low Carbon Steel - 1118, 12L12, 1108, 1213	≤120	65
Low & Medium Carbon Steel - 1018, 1551, 11L44	120 - 250	40
Medium Carbon and Alloyed Steel - 1040, 1140, 4340, 8640	≤250	40
Free Machining Stainless Steels - 303, 410, 416, 440F	≤260	35
Moderate Machining Stainless Steels - 304, 316	≤300	20

## Standard Taps Cutting Speeds

Workpiece Material	Brinell Hardness (BHN)	Surface Speed (SFM)
Low Carbon Steel - 1018, 12L12, 1108, 1213	≤ 120	65
Low & Medium Carbon Steel - 1018, 1551, 11L44	120 - 250	40
Medium Carbon and Alloyed Steel - 1040, 1140, 4340, 8640	≤ 250	40
Tool and Die Steels - P20, A2, D2, H12	≤ 250	20
Tool and Die Steels - P20, A2, D2, H12	250 - 350	15
Free Machining Stainless Steels - 303, 410, 416, 440F	≤ 260	35
Moderate Machining Stainless Steels - 304, 316	≤ 300	25
Difficult Machining Stainless Steels - 17-4PH, 316L, AM350	≤ 300	10
Cast Iron - Soft Gray	≤ 160	70
Cast Iron - Gray	160 - 260	60
Cast Iron - Ductile	250	50
Cast Iron - Malleable	250 - 330	35
Titanium Alloys - Commercially Pure 99.0	110 - 170	20
Titanium Alloys - Ti-6Al-4V, ASTM B367 Grades C-3, C-4	≤ 250	15
High Temperature Alloys - Inconel, Hastelloy, Waspaloy	≤ 150	25
High Temperature Alloys - Inconel, Hastelloy, Waspaloy	150 - 250	10
Aluminum Alloys - 2025, 6061, A140, 514.0	≤ 150	100
Copper Alloys - Brass and Bronze	≤ 200	50
Magnesium Alloys - AZ80A, HM12A, AM60A, ZE41A	50 - 90	70

**SPEEDS** shown are suggested starting points only and may be increased or decreased depending on actual material and machining conditions. Start conservatively and increase until the machining cycle is optimized.

**TAP SPEEDS** may be **increased** for coated taps, spiral point taps, fine pitch taps and when the percentage of thread is decreased.

**TAP SPEEDS** may need to be **decreased** for uncoated taps, spiral flute taps, coarse pitch taps, bottoming taps, difficult materials, longer thread lengths, and when the percentage of thread is increased.

**THREAD FORMING TAPS** generally form threads more efficiently at higher speeds. Suggested speeds are 50% to 100% higher than the suggested speeds for cutting taps in similar applications.

**PIPE TAP SPEEDS** should be between one-half and three-quarters of the speeds of taps of comparable diameter and pitch.

# Hole Diameters for Tapping

UNIFIED THREADS			METRIC THREADS		
TAP SIZE	CUTTING TAPS Based on 75% Thread (in.)	FORMING TAPS Based on 65% Thread (in.)	TAP SIZE	CUTTING TAPS Based on 75% Thread (in.)	FORMING TAPS Based on 65% Thread (in.)
0-80	0.0478"	0.0545"	M1.6 X 0.35	0.0496"	0.0569"
1-64	0.0578"	0.0661"	M1.8 X 0.35	0.0574"	0.0648"
1-72	0.0595"	0.0669"	M2 X 0.4	0.0634"	0.0718"
2-56	0.0686"	0.0781"	M2.2 X 0.45	0.0694"	0.0788"
2-64	0.0708"	0.0791"	M2.5 X 0.45	0.0812"	0.0906"
3-48	0.0787"	0.0898"	M3 X 0.5	0.0989"	0.1094"
3-56	0.0816"	0.0911"	M3.5 X 0.6	0.1148"	0.1274"
4-40	0.0876"	0.1010"	M4 X 0.7	0.1306"	0.1453"
4-48	0.0917"	0.1028"	M4.5 X 0.75	0.1484"	0.1641"
5-40	0.1006"	0.1140"	M5 X 0.8	0.1662"	0.1829"
5-44	0.1029"	0.1150"	M6 X 1.0	0.1979"	0.2188"
6-32	0.1076"	0.1242"	M7 X 1.0	0.2372"	0.2582"
6-40	0.1136"	0.1270"	M8 X 1.25	0.2670"	0.2932"
8-32	0.1336"	0.1502"	M8 X 1.0	0.2766"	0.2976"
8-36	0.1369"	0.1517"	M10 X 1.5	0.3362"	0.3676"
10-24	0.1494"	0.1716"	M10 X 1.25	0.3458"	0.3719"
10-32	0.1596"	0.1762"	M12 X 1.75	0.4053"	0.4420"
12-24	0.1754"	0.1976"	M12 X 1.25	0.4245"	0.4507"
12-28	0.1812"	0.2002"	M14 X 2.0	0.4745"	0.5164"
1/4-20	0.2013"	0.2279"	M14 X 1.5	0.4936"	0.5251"
1/4-28	0.2152"	0.2342"	M16 X 2.0	0.5532"	0.5951"
5/16-18	0.2584"	0.2879"	M16 X 1.5	0.5724"	0.6038"
5/16-24	0.2719"	0.2941"	M18 X 2.5	0.6128"	0.6652"
3/8-16	0.3141"	0.3474"	M18 X 1.5	0.6511"	0.6826"
3/8-24	0.3344"	0.3566"	M20 X 2.5	0.6915"	0.7439"
7/16-14	0.3679"	0.4059"	M20 X 1.5	0.7299"	0.7613"
7/16-20	0.3888"	0.4154"	M22 X 2.5	0.7702"	0.8226"
1/2-13	0.4251"	0.4660"	M22 X 1.5	0.8086"	0.8400"
1/2-20	0.4513"	0.4779"	M24 X 3.0	0.8298"	0.8927"
9/16-12	0.4813"	0.5257"	M24 X 2.0	0.8682"	
9/16-18	0.5084"	0.5379"	M27 X 3.0	0.9479"	
5/8-11	0.5364"	0.5848"	M27 X 2.0	0.9863"	
5/8-18	0.5709"	0.6004"	M30 X 3.5	1.0469"	
3/4-10	0.6526"	0.7058"	M30 X 2.0	1.1044"	
3/4-16	0.6891"	0.7224"	M33 X 3.5	1.1650"	
7/8-9	0.7668"		M33 X 2.0	1.2225"	
7/8-14	0.8054"		M36 X 4.0	1.2639"	
1-8	0.8782"		M36 X 3.0	1.3023"	
1-12	0.9188"		M39 X 4.0	1.3820"	
1-14	0.9304"		M39 X 3.0	1.4204"	

## Pipe Taps

TAP SIZE	NPT** HOLE SIZE	NPTF** HOLE SIZE	NPS HOLE SIZE	NPSF HOLE SIZE
1/16	0.2460"	0.2420"	0.2500"	0.2460"
1/8	0.3390"	0.3320"	0.3438"	0.3390"
1/4	0.4375"	0.4375"	0.4375"	0.4375"
3/8	0.5781"	0.5625"	0.5781"	0.5781"
1/2	0.7031"	0.7031"	0.7188"	0.7188"
3/4	0.9063"	0.9063"	0.9375"	0.9219"
1	1.1406"	1.1406"	1.1719"	1.1563"
1-1/4	1.4844"	1.4844"	1.5156"	
1-1/2	1.7344"	1.7344"	1.7500"	
2	2.2031"	2.1875"	2.2187"	
2-1/2	2.6250"	2.6250"	2.6563"	
3	3.2500"	3.2500"		

\*\*For tapping without reaming

**NOTE:** Information in this chart is for reference only. We will not be held liable for any consequential damages or economic loss due to the use of information contained within this chart.

# Tap Drill Sizes – STI (Screw Thread Insert) Taps

STI TAP SIZE	ALUMINUM		STEEL, PLASTIC, MAGNESIUM		MINOR DIA. LIMITS (AFTER TAPPING)	
	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	TAP DRILL SIZE	DECIMAL EQUIV. OF TAP DRILL (INCHES)	MIN.	MAX.
2 - 56	3/32	.0938	#41	.0960	.0899	.0961
4 - 40	#31	.1200	#31	.1200	.1175	.1252
5 - 40	3.4mm	.1339	#29	.1360	.1305	.1373
6 - 32	#26	.1470	#25	.1495	.1448	.1527
6 - 40	#26	.1470	#25	.1495	.1435	.1503
8 - 32	#17	.1730	#16	.1770	.1708	.1781
10 - 24	13/64	.2031	#5	.2055	.1990	.2080
10 - 32	#7	.2010	13/64	.2031	.1968	.2041
12 - 24	#1	.2280	#1	.2280	.2250	.2340
1/4 - 20	H	.2660	H	.2660	.2608	.2704
1/4 - 28	G	.2610	6.7mm	.2638	.2577	.2646
5/16 - 18	Q	.3320	Q	.3320	.3245	.3342
5/16 - 24	21/64	.3281	21/64	.3281	.3215	.3288
3/8 - 16	X	.3970	X	.3970	.3885	.3987
3/8 - 24	25/64	.3906	25/64	.3906	.3840	.3910
7/16 - 14	29/64	.4531	29/64	.4531	.4530	.4639
7/16 - 20	29/64	.4531	29/64	.4531	.4483	.4561
1/2 - 13	33/64	.5156	17/32	.5312	.5166	.5273
1/2 - 20	33/64	.5156	33/64	.5156	.5108	.5186

Recommended tap drill sizes may vary slightly from recommended minor diameter limits to enable use of standard stock drill sizes. This variance does not cause any issues in most applications.

Drill sizes shown for steel, plastic and magnesium are such as to allow for material contraction in softer materials and to provide increased tap life. Variations in material and equipment may require the use of drills which are larger or smaller than those recommended.

Threads produced should be checked with thread plug gages to ensure that the threads meet required specifications.

**NOTE:** Information in this chart is for reference only. We will not be held liable for any consequential damages or economic loss due to the use of information contained within this chart.

## Tapping Formulas

### Formula for Obtaining Tap Drill Sizes for Cutting Taps:

$$\text{Major Dia. of Thread} - \frac{.01299 \times \text{Amt. of percentage of full thread}}{\text{No. of threads per inch}} = \text{Drilled Hole* Size}$$

Note: Select nearest commercial stock drill.

### Percentage of Full Thread for Other Drill Sizes

$$\text{No. of Threads per Inch} \times \frac{\text{Major Dia. Selected of Thread} - \text{Drill Dia.}}{.01299} = \text{Percentage of Full Thread}$$

### Formula For Obtaining Tap Drill Sizes For Thread Forming Taps:

$$\begin{aligned} \text{*Drill Hole Size (inches)} &= \text{Basic Major Dia. of thread (inches)} - .0068 \times \frac{\text{Percentage of Full Thread}}{\text{No. of Threads per Inch}} \\ \text{*Drilled Hole Size (mm)} &= \text{Basic Major Dia. of thread (mm)} - \frac{\text{Percentage of Full Thread} \times \text{mm Pitch}}{147.06} \end{aligned}$$

\*Note: Drill size should be smaller than hole size by the probable amount the drill will cut oversize.

# Standard Taps

## Class of Fit Recommendations

These tap recommendations will produce the specified class of fit in most applications. Threads produced should be checked with thread plug gages to ensure that the threads meet required specifications. Threads that gage loose or tight may require experimentation with taps of lower or higher pitch diameter limit ("H" or "D" number).

Unified and American National Screw Threads							
Nominal Size	Threads Per Inch		Recommended Tap for Class of Thread		Pitch Diameter Limits for Class of Thread		
	UNC	UNF	Class 2B	Class 3B	Minimum (Basic)	Maximum Class 2B	Maximum Class 3B
0	—	80	H2	H1	.0519	.0542	.0536
1	64	—	H2	H1	.0629	.0655	.0648
1	—	72	H2	H1	.0640	.0665	.0659
2	56	—	H2	H1	.0744	.0772	.0765
2	—	64	H2	H1	.0759	.0786	.0779
3	48	—	H2	H1	.0855	.0885	.0877
3	—	56	H2	H1	.0874	.0902	.0895
4	40	—	H2	H2	.0958	.0991	.0982
4	—	48	H2	H1	.0985	.1016	.1008
5	40	—	H2	H2	.1088	.1121	.1113
5	—	44	H2	H1	.1102	.1134	.1126
6	32	—	H3	H2	.1177	.1214	.1204
6	—	40	H2	H2	.1218	.1252	.1243
8	32	—	H3	H2	.1437	.1475	.1465
8	—	36	H2	H2	.1460	.1496	.1487
10	24	—	H3	H3	.1629	.1672	.1661
10	—	32	H3	H2	.1697	.1736	.1726
12	24	—	H3	H3	.1889	.1933	.1922
12	—	28	H3	H3	.1928	.1970	.1959
1/4	20	—	H5	H3	.2175	.2224	.2211
1/4	—	28	H4	H3	.2268	.2311	.2300
5/16	18	—	H5	H3	.2764	.2817	.2803
5/16	—	24	H4	H3	.2854	.2902	.2890
3/8	16	—	H5	H3	.3344	.3401	.3387
3/8	—	24	H4	H3	.3479	.3528	.3516
7/16	14	—	H5	H3	.3911	.3972	.3957
7/16	—	20	H5	H3	.4050	.4104	.4091
1/2	13	—	H5	H3	.4500	.4565	.4548
1/2	—	20	H5	H3	.4675	.4731	.4717
9/16	12	—	H5	H3	.5084	.5152	.5135
9/16	—	18	H5	H3	.5264	.5323	.5308
5/8	11	—	H5	H3	.5660	.5732	.5714
5/8	—	18	H5	H3	.5889	.5949	.5934
3/4	10	—	H5	H3	.6850	.6927	.6907
3/4	—	16	H5	H3	.7094	.7159	.7143
7/8	9	—	H6	H4	.8028	.8110	.8089
7/8	—	14	H6	H4	.8286	.8356	.8339
1	8	—	H6	H4	.9188	.9276	.9254
1	—	12	H6	H4	.9459	.9535	.9516
1	—	14*	H6	H4	.9536	.9609	.9590
1 1/8	7	—	H8	H4	1.0322	1.0416	1.0393
1 1/8	—	12	H6	H4	1.0709	1.0787	1.0768
1 1/4	7	—	H8	H4	1.1572	1.1668	1.1644
1 1/4	—	12	H6	H4	1.1959	1.2039	1.2019
1 3/8	6	—	H8	H4	1.2667	1.2771	1.2745
1 3/8	—	12	H6	H4	1.3209	1.3291	1.3270
1 1/2	6	—	H8	H4	1.3917	1.4022	1.3996
1 1/2	—	12	H6	H4	1.4459	1.4542	1.4522

\*UNS

# Standard Metric Taps

## Class of Fit Recommendations

These tap recommendations will produce the specified class of fit in most applications. Threads produced should be checked with thread plug gages to ensure that the threads meet required specifications. Threads that gage loose or tight may require experimentation with taps of lower or higher pitch diameter limit ("H" or "D" number).

Metric Threads						
Size mm	Pitch mm	Recommended Tap for Class of Thread		Pitch Diameter Limits for Class of Thread		
		Class 4H	Class 6H	Minimum (Basic)	Maximum Class 4H	Maximum Class 6H
M1.6	0.35	D1	D3	1.373	1.426	1.458
M1.8	0.35	D1	D3	1.573	1.626	1.658
M2	0.4	D1	D3	1.740	1.796	1.830
M2.2	0.45	D1	D3	1.908	1.968	2.003
M2.5	0.45	D1	D3	2.208	2.268	2.303
M2.6	0.45	D1	D2	2.308	2.368	2.403
M3	0.5	D1	D3	2.675	2.738	2.775
M3.5	0.6	D1	D4	3.110	3.181	3.222
M4	0.75	D2	D3	3.513	3.588	3.631
M4	0.7	D2	D4	3.545	3.620	3.663
M4.5	0.75	D2	D4	4.013	4.088	4.131
M5	0.9	D2	D3	4.415	4.501	4.549
M5	0.8	D2	D4	4.480	4.560	4.605
M5.5	0.9	D2	D3	4.915	5.002	5.050
M6	1	D3	D5	5.350	5.445	5.500
M6	0.75	D3	D4	5.513	5.598	5.645
M7	1	D3	D5	6.350	6.445	6.500
M8	1.25	D3	D5	7.188	7.288	7.348
M8	1	D3	D5	7.350	7.445	7.500
M9	1.25	D3	D5	8.188	8.288	8.348
M9	1	D3	D5	8.350	8.445	8.500
M10	1.5	D3	D6	9.026	9.138	9.206
M10	1.25	D3	D5	9.188	9.288	9.348
M10	1	D3	D5	9.350	9.445	9.500
M11	1.5	D3	D5	10.026	10.138	10.206
M12	1.75	D3	D6	10.863	10.988	11.063
M12	1.5	D3	D6	11.026	11.144	11.216
M12	1.25	D3	D5	11.188	11.300	11.368
M14	2	D3	D7	12.701	12.833	12.913
M14	1.5	D3	D6	13.026	13.144	13.216
M14	1.25	D3	D5	13.188	13.300	13.368
M16	2	D4	D7	14.701	14.833	14.913
M16	1.5	D3	D6	15.026	15.144	15.216
M18	2.5	D4	D7	16.376	16.516	16.600
M18	1.5	D3	D6	17.026	17.144	17.216
M20	2.5	D4	D7	18.376	18.516	18.600
M20	1.5	D3	D6	19.026	19.144	19.216
M22	2.5	D4	D7	20.376	20.516	20.600
M22	1.5	D3	D6	21.026	21.144	21.216
M24	3	D4	D8	22.051	22.221	22.316
M24	2	D4	D7	22.701	22.841	22.925
M24	1.5	D3	D5	23.026	23.151	23.226
M25	1.5	D3	D5	24.026	24.151	24.226
M27	3	D5	D8	25.051	25.221	25.316
M27	2	D5	D7	25.701	25.841	25.925
M30	3.5	D5	D9	27.727	27.907	28.007
M30	2	D5	D7	28.701	28.841	28.925
M32	2	D5	D7	30.701	30.841	30.925
M33	3.5	D5	D9	30.727	30.907	31.007
M33	2	D5	D7	31.701	31.841	31.925
M36	4	D5	D9	33.402	33.592	33.702
M36	3	D5	D8	34.051	34.221	34.316
M36	2	D5	D7	34.701	34.841	34.925
M39	4	D6	D9	36.402	36.592	36.702
M39	3	D6	D8	37.051	37.221	37.316

# Fluteless Thread Forming Taps

## Class of Fit Recommendations

These tap recommendations will produce the specified class of fit in most applications. Threads produced should be checked with thread plug gages to ensure that the threads meet required specifications. Threads that gage loose or tight may require experimentation with taps of lower or higher pitch diameter limit ("H" or "D" number).

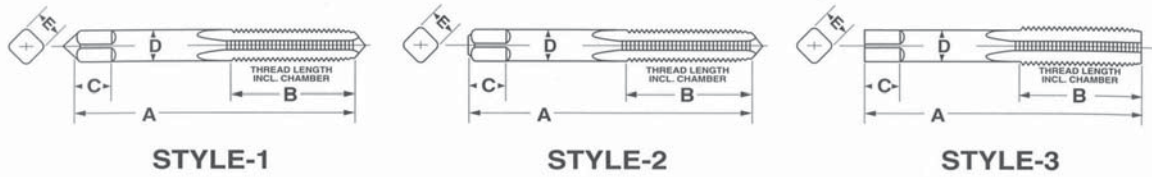
### Machine Screw & Fractional

SIZE	THREADS PER INCH		"H" LIMIT for CLASS of FIT		
	UNC	UNF	2	2B	3B
0	80	—	H2	H3	H2
1	64	—	H2	H3	H2
	—	72	H2	H3	H2
2	56	—	H2	H3	H2
	—	64	H2	H3	H2
3	48	—	H2	H3	H2
	—	56	H2	H3	H2
4	40	—	H3	H5	H3
	—	48	H3	H5	H3
5	40	—	H3	H5	H3
	—	44	H3	H5	H3
6	32	—	H3	H5	H3
	—	40	H3	H5	H3
8	32	—	H3	H5	H3
	—	36	H3	H5	H3
10	24	—	H4	H6	H4
	—	32	H4	H6	H4
12	24	—	H4	H6	H4
	—	28	H4	H6	H4
1/4	20	—	H4	H6	H4
	—	28	H4	H6	H4
5/16	18	—	H5	H7	H5
	—	24	H5	H7	H5
3/8	16	—	H5	H7	H5
	—	24	H5	H7	H5
7/16	14	—	H5	H8	H5
	—	20	H5	H8	H5
1/2	13	—	H5	H8	H5
	—	20	H5	H8	H5
9/16	12	—	H7	H10	H7
	—	18	H7	H10	H7
5/8	11	—	H7	H10	H7
	—	18	H7	H10	H7
3/4	10	—	H7	H10	H7
	—	16	H7	H10	H7

### Metric

SIZE	PITCH	"D" LIMIT for CLASS of FIT	
		4H	6H
M3	0.5	D3	D5
M4	0.7	D4	D6
M5	0.8	D4	D7
M6	1	D5	D8
M8	1.25	D5	D9
M10	1.5	D6	D10
M12	1.75	D6	D11
M14	2	D7	D11
M16	2	D7	D12
M20	2.5	D7	D12

# Table 302 — Hand Taps



## General Dimensions

NOMINAL DIA. RANGE-INCHES		MACHINE SCREW SIZE NO.	NOMINAL FRACTIONAL DIAMETER (INCHES)	NOMINAL METRIC DIAMETER (MM)	STYLE	TAP DIMENSIONS — INCHES				
						LENGTH OVERALL A	THREAD LENGTH B	SQUARE LENGTH C	SHANK DIAMETER D	SIZE OF SQUARE E
.052	.065	0	1/16	M1.6	1	1 5/8	5/16	3/16	.141	.110
.065	.078	1	—	M1.8	1	1 11/16	3/8	3/16	.141	.110
.078	.091	2	—	M2, M2.2	1	1 3/4	7/16	3/16	.141	.110
.091	.104	3	3/32	M2.5	1	1 13/16	1/2	3/16	.141	.110
.104	.117	4	—	—	1	1 7/8	9/16	3/16	.141	.110
.117	.130	5	1/8	M3, M3.15	1	1 15/16	5/8	3/16	.141	.110
.130	.145	6	—	M3.5	1	2	1 1/16	3/16	.141	.110
.145	.171	8	5/32	M4	1	2 1/8	3/4	1/4	.168	.131
.171	.197	10	3/16	M4.5, M5	1	2 3/8	7/8	1/4	.194	.152
.197	.223	12	7/32	—	1	2 3/8	1 5/16	9/32	.220	.165
.223	.260	14	1/4	M6, M6.3	2	2 1/2	1	5/16	.255	.191
.260	.323		5/16	M7, M8	2	2 23/32	1 1/8	3/8	.318	.238
.323	.395		3/8	M10	2	2 15/16	1 1/4	7/16	.381	.286
.395	.448		7/16	—	3	3 5/32	1 7/16	13/32	.323	.242
.448	.510		1/2	M12, M12.5	3	3 3/8	1 21/32	7/16	.367	.275
.510	.573		9/16	M14	3	3 19/32	1 21/32	1/2	.429	.322
.573	.635		5/8	M16	3	3 13/16	1 13/16	9/16	.480	.360
.635	.709		1 1/16	M18	3	4 1/32	1 13/16	5/8	.542	.406
.709	.760		3/4	—	3	4 1/4	2	1 1/16	.590	.442
.760	.823		13/16	M20	3	4 15/32	2	1 1/16	.652	.489
.823	.885		7/8	M22	3	4 11/16	2 7/32	3/4	.697	.523
.885	.948		15/16	M24	3	4 29/32	2 7/32	3/4	.760	.570
.948	1.010		1	M25	3	5 1/8	2 1/2	13/16	.800	.600
1.010	1.073		1 1/16	M27	3	5 1/8	2 1/2	7/8	.896	.672
1.073	1.135		1 1/8	—	3	5 7/16	2 9/16	7/8	.896	.672
1.135	1.198		1 3/16	M30	3	5 7/16	2 9/16	1	1.021	.766
1.198	1.260		1 1/4	—	3	5 3/4	2 9/16	1	1.021	.766
1.260	1.323		1 5/16	M33	3	5 3/4	2 9/16	1 1/16	1.108	.831
1.323	1.385		1 3/8	—	3	6 1/16	3	1 1/16	1.108	.831
1.385	1.448		1 7/16	M36	3	6 1/16	3	1 1/8	1.233	.925
1.448	1.510		1 1/2	—	3	6 3/8	3	1 1/8	1.233	.925
1.510	1.635		1 5/8	M39	3	6 11/16	3 3/16	1 1/8	1.305	.979
1.635	1.760		1 3/4	M42	3	7	3 3/16	1 1/4	1.430	1.072
1.760	1.885		1 7/8	—	3	7 5/16	3 3/16	1 1/4	1.519	1.139
1.885	2.010		2	M48	3	7 5/8	3 3/16	1 3/8	1.644	1.233
2.010	2.135		2 1/8	—	3	8	3 3/16	1 3/8	1.769	1.327
2.135	2.260		2 1/4	M56	3	8 1/4	3 3/16	1 7/16	1.894	1.420
2.260	2.385		2 3/8	—	3	8 1/2	4	1 7/16	2.019	1.514
2.385	2.510		2 1/2	—	3	8 3/4	4	1 1/2	2.100	1.575
2.510	2.635		2 5/8	M64	3	8 3/4	4	1 1/2	2.225	1.669
2.635	2.760		2 3/4	—	3	9 1/4	4	1 9/16	2.350	1.762
2.760	2.885		2 7/8	M72	3	9 1/4	4	1 9/16	2.475	1.856

(continued)



# Table 302 — Hand Taps (continued)

## General Dimensions

NOMINAL DIA. RANGE-INCHES		MACHINE SCREW SIZE NO.	NOMINAL FRACTIONAL DIAMETER (INCHES)	NOMINAL METRIC DIAMETER (MM)	STYLE	TAP DIMENSIONS —INCHES				
						LENGTH OVERALL A	THREAD LENGTH B	SQUARE LENGTH C	SHANK DIAMETER D	SIZE OF SQUARE E
2.885	3.010		3	—	3	9 <sup>3</sup> / <sub>4</sub>	4 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>8</sub>	2.543	1.907
3.010	3.135		3 <sup>1</sup> / <sub>8</sub>	—	3	9 <sup>3</sup> / <sub>4</sub>	4 <sup>9</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>8</sub>	2.668	2.001
3.135	3.260		3 <sup>1</sup> / <sub>4</sub>	M80	3	10	4 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	2.793	2.095
3.260	3.385		3 <sup>3</sup> / <sub>8</sub>	—	3	10	4 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	2.883	2.162
3.385	3.510		3 <sup>1</sup> / <sub>2</sub>	—	3	10 <sup>1</sup> / <sub>4</sub>	4 <sup>15</sup> / <sub>16</sub>	2	3.008	2.256
3.510	3.635		3 <sup>5</sup> / <sub>8</sub>	M90	3	10 <sup>1</sup> / <sub>4</sub>	4 <sup>15</sup> / <sub>16</sub>	2	3.133	2.350
3.635	3.760		3 <sup>3</sup> / <sub>4</sub>	—	3	10 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>	3.217	2.413
3.760	3.885		3 <sup>7</sup> / <sub>8</sub>	—	3	10 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>	3.342	2.506
3.885	4.010		4	M100	3	10 <sup>3</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	3.467	2.600

## Tolerances

ELEMENT	NOMINAL DIAMETER RANGE —INCHES		DIRECTION	TOLERANCE — INCHES
	OVER	TO (Incl.)		
Length Overall — A	.052	1.010	Plus or Minus	1/32
	1.010	4.010	Plus or Minus	1/16
Length of Thread — B	.052	.223	Plus or Minus	3/64
	.223	.510	Plus or Minus	1/16
	.510	1.510	Plus or Minus	3/32
	1.510	4.010	Plus or Minus	1/8
Length of Square — C	.052	1.010	Plus or Minus	1/32
	1.010	4.010	Plus or Minus	1/16
Diameter of Shank — D	.052	.223	Minus	.0015
	.223	.635	Minus	.0015
	.635	1.010	Minus	.002
	1.010	1.510	Minus	.002
	1.510	2.010	Minus	.003
	2.010	4.010	Minus	.003
Size of Square — E	.052	.510	Minus	.004
	.510	1.010	Minus	.006
	1.010	2.010	Minus	.008
	2.010	4.010	Minus	.010

### Special Taps

Unless otherwise specified:

Special taps over 1.010" to 1.510" diameter inclusive, having 14 or more threads per inch or 1.75 millimeter pitch and finer, and sizes over 1.510" diameter with 10 or more threads per inch or 2.5 millimeter pitch and finer, are made to general dimensions shown in Table 303.

Special ground thread taps are made to limits shown in Table 331 for Unified Inch Screw Threads and Table 341 for Metric M-Profile Screw Threads.

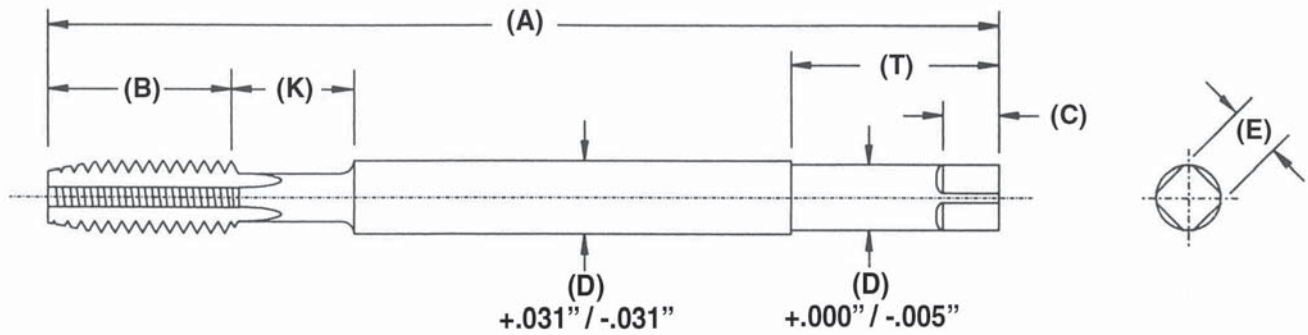
### Notes

Ground thread taps, sizes .395" and smaller, have external center on thread end (may be removed on bottoming taps). Sizes .223" and smaller have external center on shank end; sizes .224" thru .395" have truncated partial cone centers on shank end (length of cone approximately 1/4 of diameter shank). Sizes over .395" have internal center in thread and shank ends.

For standard thread limits and tolerances for Unified Inch Screw Threads see Table 327 and for Metric Threads see Table 337.

For eccentricity tolerances of tap elements see Table 317.

# Table 310 — Pulley Taps



## General Dimensions

DIAMETER OF TAP INCHES	DIMENSIONS - INCHES						
	LENGTH OVERALL A	LENGTH OF THREAD B	LENGTH OF SQUARE C	DIA. OF SHANK D	LENGTH OF CLOSE TOLERANCE T*	SIZE OF SQUARE E	LENGTH OF NECK K**
1/4	6, 8	1	5/16	.255	1 1/2	.191	3/8
5/16	6, 8	1 1/8	3/8	.318	1 9/16	.238	3/8
3/8	6, 8, 10	1 1/4	7/16	.381	1 5/8	.286	3/8
7/16	6, 8	1 7/16	1/2	.444	1 11/16	.333	7/16
1/2	6, 8, 10, 12	1 21/32	9/16	.507	1 11/16	.380	1/2
5/8	6, 8, 10, 12	1 13/16	1 1/16	.633	2	.475	5/8
3/4	10, 12	2	3/4	.759	2 1/4	.569	3/4

## Tolerances

ELEMENT	RANGE	DIRECTION	TOLERANCE
Length Overall — A	1/4" to 3/4" incl.	Plus or Minus	1/16"
Length of Thread — B	1/4" to 3/4" incl.	Plus or Minus	1/16"
Length of Square — C	1/4" to 3/4" incl.	Plus or Minus	1/32"
Diameter of Shank — D	1/4" to 3/4" incl.	Minus	.005"
Size of Square — E	1/4" to 1/2" incl. 5/8" to 3/4" incl.	Minus Minus	.004" .006"

### Formulae (Approximate)

Diameter of Shank "D" = Maximum Major Diameter.

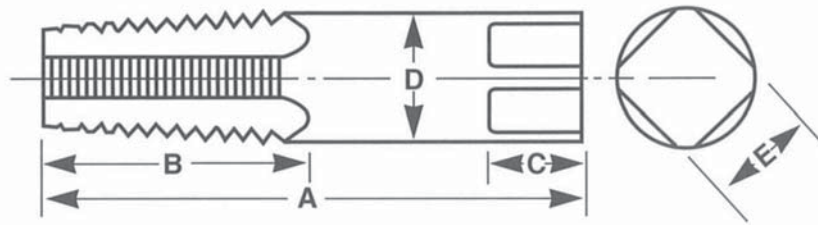
Size of Square = Diameter of Shank "D" x .75 to nearest .001"

### Notes

\*T is minimum length of shank which is held to eccentricity tolerances.

\*\*K (neck and its length) is optional with manufacturer.

# Table 311 — Pipe Taps



## General Dimensions

NOMINAL SIZE INCHES	DIMENSIONS - INCHES				
	LENGTH OVERALL A	LENGTH OF THREAD B	LENGTH OF SQUARE C	DIA. OF SHANK D	SIZE OF SQUARE E
1/16	2 1/8	1 1/16	3/8	.3125	.234
1/8	2 1/8	3/4	3/8	.3125	.234
1/8	2 1/8	3/4	3/8	.4375	.328
1/4	2 7/16	1 1/16	7/16	.5625	.421
3/8	2 9/16	1 1/16	1/2	.7000	.531
1/2	3 1/8	1 3/8	5/8	.6875	.515
3/4	3 1/4	1 3/8	1 1/16	.9063	.679
1	3 3/4	1 3/4	1 3/16	1.1250	.843
1 1/4	4	1 3/4	1 5/16	1.3125	.984
1 1/2	4 1/4	1 3/4	1	1.5000	1.125
2	4 1/2	1 3/4	1 1/8	1.8750	1.406
2 1/2	5 1/2	2 9/16	1 1/4	2.2500	1.687
3	6	2 5/8	1 3/8	2.6250	1.968
3 1/2	6 1/2	2 11/16	1 1/2	2.8125	2.108
4	6 3/4	2 3/4	1 5/8	3.0000	2.250

## Tolerances

ELEMENT	RANGE	DIRECTION	TOLERANCE
Length Overall — A	1/16" to 3/4" incl.	Plus or Minus	1/32"
	1" to 4" incl.	Plus or Minus	1/16"
Length of Thread — B	1/16" to 3/4" incl.	Plus or Minus	1/16"
	1" to 1 1/4" incl.	Plus or Minus	3/32"
	1 1/2" to 4" incl.	Plus or Minus	1/8"
Length of Square — C	1/16" to 3/4" incl.	Plus or Minus	1/32"
	1" to 4" incl.	Plus or Minus	1/16"
Diameter of Shank — D	1/16" to 1/8" incl.	Minus	.0015"
	1/4" to 1/2" incl.	Minus	.0020"
	3/4" to 1" incl.	Minus	.0020"
	1 1/4" to 4" incl.	Minus	.0030"
Size of Square — E	1/16" to 1/8" incl.	Minus	.0040"
	1/4" to 3/4" incl.	Minus	.0060"
	1" to 4" incl.	Minus	.0080"

### USEFUL FORMULAS

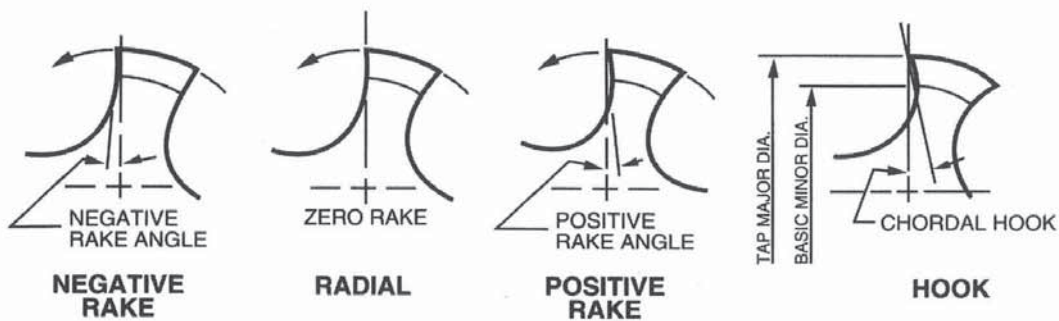
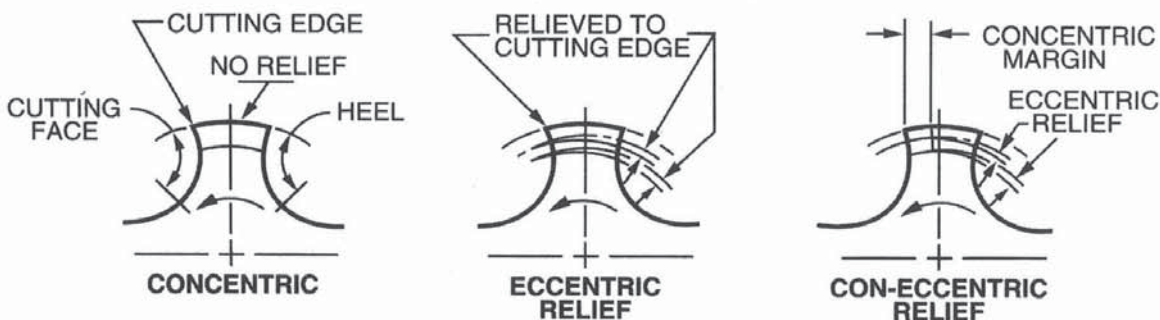
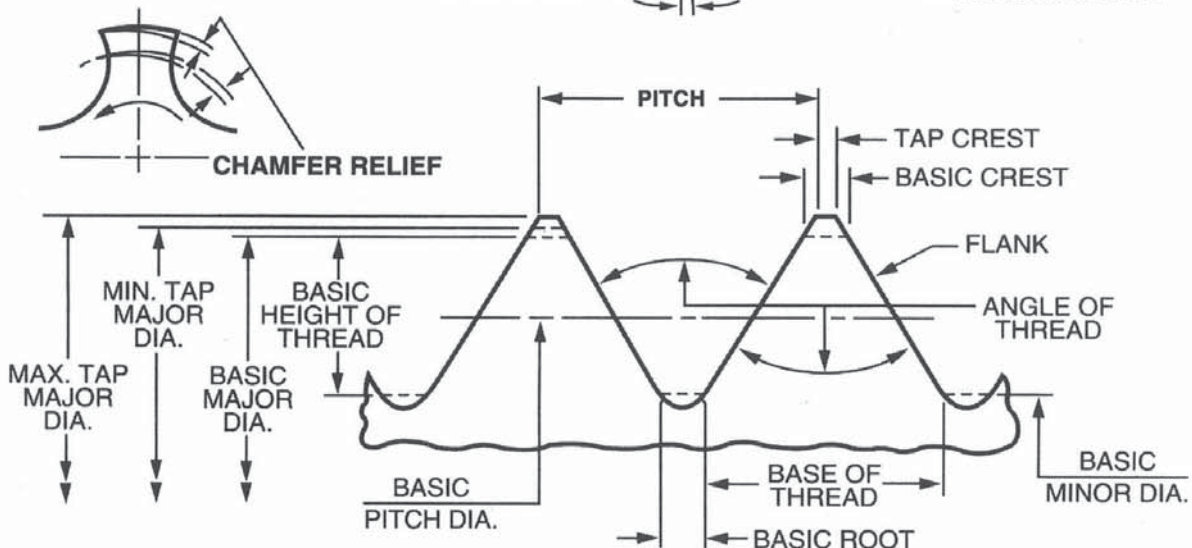
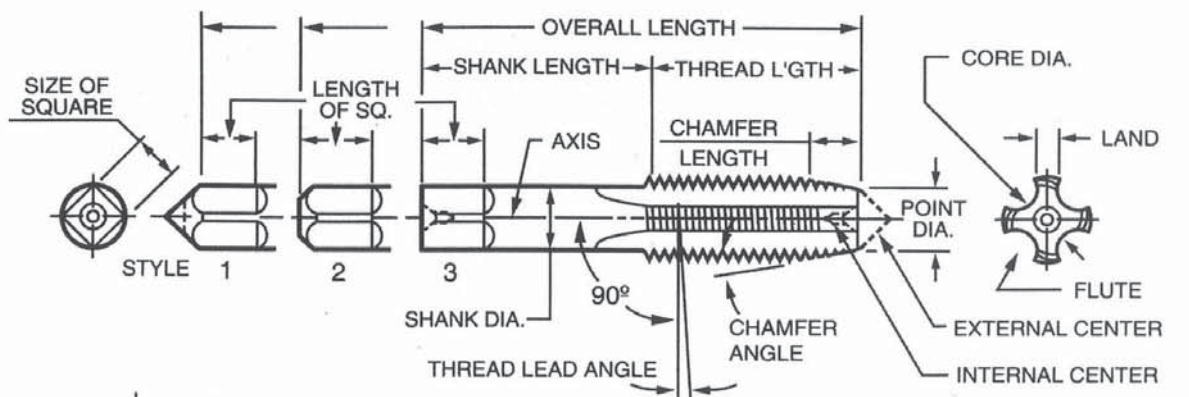
Surface Feet Per Minute = SFM  
 Revolutions Per Minute = RPM  
 Threads Per Inch = TPI  
 Pitch = P  
 Inches Per Minute = IPM

When TPI is known  
 $P = 1 \div TPI$

When SFM and DIA are known:  
 $RPM = 3.82 \times SFM \div DIA$

When RPM and P are known:  
 $IPM = RPM \times P$

# Tap Terminology



# END MILLS

	PAGE NO.		PAGE NO.
<b>SOLID CARBIDE - SINGLE END</b>		90° Point	
2-Flute		<b>Drill-Mill</b> . . . . .	247
Ball Nose		5-Flute	
Regular, Long & Extra Long . . . . .	234	Corner Radius	
Metric . . . . .	235	<b>variFLUTE High Performance</b> . . . . .	200
Miniature Decimal -		Square End	
Regular Length . . . . .	245-246	<b>variFLUTE High Performance</b> . . . . .	201
Miniature Decimal -		<b>SOLID CARBIDE - DOUBLE END</b>	
Stub Length . . . . .	244	2-Flute	
Stub Length . . . . .	236	Ball Nose	
<b>variFLUTE NF High Performance</b> . . . . .	204	Stub Length . . . . .	235
Corner Radius		Square End	
Regular Length . . . . .	242	Stub Length . . . . .	233
<b>variFLUTE NF High Performance</b> . . . . .	202	Regular Length . . . . .	233
Square End		4-Flute	
Regular, Long & Extra Long . . . . .	232	Ball Nose	
Metric . . . . .	233	Stub Length . . . . .	241
Miniature Decimal -		Square End	
Regular Length . . . . .	245-246	Stub Length . . . . .	239
Miniature Decimal -		Regular Length . . . . .	239
Stub Length . . . . .	244	<b>SOLID CARBIDE - ROUGHING</b>	
Stub Length . . . . .	236	Regular Length . . . . .	249
<b>variFLUTE NF High Performance</b> . . . . .	203	<b>SOLID CARBIDE - ROUGHING / FINISHING</b>	
60° & 90° Point		3-Flute	
<b>Drill-Mill</b> . . . . .	247	Corner Radius . . . . .	248
3-Flute		4-Flute	
Ball Nose		Corner Radius . . . . .	248
Regular Length . . . . .	237	<b>COBALT - SINGLE END</b>	
<b>variFLUTE High Performance</b> . . . . .	198	2-Flute	
Corner Radius		Ball Nose	
<b>variFLUTE High Performance</b> . . . . .	197	Regular & Extended Length . . . . .	223
<b>variFLUTE NF High Performance</b> . . . . .	203	Square End	
Square End		Regular Length . . . . .	206-207
Regular Length . . . . .	237	Long Length . . . . .	208
4-Flute		Extended Length . . . . .	209
Ball Nose		90° Point	
Regular, Long & Extra Long . . . . .	240	<b>Drill-Mill</b> . . . . .	210
Metric . . . . .	241	3-Flute	
Miniature Decimal -		Square End	
Regular Length . . . . .	245-246	<b>ShearMill - 60° High Helix</b> . . . . .	214
Miniature Decimal -		Multi-Flute	
Stub Length . . . . .	244	Ball Nose	
Stub Length . . . . .	236	Regular Length . . . . .	226
<b>variFLUTE High Performance</b> . . . . .	198	Square End	
Corner Radius		Regular Length . . . . .	216-217
Regular Length . . . . .	243	Long Length . . . . .	218
<b>variFLUTE High Performance</b> . . . . .	199	Extra Long Length . . . . .	219
Square End		<b>COBALT - DOUBLE END</b>	
Regular, Long & Extra Long . . . . .	238	2-Flute	
<b>variFLUTE High Performance</b> . . . . .	200	Ball Nose	
Metric . . . . .	239	Miniature - 3/16" Shank . . . . .	225
Miniature Decimal -		Square End	
Regular Length . . . . .	245-246	Miniature - 3/16" Shank . . . . .	212-213
Miniature Decimal -		Standard Shank . . . . .	211
Stub Length . . . . .	244		
Stub Length . . . . .	236		

(continued)

**END MILLS** (continued)**COBALT - DOUBLE END** (continued)

## 4-Flute

## Square End

Miniature - 3/16" Shank . . . . .	221-222
Standard Shank . . . . .	220

**COBALT - ROUGHING**

## Multi-Flute

## Square End

Coarse Pitch . . . . .	229
Coarse Pitch - Center Cutting . . . . .	230
Fine Pitch . . . . .	229
Fine Pitch - Center Cutting . . . . .	231

**COBALT - ROUGHING / FINISHING**

Square End . . . . .	228
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**HIGH SPEED STEEL - SINGLE END**

## 2-Flute

## Ball Nose

Regular & Extended Length . . . . .	223
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## Square End

Regular Length . . . . .	206-207
Long Length . . . . .	208
Extended Length . . . . .	209
High Helix . . . . .	210
Metric . . . . .	209

## 3-Flute

## Square End

Regular & Long Length . . . . .	215
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## Multi-Flute

## Ball Nose

Regular & Long Length . . . . .	226
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## Square End

Regular Length . . . . .	216-217
Long Length . . . . .	218
Extra Long Length . . . . .	219
Metric . . . . .	219

**HIGH SPEED STEEL - DOUBLE END**

## 2-Flute

## Ball Nose

Miniature - 3/16" Shank . . . . .	225
Standard Shank . . . . .	224

## Square End

Miniature - 3/16" Shank . . . . .	212-213
Standard Shank . . . . .	211
Stub Length - 3/8" Shank . . . . .	213

## 3-Flute

## Square End

Standard Shank . . . . .	215
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## Multi-Flute

## Square End

Miniature - 3/16" Shank . . . . .	221-222
Standard Shank . . . . .	220
Stub Length - 3/8" Shank . . . . .	222

**HIGH SPEED STEEL - ROUGHING**

## Multi-Flute

## Square End

Coarse Pitch . . . . .	227
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**CUTTING FLUIDS**

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# variFLUTE®

## Variable Flute ALTiN Coated

### HPE High Performance

### Solid Carbide

### Single End Mills

Center Cutting - 38° Helix Angle  
10% Cobalt Micrograin Carbide

HIGH PERFORMANCE MILLING: Carbon Steels, Alloy Steels, Stainless Steels, Mold & Die Steels, High Temperature Alloys, Titanium Alloys, Cast Iron and many other materials.

Variable Flute design reduces chatter, harmonics and cutting forces for increased feed rates, greater depths of cut, improved surface finish and accuracy, minimal tool deflection, reduced machine vibration and increased tool life.

#### TOLERANCES

Diameter +.000/ - .002  
Shank Dia. -.0001/ - .0004

**ALTiN - Aluminum Titanium Nitride** Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento



List No. 5985 3-Flute - Corner Radius



List No. 5988 3-Flute - Ball Nose



List No. 5994 4-Flute - Corner Radius

List No. 5995 4-Flute - Square End



List No. 5996 4-Flute - Ball Nose



List No. 5986 5-Flute - Corner Radius

List No. 5987 5-Flute - Square End



List No. 5985 - 3-Flute - Corner Radius

ALTiN  
COATED

**3-Flute** variFLUTE end mills feature tool geometry for high chip evacuation in slotting and roughing applications.

**Corner Radius** strengthens the end mill to minimize chipping and reduce corner wear. Also used when the finished part requires a radius.

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	CORNER RADIUS	EDP NO.
<b>STUB LENGTH</b>					
1/4	1/4	3/8	2	.015-.020	<a href="#">56270</a>
3/8	3/8	1/2	2	.015-.020	<a href="#">56271</a>
1/2	1/2	5/8	2 1/2	.025-.030	<a href="#">56272</a>
5/8	5/8	3/4	3	.030-.035	<a href="#">56273</a>
3/4	3/4	7/8	3	.030-.035	<a href="#">56274</a>
<b>REGULAR LENGTH</b>					
1/8	1/8	3/8	1 1/2	.010-.015	<a href="#">56275</a>
5/32	3/16	7/16	2	.010-.015	<a href="#">56276</a>
3/16	3/16	7/16	2	.010-.015	<a href="#">56277</a>
7/32	1/4	7/16	2 1/2	.015-.020	<a href="#">56278</a>
1/4	1/4	5/8	2 1/2	.015-.020	<a href="#">56279</a>
9/32	5/16	5/8	2 1/2	.015-.020	<a href="#">56280</a>
5/16	5/16	3/4	2 1/2	.015-.020	<a href="#">56281</a>
3/8	3/8	7/8	2 1/2	.015-.020	<a href="#">56282</a>
7/16	7/16	1	2 3/4	.015-.020	<a href="#">56283</a>
1/2	1/2	1	3	.025-.030	<a href="#">56284</a>
5/8	5/8	1 1/4	3 1/2	.030-.035	<a href="#">56285</a>
3/4	3/4	1 1/2	4	.030-.035	<a href="#">56286</a>
1	1	1 1/2	4	.030-.035	<a href="#">56287</a>

Speeds & Feeds: Page 201

HPE High Performance End Mills

# variFLUTE® Solid Carbide Single End Mills



List No. 5988 – 3-Flute – Ball Nose

ALTiN  
COATED

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**3-Flute** variFLUTE end mills feature tool geometry for high chip evacuation in slotting and roughing applications.

**Ball Nose** for surfacing applications, fillets, radius bottom slots and die cavities.

Speeds & Feeds: Page 201

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
<b>REGULAR LENGTH</b>				
1/8	1/8	3/8	1 1/2	<a href="#">56320</a>
5/32	3/16	7/16	2	<a href="#">56321</a>
3/16	3/16	7/16	2	<a href="#">56322</a>
7/32	1/4	7/16	2 1/2	<a href="#">56323</a>
1/4	1/4	5/8	2 1/2	<a href="#">56324</a>
9/32	5/16	5/8	2 1/2	<a href="#">56325</a>
5/16	5/16	3/4	2 1/2	<a href="#">56326</a>
3/8	3/8	7/8	2 1/2	<a href="#">56327</a>
7/16	7/16	1	2 3/4	<a href="#">56328</a>
1/2	1/2	1	3	<a href="#">56329</a>



List No. 5996 – 4-Flute – Ball Nose

ALTiN  
COATED

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**4-Flute** variFLUTE end mills feature versatile tool geometry for high chip evacuation in slotting applications while providing high surface finish and rapid feed rates in profiling applications.

**Ball Nose** for surfacing applications, fillets, radius bottom slots and die cavities.

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
<b>REGULAR LENGTH</b>				
1/8	1/8	3/8	1 1/2	<a href="#">56373</a>
5/32	3/16	7/16	2	<a href="#">56374</a>
3/16	3/16	7/16	2	<a href="#">56375</a>
7/32	1/4	7/16	2 1/2	<a href="#">56376</a>
1/4	1/4	5/8	2 1/2	<a href="#">56377</a>
9/32	5/16	5/8	2 1/2	<a href="#">56378</a>
5/16	5/16	3/4	2 1/2	<a href="#">56379</a>
3/8	3/8	7/8	2 1/2	<a href="#">56380</a>
7/16	7/16	1	2 3/4	<a href="#">56381</a>
1/2	1/2	1	3	<a href="#">56382</a>
5/8	5/8	1 1/4	3 1/2	<a href="#">56383</a>
3/4	3/4	1 1/2	4	<a href="#">56384</a>
1	1	1 1/2	4	<a href="#">56385</a>

**ALTiN – Aluminum Titanium Nitride** Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.



# variFLUTE® Solid Carbide Single End Mills

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento



List No. 5994 – 4-Flute – Corner Radius

ALTiN  
COATED

4-Flute variFLUTE end mills feature versatile tool geometry for high chip evacuation in slotting applications while providing high surface finish and rapid feed rates in profiling applications.

Corner Radius strengthens the end mill to minimize chipping and reduce corner wear. Also used when the finished part requires a radius.

Speeds & Feeds: Page 201

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	CORNER RADIUS	EDP NO.
<b>STUB LENGTH</b>					
1/4	1/4	3/8	2	.015 - .020	56335
5/16	5/16	3/8	2	.015 - .020	56336
3/8	3/8	1/2	2	.015 - .020	56337
1/2	1/2	5/8	2 1/2	.025 - .030	56338
5/8	5/8	3/4	3	.030 - .035	56339
3/4	3/4	7/8	3	.030 - .035	56340
1	1	1	4	.030 - .035	56341
<b>REGULAR LENGTH</b>					
1/8	1/8	3/8	1 1/2	.010 - .015	56342
5/32	3/16	7/16	2	.010 - .015	56343
3/16	3/16	7/16	2	.010 - .015	56344
7/32	1/4	7/16	2 1/2	.015 - .020	56345
1/4	1/4	5/8	2 1/2	.015 - .020	56346
9/32	5/16	5/8	2 1/2	.015 - .020	56347
5/16	5/16	3/4	2 1/2	.015 - .020	56348
3/8	3/8	7/8	2 1/2	.015 - .020	56349
7/16	7/16	1	2 3/4	.015 - .020	56350
1/2	1/2	1	3	.025 - .030	56351
5/8	5/8	1 1/4	3 1/2	.030 - .035	56352
3/4	3/4	1 1/2	4	.030 - .035	56353
1	1	1 1/2	4	.030 - .035	56354
<b>LONG LENGTH</b>					
1/4	1/4	1 1/4	3	.015 - .020	56355
3/8	3/8	1 1/4	3	.015 - .020	56356
1/2	1/2	2	4	.025 - .030	56357
5/8	5/8	2 1/4	5	.030 - .035	56358
3/4	3/4	2 1/4	5	.030 - .035	56359
<b>EXTENDED LENGTH</b>					
1/4	1/4	5/8	4	.015 - .020	56360
3/8	3/8	7/8	4	.015 - .020	56361
1/2	1/2	1	6	.025 - .030	56362
5/8	5/8	1 1/4	6	.030 - .035	56363
3/4	3/4	1 1/2	6	.030 - .035	56364

**ALTiN – Aluminum Titanium Nitride** Coating is an excellent all-around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

HPE High Performance End Mills

# variFLUTE® Solid Carbide Single End Mills



List No. 5995 – 4-Flute – Square End

ALTiN  
COATED

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**4-Flute** variFLUTE end mills feature versatile tool geometry for high chip evacuation in slotting applications while providing high surface finish and rapid feed rates in profiling applications.

**Square End** for peripheral milling and finishing applications requiring machining to a sharp corner.

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
<b>REGULAR LENGTH</b>				
1/4	1/4	5/8	2 1/2	<a href="#">56365</a>
5/16	5/16	3/4	2 1/2	<a href="#">56366</a>
3/8	3/8	7/8	2 1/2	<a href="#">56367</a>
7/16	7/16	1	2 3/4	<a href="#">56368</a>
1/2	1/2	1	3	<a href="#">56369</a>
5/8	5/8	1 1/4	3 1/2	<a href="#">56370</a>
3/4	3/4	1 1/2	4	<a href="#">56371</a>
1	1	1 1/2	4	<a href="#">56372</a>



List No. 5986 – 5-Flute – Corner Radius

ALTiN  
COATED

Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**5-Flute** variFLUTE end mills with increased core thickness and five flutes provide higher feed rates in profiling and finishing applications and enhanced surface finish.

**Corner Radius** strengthens the end mill to minimize chipping and reduce corner wear. Also used when the finished part requires a radius.

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	CORNER RADIUS	EDP NO.
<b>STUB LENGTH</b>					
1/4	1/4	3/8	2	.015-.020	<a href="#">56290</a>
3/8	3/8	1/2	2	.015-.020	<a href="#">56291</a>
1/2	1/2	5/8	2 1/2	.025-.030	<a href="#">56292</a>
5/8	5/8	3/4	3	.030-.035	<a href="#">56293</a>
3/4	3/4	7/8	3	.030-.035	<a href="#">56294</a>
<b>REGULAR LENGTH</b>					
1/4	1/4	5/8	2 1/2	.015-.020	<a href="#">56295</a>
5/16	5/16	3/4	2 1/2	.015-.020	<a href="#">56296</a>
3/8	3/8	7/8	2 1/2	.015-.020	<a href="#">56297</a>
7/16	7/16	1	2 3/4	.015-.020	<a href="#">56298</a>
1/2	1/2	1	3	.025-.030	<a href="#">56299</a>
5/8	5/8	1 1/4	3 1/2	.030-.035	<a href="#">56300</a>
3/4	3/4	1 1/2	4	.030-.035	<a href="#">56301</a>
1	1	1 1/2	4	.030-.035	<a href="#">56302</a>
<b>LONG LENGTH</b>					
1/4	1/4	1 1/4	3	.015-.020	<a href="#">56330</a>
3/8	3/8	1 1/4	3	.015-.020	<a href="#">56331</a>
1/2	1/2	2	4	.025-.030	<a href="#">56332</a>
5/8	5/8	2 1/4	5	.030-.035	<a href="#">56333</a>
3/4	3/4	2 1/4	5	.030-.035	<a href="#">56334</a>
<b>EXTENDED LENGTH</b>					
1/4	1/4	5/8	4	.015-.020	<a href="#">56303</a>
3/8	3/8	7/8	4	.015-.020	<a href="#">56304</a>
1/2	1/2	1	6	.025-.030	<a href="#">56305</a>
5/8	5/8	1 1/4	6	.030-.035	<a href="#">56306</a>
3/4	3/4	1 1/2	6	.030-.035	<a href="#">56307</a>

Speeds & Feeds: Page 201

# variFLUTE® Solid Carbide Single End Mills



Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**5-Flute** variFLUTE end mills with increased core thickness and five flutes provide higher feed rates in profiling and finishing applications and enhanced surface finish.

**Square End** for peripheral milling and finishing applications requiring machining to a sharp corner.

List No. 5987 – 5-Flute – Square End

ALTiN  
COATED

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
<b>REGULAR LENGTH</b>				
1/4	1/4	5/8	2 1/2	<b>56310</b>
5/16	5/16	3/4	2 1/2	<b>56311</b>
3/8	3/8	7/8	2 1/2	<b>56312</b>
7/16	7/16	1	2 3/4	<b>56313</b>
1/2	1/2	1	3	<b>56314</b>
5/8	5/8	1 1/4	3 1/2	<b>56315</b>
3/4	3/4	1 1/2	4	<b>56316</b>
1	1	1 1/2	4	<b>56317</b>

## variFLUTE® SPEEDS & FEEDS

Workpiece Material	Hardness BHN	Type of Cut	Surface Speed (SFM)	FEED PER TOOTH BY END MILL DIAMETER				
				1/8"	1/4"	1/2"	3/4"	1"
Plain Steels - Low & Medium Carbon 1008, 1010, 1020	175	Profile Slot	500	0.0004	0.0013	0.0030	0.0038	0.0042
			400	0.0003	0.0010	0.0024	0.0030	0.0034
Plain Steels - Low & Medium Carbon 1008, 1010, 1020	275	Profile Slot	400	0.0004	0.0013	0.0030	0.0038	0.0042
			320	0.0003	0.0010	0.0024	0.0030	0.0034
Alloy Steels - Medium Carbon 4140, 4150, 4340	275	Profile Slot	400	0.0003	0.0010	0.0025	0.0035	0.0040
			320	0.0002	0.0008	0.0020	0.0028	0.0032
Alloy Steels - Medium Carbon 4140, 4150, 4340	375	Profile Slot	300	0.0003	0.0010	0.0025	0.0035	0.0040
			240	0.0002	0.0008	0.0020	0.0028	0.0032
Mold & Die Steels O1, A2, D2, H13, P20	275	Profile Slot	180	0.0002	0.0010	0.0025	0.0035	0.0040
			145	0.0002	0.0008	0.0020	0.0028	0.0032
Stainless Steels 300 Series 304, 310, 316	275	Profile Slot	300	0.0003	0.0010	0.0025	0.0035	0.0042
			240	0.0002	0.0008	0.0020	0.0028	0.0034
Stainless Steels 400 Series 409, 430, 436	325	Profile Slot	250	0.0003	0.0010	0.0025	0.0035	0.0042
			200	0.0002	0.0008	0.0020	0.0028	0.0034
Stainless Steels Precipitation Hardened 15-5PH, 17-4PH	325	Profile Slot	250	0.0002	0.0010	0.0022	0.0030	0.0040
			200	0.0002	0.0008	0.0018	0.0024	0.0032
High Temperature Alloys Inconel, Hastelloy, Waspaloy	300	Profile Slot	75	0.0002	0.0007	0.0020	0.0025	0.0032
			60	0.0002	0.0006	0.0016	0.0020	0.0026
Titanium Alloys Ti-6Al-4V, ASTM B367 Grades C-3, C-4	300	Profile Slot	300	0.0003	0.0010	0.0025	0.0027	0.0035
			240	0.0002	0.0008	0.0020	0.0022	0.0028
Cast Iron Grey	200	Profile Slot	550	0.0004	0.0012	0.0030	0.0038	0.0042
			440	0.0003	0.0010	0.0024	0.0030	0.0034
Cast Iron Ductile	300	Profile Slot	250	0.0003	0.0010	0.0030	0.0033	0.0042
			200	0.0002	0.0008	0.0024	0.0026	0.0034

SPEEDS and FEEDS are suggested starting points and may be increased or decreased depending on actual material and machining conditions. In pocketing operations ramping and spiral plunging are the preferred methods of entry. A 5° ramp angle at about 50% feed are suggested.

RECOMMENDED MAXIMUM DEPTHS OF CUT	PROFILING Radial Depth = .5XD Axial Depth = 1.5XD	SLOTING Axial Depth = 1XD
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May be increased or decreased depending on actual material and machining conditions.

HPE High Performance End Mills

# variFLUTE® NF

## Solid Carbide Variable Flute

### HPE Ultra-High Performance

### Single End Mills For Aluminum and Non-Ferrous Materials

**Center Cutting - 45° Helix Angle**  
**Premium Micrograin Carbide**  
**10% Cobalt Content**

High Performance Milling in Aluminum and Non-Ferrous Materials, Copper Alloys, Bronze/Brass

The Variable Flute Design reduces chatter and improves tool life. The high shear flute designed for rapid chip removal combined with an ultra high polish enable extremely high cutting rates and long tool life.

**ZrN - Zirconium Nitride** coating is a pale gold hard thin high-lubricity coating particularly well suited to machining non-ferrous materials including aluminum, copper alloys and brass.

**DLC, CrN**, and other high performance coatings also available.

**TOLERANCES:**

Diameter -.0001 / -.0003  
 Shank -.0001 / -.0003  
 Runout Less Than 0.0001 TIR



Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento



List No. 5990 & 5990Z 2-Flute — Standard Corner Radius



List No. 5991 & 5991Z 2-Flute — Square End



List No. 5992 & 5992Z 3-Flute — Standard Corner Radius



List No. 5993 & 5993Z 2-Flute — Ball End

**2-Flute** mills have greater chip capacity and are recommended for slotting and roughing operations.

**3-Flute** mills offer greater feed rates than two flute mills while still offering high chip capacity, recommended for profile applications.

**Corner Radius** strengthens the endmill and improves wear characteristics. Small .003- .007 radius enables use in most applications.

**List No. 5990 & 5990Z 2-Flute Standard Corner Radius**

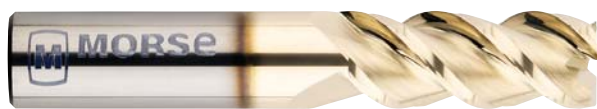
Dia.	Shank Dia.	Length Of Cut	OAL	Corner Radius	List No. 5990 Bright Finish EDP No.	List No. 5990Z ZrN Coated EDP No.
<b>STANDARD LENGTH</b>						
1/4	1/4	3/4	2-1/2	.003 - .005	<b>52900</b>	<b>92600</b>
5/16	5/16	3/4	2-1/2	.003 - .005	<b>52901</b>	<b>92601</b>
3/8	3/8	1	2-1/2	.003 - .005	<b>52902</b>	<b>92602</b>
1/2	1/2	1-1/4	3	.005 - .007	<b>52903</b>	<b>92603</b>
5/8	5/8	1-5/8	3-1/2	.005 - .007	<b>52904</b>	<b>92604</b>
3/4	3/4	1-3/4	4	.005 - .007	<b>52905</b>	<b>92605</b>
1	1	1-3/4	4	.005 - .007	<b>52906</b>	<b>92606</b>
<b>LONG LENGTH</b>						
1/4	1/4	1-1/4	3	.003 - .005	<b>52910</b>	<b>92610</b>
5/16	5/16	1-3/8	3	.003 - .005	<b>52911</b>	<b>92611</b>
3/8	3/8	1-1/2	3-1/2	.003 - .005	<b>52912</b>	<b>92612</b>
1/2	1/2	2	4	.005 - .007	<b>52913</b>	<b>92613</b>
5/8	5/8	2-3/8	5	.005 - .007	<b>52914</b>	<b>92614</b>
3/4	3/4	2-1/2	5	.005 - .007	<b>52915</b>	<b>92615</b>
1	1	3	6	.005 - .007	<b>52916</b>	<b>92616</b>

Speeds & Feeds: Page 204

# variFLUTE® NF

## Solid Carbide High Performance End Mills for Aluminum and Non Ferrous Materials

Fraise à queue à rainurer à haut rendement au carbure  
Cortador vertical de carburo de alto rendimiento



**Corner Radius** strengthens the end mill and improves wear characteristics. Small .003- .007 radius enables use in most applications.

**ZrN - Zirconium Nitride** coating is a pale gold hard thin high-lubricity coating particularly well suited to machining non-ferrous materials including aluminum, copper alloys and brass.

**DLC, CrN,** and other high performance coatings also available.

### List No. 5992 & 5992Z 3-Flute Standard Corner Radius

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	CORNER RADIUS	LIST NO. 5992 BRIGHT FINISH EDP NO.	LIST NO. 5992Z ZrN COATED EDP NO.
<b>STANDARD LENGTH</b>						
1/4	1/4	3/4	2-1/2	.003 - .005	<b>52930</b>	<b>92630</b>
5/16	5/16	3/4	2-1/2	.003 - .005	<b>52931</b>	<b>92631</b>
3/8	3/8	1	2-1/2	.003 - .005	<b>52932</b>	<b>92632</b>
1/2	1/2	1-1/4	3	.005 - .007	<b>52933</b>	<b>92633</b>
5/8	5/8	1-5/8	3-1/2	.005 - .007	<b>52934</b>	<b>92634</b>
3/4	3/4	1-3/4	4	.005 - .007	<b>52935</b>	<b>92635</b>
1	1	1-3/4	4	.005 - .007	<b>52936</b>	<b>92636</b>
<b>LONG LENGTH</b>						
1/4	1/4	1-1/4	3	.003 - .005	<b>52940</b>	<b>92940</b>
5/16	5/16	1-3/8	3	.003 - .005	<b>52941</b>	<b>92941</b>
3/8	3/8	1-1/2	3-1/2	.003 - .005	<b>52942</b>	<b>92942</b>
1/2	1/2	2	4	.005 - .007	<b>52943</b>	<b>92943</b>
5/8	5/8	2-3/8	5	.005 - .007	<b>52944</b>	<b>92944</b>
3/4	3/4	2-1/2	5	.005 - .007	<b>52945</b>	<b>92945</b>
1	1	3	6	.005 - .007	<b>52946</b>	<b>92946</b>

Speeds & Feeds: Page 204



**Square End** for milling and finishing where a sharp corner is required

**ZrN - Zirconium Nitride** coating is a pale gold hard thin high-lubricity coating particularly well suited to machining non-ferrous materials including aluminum, copper alloys and brass.

**DLC, CrN,** and other high performance coatings also available.

### List No. 5991 & 5991Z 2-Flute Square End

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	LIST NO. 5991 BRIGHT FINISH EDP NO.	LIST NO. 5991Z ZrN COATED EDP NO.
<b>STANDARD LENGTH</b>					
1/4	1/4	3/4	2-1/2	<b>52920</b>	<b>92920</b>
5/16	5/16	3/4	2-1/2	<b>52921</b>	<b>92921</b>
3/8	3/8	1	2-1/2	<b>52922</b>	<b>92922</b>
1/2	1/2	1-1/4	3	<b>52923</b>	<b>92923</b>
5/8	5/8	1-5/8	3-1/2	<b>52924</b>	<b>92924</b>
3/4	3/4	1-3/4	4	<b>52925</b>	<b>92925</b>
1	1	1-3/4	4	<b>52926</b>	<b>92926</b>

HPE High Performance End Mills

# variFLUTE® NF

## Solid Carbide High Performance End Mills for Aluminum and Non Ferrous Materials



Fraise à queue à rainurer à haut rendement au carbure

Cortador vertical de carburo de alto rendimiento

**Ball End** for use in contour milling, radius bottom slots, fillets, and cavity milling.

**ZrN - Zirconium Nitride** coating is a pale gold hard thin high-lubricity coating particularly well suited to machining non-ferrous materials including aluminum, copper alloys and brass.

**DLC, CrN,** and other high performance coatings also available.

### List No. 5993 & 5993Z 2-Flute Ball End

DIA.	SHANK DIA.	LENGTH OF CUT	OAL	LIST NO. 5993	LIST NO. 5993Z
				BRIGHT FINISH EDP NO.	ZrN COATED EDP NO.
<b>STANDARD LENGTH</b>					
1/4	1/4	3/4	2-1/2	<b>52950</b>	<b>92650</b>
5/16	5/16	3/4	2-1/2	<b>52951</b>	<b>92651</b>
3/8	3/8	1	2-1/2	<b>52952</b>	<b>92652</b>
1/2	1/2	1-1/4	3	<b>52953</b>	<b>92653</b>
5/8	5/8	1-5/8	3-1/2	<b>52954</b>	<b>92654</b>
3/4	3/4	1-3/4	4	<b>52955</b>	<b>92655</b>
1	1	1-3/4	4	<b>52956</b>	<b>92656</b>

variFLUTE® NF SPEEDS & FEEDS								
MATERIAL	CUTTING SPEED SFM M/MIN	CHIP LOAD PER TOOTH IN / MM						
		1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	1"
Aluminum	1600" - 2000" 490mm - 610mm	0.003" 0.08mm	0.004" 0.10mm	0.005" 0.13mm	0.006" 0.15mm	0.007" 0.18mm	0.008" 0.20mm	0.010" 0.25mm
Copper Alloys	800" - 1200" 240mm - 365mm	0.003" 0.08mm	0.004" 0.10mm	0.005" 0.13mm	0.006" 0.15mm	0.007" 0.18mm	0.008" 0.20mm	0.010" 0.25mm
Brass/Bronze	800" - 1500" 240mm - 460mm	0.003" 0.08mm	0.004" 0.10mm	0.005" 0.13mm	0.006" 0.15mm	0.007" 0.18mm	0.008" 0.20mm	0.010" 0.25mm
Plastics	1200" - 1600" 365mm - 490mm	0.006" 0.16mm	0.008" 0.20mm	0.010" 0.26mm	0.012" 0.30mm	0.014" 0.36mm	0.016" 0.40mm	0.020" 0.50mm

Morse variFLUTE NF mills are capable of very high removal rates.

- Proper coolant under sufficient volume and pressure is important for optimal performance.
- High quality balanced tool holding is recommended.
- Increase chip load based on available machine capability.

RECOMMENDED MAXIMUM DEPTHS OF CUT	PROFILING Radial Depth = .5XD Axial Depth = 1.5XD	SLOTING Axial Depth = 1XD
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**SPEEDS and FEEDS** are suggested starting points and may be increased or decreased depending on actual material and machining conditions.

# Standard Solid Carbide End Mill Speed and Feed Recommendations

WORKPIECE MATERIAL	TYPE OF CUT	SURFACE SPEED (SFM)	FEED PER TOOTH BY END MILL DIAMETER				
			1/8"	1/4"	1/2"	3/4"	1"
Low Carbon Steel ≤ 40 Rc 1018, 12L12, 1108, 1213	Profile	275	0.0006	0.0012	0.0025	0.0037	0.0050
	Slot	220	0.0005	0.0010	0.0020	0.0030	0.0040
Medium Carbon Steel ≤ 40 Rc 1040, 1140, 4340, 8640	Profile	250	0.0006	0.0012	0.0025	0.0037	0.0050
	Slot	200	0.0005	0.0010	0.0020	0.0030	0.0040
Tool and Die Steels ≤ 40 Rc P20, A2, D2, H12	Profile	250	0.0006	0.0012	0.0025	0.0037	0.0050
	Slot	200	0.0005	0.0010	0.0020	0.0030	0.0040
Tool and Die Steels > 40 & ≤ 50 Rc P20, A2, D2, H12	Profile	200	0.0003	0.0007	0.0015	0.0022	0.0030
	Slot	160	0.0002	0.0006	0.0012	0.0018	0.0024
Free Machining Stainless Steels 303, 410, 416, 440F	Profile	250	0.0005	0.0010	0.0020	0.0030	0.0040
	Slot	200	0.0004	0.0008	0.0016	0.0024	0.0032
Moderate Machining Stainless Steels 304, 316	Profile	225	0.0003	0.0007	0.0015	0.0022	0.0030
	Slot	180	0.0002	0.0006	0.0012	0.0018	0.0024
Difficult Machining Stainless Steels 17-4PH, 316L, AM350	Profile	150	0.0002	0.0006	0.0012	0.0018	0.0024
	Slot	120	0.0002	0.0004	0.0010	0.0014	0.0019
Cast Iron Gray	Profile	300	0.0005	0.0010	0.0020	0.0030	0.0040
	Slot	240	0.0004	0.0008	0.0016	0.0024	0.0032
Cast Iron Ductile	Profile	250	0.0005	0.0010	0.0020	0.0030	0.0040
	Slot	200	0.0004	0.0008	0.0016	0.0024	0.0032
Cast Iron Malleable	Profile	200	0.0005	0.0011	0.0022	0.0033	0.0044
	Slot	160	0.0004	0.0009	0.0018	0.0026	0.0035
Titanium Alloys Ti-6Al-4V, ASTM B367 Grades C-3, C-4	Profile	125	0.0005	0.0010	0.0020	0.0040	0.0060
	Slot	100	0.0004	0.0008	0.0016	0.0032	0.0048
High Temperature Alloys Inconel, Hastelloy, Waspaloy	Profile	90	0.0005	0.0011	0.0022	0.0033	0.0044
	Slot	70	0.0004	0.0009	0.0018	0.0026	0.0035
Aluminum Alloys 2025, 6061, A140, 514.0	Profile	650	0.0010	0.0020	0.0040	0.0060	0.0080
	Slot	520	0.0008	0.0016	0.0032	0.0048	0.0064
Copper Alloys Brass and Bronze	Profile	300	0.0008	0.0015	0.0030	0.0047	0.0060
	Slot	240	0.0006	0.0012	0.0024	0.0038	0.0048
Composites & Plastics	Profile	375	0.0009	0.0018	0.0035	0.0055	0.0070
	Slot	300	0.0007	0.0014	0.0028	0.0044	0.0056
Magnesium Alloys AZ80A, HM12A, AM60A, ZE41A	Profile	450	0.0010	0.0020	0.0040	0.0060	0.0080
	Slot	360	0.0008	0.0016	0.0032	0.0048	0.0064
Graphite	Profile	450	0.0009	0.0018	0.0035	0.0055	0.0070
	Slot	360	0.0007	0.0014	0.0028	0.0044	0.0056

SPEEDS and FEEDS are suggested starting points and may be increased or decreased depending on actual material and machining conditions.

In general, use lower speeds and feeds for hard and difficult-to-machine materials. Use higher speeds and feeds for easy-to-machine materials. Use higher surface speed for lighter cuts, smaller tools, and better finishes. Higher feed rates can improve tool life and performance in softer materials and more abrasive materials.

For long and extra long tools reduce feed rates by 50%.

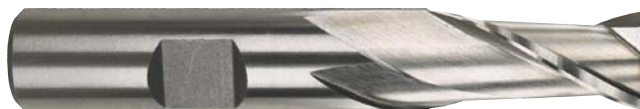
For TiN and TiCN coated tools, increase speed by up to 20% with the feed rate unchanged. For TiAlN coated tools, speeds may be increased by up to 50% with the feed rate unchanged.

# 2-Flute Single End Mills

Fraise à queue à rainurer simple

cortador vertical sencillloe

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting



**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

List No. 1898 High Speed Steel  
List No. 1898G High Speed Steel TiN Coated  
List No. 4580 M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

STANDARD PACKAGE All sizes — 1 each

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

Tool Coatings  
Also Available

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1898	1898G	4580
					High Speed Steel EDP NO.	High Speed Steel TIN COATED EDP NO.	COBALT EDP NO.
1/8	.1250	3/8	3/8	2 5/16	43651	96150	44376
5/32	.1562	3/8	7/16	2 5/16	43691	96152	44387
1 1/64	.1719	3/8	7/16	2 5/16	43705	—	—
3/16	.1875	3/8	7/16	2 5/16	43652	96154	44377
13/64	.2031	3/8	1/2	2 5/16	43706	—	—
7/32	.2187	3/8	1/2	2 3/8	43692	96156	44388
15/64	.2344	3/8	1/2	2 5/16	43707	—	—
1/4	.2500	3/8	1/2	2 5/16	43653	96158	44378
17/64	.2656	3/8	9/16	2 5/16	43708	—	—
9/32	.2812	3/8	9/16	2 3/8	43693	96160	44389
19/64	.2969	3/8	9/16	2 5/16	43709	—	—
5/16	.3125	3/8	9/16	2 5/16	43654	96162	44379
21/64	.3281	3/8	9/16	2 5/16	43710	—	—
11/32	.3437	3/8	9/16	2 5/16	43694	96164	—
23/64	.3594	3/8	9/16	2 5/16	43711	—	—
3/8	.3750	3/8	9/16	2 5/16	43655	96166	44380
25/64	.3906	3/8	13/16	2 1/2	43712	—	—
13/32	.4062	3/8	13/16	2 1/2	43695	96168	44391
27/64	.4219	3/8	13/16	2 1/2	43713	—	—
7/16	.4375	3/8	13/16	2 1/2	43656	96170	44392
15/32	.4687	1/2	13/16	3	43696	96172	44393
31/64	.4844	1/2	13/16	3	43715	—	—
1/2	.5000	3/8	13/16	2 1/2	43657	96183	—
1/2	.5000	1/2	1	3	43658	96174	44381
39/64	.5156	1/2	1	3	43716	—	—
17/32	.5312	1/2	1 1/8	3 1/8	43697	96184	—
35/64	.5469	1/2	1 1/8	3 1/8	43717	—	—
9/16	.5625	1/2	1 1/8	3 1/8	43659	96185	44394

(continued)



# 2-Flute Single End Mills (continued)

Fraise à queue à rainurer simple

cortador vertical sencillo

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1898	1898G	4580
					High Speed Steel EDP NO.	High Speed Steel TIN COATED EDP NO.	COBALT EDP NO.
37/64	.5781	1/2	1 1/8	3 1/8	43718	—	—
19/32	.5937	1/2	1 1/8	3 1/8	43698	—	—
39/64	.6094	1/2	1 1/8	3 1/8	43719	—	—
5/8	.6250	1/2	1 1/8	3 1/8	43660	96186	—
5/8	.6250	5/8	1 5/16	3 7/16	43661	96176	44382
1 1/16	.6875	1/2	1 5/16	3 9/16	43662	—	—
1 1/16	.6875	5/8	1 5/16	3 7/16	43663	96187	—
3/4	.7500	1/2	1 5/16	3 7/16	43664	—	—
3/4	.7500	5/8	1 5/16	3 7/16	43665	96188	—
3/4	.7500	3/4	1 5/16	3 9/16	43666	96178	44383
13/16	.8125	5/8	1 1/2	3 9/8	43667	—	—
13/16	.8125	3/4	1 1/2	3 3/4	43668	96189	—
7/8	.8750	5/8	1 1/2	3 3/4	43669	—	—
7/8	.8750	3/4	1 1/2	3 3/4	43670	96190	44395
7/8	.8750	7/8	1 1/2	3 3/4	43671	96191	—
15/16	.9375	5/8	1 1/2	3 3/4	43672	—	—
15/16	.9375	3/4	1 1/2	3 3/4	43673	—	—
15/16	.9375	7/8	1 1/2	3 3/4	43674	—	—
1	1.0000	5/8	1 1/2	3 3/4	43675	—	—
1	1.0000	3/4	1 1/2	3 3/4	43676	96192	44396
1	1.0000	7/8	1 1/2	3 3/4	43677	—	—
1	1.0000	1	1 5/8	4 1/8	43678	96182	44384
1 1/8	1.1250	3/4	1 5/8	3 7/8	43720	—	—
1 1/8	1.1250	7/8	1 5/8	3 7/8	43679	—	—
1 1/8	1.1250	1	1 5/8	4 1/8	43680	96193	—
1 1/4	1.2500	3/4	1 5/8	3 7/8	43721	—	—
1 1/4	1.2500	7/8	1 5/8	3 7/8	43681	—	—
1 1/4	1.2500	1	1 5/8	4 1/8	43682	96194	—
1 1/4	1.2500	1 1/4	1 5/8	4 1/8	43683	—	44385
1 3/8	1.3750	3/4	1 5/8	3 7/8	43722	—	—
1 3/8	1.3750	1	1 5/8	4 1/8	43684	96195	—
1 1/2	1.5000	3/4	1 5/8	3 7/8	43723	—	—
1 1/2	1.5000	1	1 5/8	4 1/8	43685	—	—
1 1/2	1.5000	1 1/4	1 5/8	4 1/8	43686	96196	44386
1 5/8	1.6250	1 1/4	1 5/8	4 1/8	43687	—	—
1 3/4	1.7500	3/4	1 5/8	3 7/8	43724	—	—
1 3/4	1.7500	1 1/4	1 5/8	4 1/8	43688	—	—
1 7/8	1.8750	1 1/4	1 5/8	4 1/8	43689	—	—
2	2.0000	1 1/4	1 5/8	4 1/8	43690	—	—

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

# 2-Flute Long Length Single End Mills

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting

**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**Long Length** end mills provide a longer length of cut for deeper milling applications

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

Fraise à queue à rainurer longue

cortador vertical largo



List No. 4599 High Speed Steel  
List No. 4599G High Speed Steel TiN Coated  
List No. 4584 M42 8% Cobalt

STANDARD PACKAGE All sizes — 1 each

Tool Coatings  
Also Available

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	4599	4599G	4584
					High Speed Steel EDP NO.	High Speed Steel TIN COATED EDP NO.	COBALT EDP NO.
3/16	.1875	3/8	1 1/4	3 1/16	43001	96200	—
7/32	.2188	3/8	1 1/4	3 1/16	43002	—	—
1/4	.2500	3/8	1 1/4	3 1/16	43003	96201	—
9/32	.2812	3/8	1 3/8	3 3/8	43005	—	—
5/16	.3125	3/8	1 3/8	3 3/8	43006	96202	—
1 1/32	.3438	3/8	1 1/2	3 3/4	43007	—	—
3/8	.3750	3/8	1 1/2	3 3/4	44601	96203	45370
7/16	.4375	1/2	1 3/4	3 3/4	43009	96204	—
15/32	.4688	1/2	2	4	43010*	—	—
1/2	.5000	1/2	2	4	44602	96205	45371
5/8	.6250	5/8	2	4 1/8	44603	96206	45372
3/4	.7500	3/4	2 1/4	4 1/2	44604	96207	45373
13/16	.8125	7/8	2 1/2	4 3/4	43013*	—	—
7/8	.8750	7/8	2 1/2	4 3/4	44605	96208	—
1	1.0000	1	3	5 1/2	44606	96209	45374
1 1/8	1.1250	1	3	5 1/2	44607	—	—
1 1/4	1.2500	1	3	5 1/2	44608	—	—
1 1/4	1.2500	1 1/4	3	5 1/2	44609	—	—
1 3/8	1.3750	1	3	5 1/2	44610	—	—
1 1/2	1.5000	1 1/4	3	5 1/2	44611	—	—

\* Available While Supplies Last

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# 2-Flute Extended Length Single End Mills

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting

**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**Extended Length** end mills are recommended for applications that require a longer reach but not a longer length of cut. The increased rigidity of the unfluted extended shank reduces deflection.

Fraise à queue à rainurer longue

cortador vertical largo



List No. 1899 High Speed Steel  
List No. 1899G High Speed Steel TiN Coated  
List No. 4585 M42 8% Cobalt

STANDARD PACKAGE All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	LENGTH BELOW SHANK	OAL	1899 High Speed Steel EDP NO.	1899G High Speed Steel TIN COATED EDP NO.	4585 COBALT EDP NO.
1/8	.1250	3/8	3/8	13/16	29/16	43749	96215	45380*
3/16	.1875	3/8	1/2	1 1/8	2 11/16	43750	96216	45381*
1/4	.2500	3/8	5/8	1 1/2	3 1/16	43751	96217	—
5/16	.3125	3/8	3/4	1 3/4	3 5/16	43752	96218	45383*
3/8	.3750	3/8	3/4	1 3/4	3 5/16	43753	96219	45384*
1/2	.5000	1/2	1	2 1/4	4	43754	96221	45385*
5/8	.6250	5/8	1 3/8	2 3/4	4 5/8	43755	96222	—
3/4	.7500	3/4	1 5/8	3 3/8	5 3/8	43756	96223	—
1	1.0000	1	2 1/2	5	7 1/4	43757	96225	—

\* Available While Supplies Last

# Metric 2-Flute Single End Mills

High Speed Steel  
Center Cutting

**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise à queue à rainurer simple

cortador vertical sencillor



List No. 1898M

STANDARD PACKAGE All sizes — 1 each

DIA. MM	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.	DIA. MM	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
3.0	.1181	3/8	3/8	2 5/16	43339	14.0	.5512	1/2	1 1/8	3 1/8	43319
4.0	.1575	3/8	7/16	2 5/16	43340	15.0	.5906	1/2	1 1/8	3 1/8	43321
5.0	.1968	3/8	1/2	2 5/16	43333	16.0	.6299	5/8	1 5/16	3 7/16	43322
6.0	.2362	3/8	1/2	2 5/16	43335	17.0	.6693	5/8	1 5/16	3 7/16	43323
7.0	.2756	3/8	9/16	2 5/16	43337	18.0	.7087	5/8	1 5/16	3 7/16	43324
8.0	.3150	3/8	9/16	2 5/16	43307	19.0	.7480	3/4	1 5/8	3 3/8	43325
9.0	.3543	3/8	9/16	2 5/16	43309	20.0	.7874	3/4	1 1/2	3 3/4	43326
10.0	.3937	3/8	1 3/16	2 1/2	43311	22.0	.8661	3/4	1 1/2	3 3/4	43328
11.0	.4331	3/8	1 3/16	2 1/2	43313	23.0	.9055	7/8	1 7/8	4 1/8	43329
12.0	.4724	3/8	1 3/16	2 1/2	43315	24.0	.9449	1	2	4 1/2	43330
13.0	.5118	1/2	1 1/8	3 1/8	43317	25.0	.9843	1	2	4 1/2	43331

Tool Coatings Also Available

# DRILL-MILL™

## M42 8% Cobalt

Specially designed to perform both drilling and milling operations with the same tool in vertical milling machine applications. Increased productivity with fewer tool changes.

**DRILL-MILL performs:** drilling, spotting countersinking, chamfering, slotting, side milling, profile milling and other drilling & milling operations

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH* OF CUT	OAL*	EDP NO.
1/8	.1250	3/8	3/8	2 <sup>5</sup> / <sub>16</sub>	<b>44619</b>
3/16	.1875	3/8	7/16	2 <sup>5</sup> / <sub>16</sub>	<b>44620</b>
1/4	.2500	3/8	5/8	2 <sup>7</sup> / <sub>16</sub>	<b>44621</b>
5/16	.3125	3/8	2 <sup>3</sup> / <sub>32</sub>	2 <sup>15</sup> / <sub>32</sub>	<b>44622</b>
3/8	.3750	3/8	3/4	2 <sup>1</sup> / <sub>2</sub>	<b>44623</b>
7/16	.4375	3/8	1 <sup>1</sup> / <sub>32</sub>	2 <sup>23</sup> / <sub>32</sub>	<b>44624</b>
1/2	.5000	1/2	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>44625</b>

\* Lengths include the 90° conical cutting point.

## High Helix 2-Flute Single End Mills

### High Speed Steel — Center Cutting 37° Helix Angle

**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**High Helix** end mills are recommended for aluminum, magnesium, zinc alloys and other soft non-ferrous materials. The higher helix angle provides a positive smoother cutting shearing action and enhanced chip evacuation.



### List No. 1920 Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/4	.2500	3/8	5/8	2 <sup>7</sup> / <sub>16</sub>	<b>44021</b>
5/16	.3125	3/8	3/4	2 <sup>1</sup> / <sub>2</sub>	<b>44022</b>
3/8	.3750	3/8	3/4	2 <sup>1</sup> / <sub>2</sub>	<b>44023</b>
7/16	.4375	3/8	1	2 <sup>11</sup> / <sub>16</sub>	<b>44024</b>
1/2	.5000	1/2	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>44025</b>
5/8	.6250	5/8	1 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>44026</b>
3/4	.7500	3/4	1 <sup>5</sup> / <sub>8</sub>	3 <sup>7</sup> / <sub>8</sub>	<b>44027</b>
7/8	.8750	7/8	1 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	<b>44028</b>
1	1.0000	1	2	4 <sup>1</sup> / <sub>2</sub>	<b>44029</b>
1 <sup>1</sup> / <sub>4</sub>	1.2500	1 <sup>1</sup> / <sub>4</sub>	2	4 <sup>1</sup> / <sub>2</sub>	<b>44030*</b>

\* Available While Supplies Last

Fraise de forage

Broca de fresado



List No. 1980

90° Point Angle  
2-Flute

30° Right Hand Helix

Tool Coatings  
Also Available

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH* OF CUT	OAL*	EDP NO.
9/16	.5625	1/2	1 <sup>13</sup> / <sub>32</sub>	3 <sup>13</sup> / <sub>32</sub>	<b>44626</b>
5/8	.6250	5/8	1 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>44627</b>
1 <sup>1</sup> / <sub>16</sub>	.6875	5/8	1 <sup>21</sup> / <sub>32</sub>	3 <sup>25</sup> / <sub>32</sub>	<b>44628</b>
3/4	.7500	3/4	1 <sup>11</sup> / <sub>16</sub>	3 <sup>15</sup> / <sub>16</sub>	<b>44629</b>
13/16	.8125	3/4	1 <sup>29</sup> / <sub>32</sub>	4 <sup>5</sup> / <sub>32</sub>	<b>44630</b>
7/8	.8750	3/4	1 <sup>15</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	<b>44631</b>
15/16	.9375	3/4	1 <sup>31</sup> / <sub>32</sub>	4 <sup>7</sup> / <sub>32</sub>	<b>44632</b>
1	1.0000	3/4	2	4 <sup>1</sup> / <sub>4</sub>	<b>44633</b>

Fraise à queue à rainurer à hélice serrée

cortador vertical con hélice alta



### List No. 1921 Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/4	.2500	3/8	1 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>	<b>44051</b>
5/16	.3125	3/8	1 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	<b>44052</b>
3/8	.3750	3/8	1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	<b>44053</b>
7/16	.4375	1/2	1 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	<b>44054</b>
1/2	.5000	1/2	2	4	<b>44055</b>
5/8	.6250	5/8	2 <sup>1</sup> / <sub>2</sub>	4 <sup>5</sup> / <sub>8</sub>	<b>44056</b>
3/4	.7500	3/4	3	5 <sup>1</sup> / <sub>4</sub>	<b>44057</b>
7/8	.8750	7/8	3 <sup>1</sup> / <sub>2</sub>	5 <sup>3</sup> / <sub>4</sub>	<b>44058*</b>
1	1.0000	1	4	6 <sup>1</sup> / <sub>2</sub>	<b>44059</b>
1 <sup>1</sup> / <sub>2</sub>	1.5000	1 <sup>1</sup> / <sub>4</sub>	4	6 <sup>1</sup> / <sub>2</sub>	<b>44061*</b>
2	2.0000	1 <sup>1</sup> / <sub>4</sub>	4	6 <sup>1</sup> / <sub>2</sub>	<b>44062*</b>



### List No. 1922 Extra Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/4	.2500	3/8	1 <sup>3</sup> / <sub>4</sub>	3 <sup>9</sup> / <sub>16</sub>	<b>44076</b>
5/16	.3125	3/8	2	3 <sup>3</sup> / <sub>4</sub>	<b>44077</b>
3/8	.3750	3/8	2 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	<b>44078</b>
1/2	.5000	1/2	3	5	<b>44079</b>
5/8	.6250	5/8	4	6 <sup>1</sup> / <sub>8</sub>	<b>44080</b>
3/4	.7500	3/4	4	6 <sup>1</sup> / <sub>4</sub>	<b>44081</b>
1	1.0000	1	6	8 <sup>1</sup> / <sub>2</sub>	<b>44082</b>

# 2-Flute

Fraise à queue à rainurer double

cortador vertical doble

## Double End Mills

High Speed Steel & M42 8% Cobalt

Bright Finish & TiN Coated

Center Cutting

2-Flute end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.



List No. 1896 High Speed Steel

List No. 1896G High Speed Steel TiN Coated

List No. 4581 M42 8% Cobalt

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1896	1896G	4581
					High Speed Steel	High Speed Steel TIN COATED	COBALT
					EDP NO.	EDP NO.	EDP NO.
1/8	.1250	3/8	3/8	3 1/16	43412	96050	44560
9/64	.1406	3/8	7/16	3 3/8	43431	—	—
5/32	.1562	3/8	7/16	3 3/8	43413	96052	44561
11/64	.1719	3/8	7/16	3 3/8	43432	—	—
3/16	.1875	3/8	7/16	3 3/8	43414	96054	44562
13/64	.2031	3/8	1/2	3 3/8	43433	—	—
7/32	.2188	3/8	1/2	3 3/8	43415	96056	44563
15/64	.2344	3/8	1/2	3 3/8	43434	—	—
1/4	.2500	3/8	1/2	3 3/8	43416	96058	44564
17/64	.2656	3/8	9/16	3 3/8	43435	—	—
9/32	.2812	3/8	9/16	3 3/8	43417	96060	44565
19/64	.2969	3/8	9/16	3 3/8	43436	—	—
5/16	.3125	3/8	9/16	3 3/8	43418	96062	44566
21/64	.3281	3/8	9/16	3 3/8	43437	—	—
11/32	.3438	3/8	9/16	3 3/8	43419	96064	44567
23/64	.3594	3/8	9/16	3 3/8	43438	—	—
3/8	.3750	3/8	9/16	3 3/8	43420	96066	44568
25/64	.3906	1/2	13/16	3 3/4	43439	—	—
13/32	.4062	1/2	13/16	3 3/4	43421	96068	44569
27/64	.4219	1/2	13/16	3 3/4	43440	—	—
7/16	.4375	1/2	13/16	3 3/4	43422	96070	44570
29/64	.4531	1/2	13/16	3 3/4	43441	—	—
15/32	.4688	1/2	13/16	3 3/4	43423	96072	—
31/64	.4844	1/2	13/16	3 3/4	43442	—	—
1/2	.5000	1/2	13/16	3 3/4	43424	96074	44571
9/16	.5625	5/8	1 1/8	5	43425	96075	44572
5/8	.6250	5/8	1 1/8	5	43426	96076	44573
11/16	.6875	3/4	1 5/16	5	43427	96077	44577
23/32	.7188	3/4	1 5/16	5	43446*	—	—
3/4	.7500	3/4	1 5/16	5	43428	96078	44574
13/16	.8125	7/8	1 9/16	5 1/2	43448	—	—
27/32	.8438	7/8	1 9/16	5 1/2	43449*	—	—
7/8	.8750	7/8	1 9/16	5 1/2	43429	—	44575*
29/32	.9062	1	1 9/8	5 7/8	43450*	—	—
15/16	.9375	1	1 9/8	5 7/8	43451*	—	—
31/32	.9688	1	1 9/8	5 7/8	43452*	—	—
1	1.0000	1	1 9/8	5 7/8	43430	96082	44576*

\* Available While Supplies Last

## 2-Flute Miniature Stub Length Double End Mills

3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

Fraise à queue à rainurer double

cortador vertical doble



List No. 4571 High Speed Steel

List No. 4571C M42 8% Cobalt

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	4571	4571C
				High Speed Steel EDP NO.	COBALT EDP NO.
1/32	.0312	3/64	2	44326	44360
3/64	.0469	1/16	2	44327	44361
1/16	.0625	3/32	2	44328	44362
5/64	.0781	1/8	2	44329	44363
3/32	.0938	9/64	2	44330	44364
7/64	.1094	5/32	2	44331	44365
1/8	.1250	3/16	2	44332	44366
9/64	.1406	7/32	2	44333	44367
5/32	.1562	15/64	2	44334	44368
11/64	.1719	1/4	2	44335	44369
3/16	.1875	9/32	2	44336	44370

## 2-Flute Miniature Regular Length Double End Mills

3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

Fraise à queue à rainurer double

cortador vertical doble



List No. 1896 High Speed Steel

List No. 1896C M42 8% Cobalt

Tool Coatings  
Also Available

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	1896	1896C
				High Speed Steel EDP NO.	COBALT EDP NO.
1/32	.0312	3/32	2 1/4	43401	44348
3/64	.0469	9/64	2 1/4	43402	44349
1/16	.0625	3/16	2 1/4	43403	44350
5/64	.0781	15/64	2 1/4	43404	44351
3/32	.0938	9/32	2 1/4	43405	44352
7/64	.1094	21/64	2 1/4	43406	44353
1/8	.1250	3/8	2 1/4	43407	44354
9/64	.1406	13/32	2 1/4	43408	44355
5/32	.1562	7/16	2 1/4	43409	44356
11/64	.1719	1/2	2 1/4	43410	44357
3/16	.1875	1/2	2 1/4	43411	44358

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

## 2-Flute Miniature Long Length Double End Mills

3/16" Dia. Shank — Center Cutting High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

Fraise à queue à rainurer double

cortador vertical doble



List No. 1894 High Speed Steel

List No. 1894C M42 8% Cobalt

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	1894	1894C
				High Speed Steel EDP NO.	COBALT EDP NO.
1/16	.0625	7/32	2 1/2	43251	43256
3/32	.0938	9/32	2 5/8	43252	43257
1/8	.1250	3/4	3 1/8	43253	43258
5/32	.1562	7/8	3 1/4	43254	43259
3/16	.1875	1	3 3/8	43255	43260

## 2-Flute Stub Length Double End Mills

High Speed Steel — Center Cutting

**2-Flute** end mills provide increased chip capacity and are recommended for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**Stub Length** provides increased rigidity when milling shallow slots, keyways and pockets.

**STANDARD PACKAGE** All sizes — 1 each

Fraise à queue à rainurer double

cortador vertical doble



List No. 4563 High Speed Steel

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/8	.1250	3/8	3/16	2 3/4	44313
5/32	.1562	3/8	15/64	2 3/4	44314
3/16	.1875	3/8	9/32	2 3/4	44315
7/32	.2188	3/8	21/64	2 3/4	44316
1/4	.2500	3/8	3/8	2 3/4	44317

### TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

# SHEARMILL™

## M42 8% Cobalt

### 3-Flute 60° High Helix

### Single End Mills

Center Cutting

High Spiral Design Cuts  
Cleanly & Efficiently

**Tool Coatings  
Also Available**

M42 8% Cobalt offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

Fraise à queue à rainurer à haut rendement  
cortador vertical de alto rendimiento



List No. 4686

60° High Helix angle keeps the cutting edges constantly engaged in the workpiece reducing cutting load variations. The result is a clean efficient cutting action with decreased cutting resistance, enhanced chip control, excellent surface finish and long tool life.

Recommended for tough milling jobs including stainless steel, titanium, inconel, mold and die steels and other abrasive and difficult materials. Center Cutting end allows for plunge cutting like a drill into solid material.

STANDARD PACKAGE All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
3/8	.3750	3/8	1 1/2	3 1/4	42919*
1/2	.5000	1/2	3	5	42922*
7/8	.8750	3/4	1 7/8	4 1/8	42944*
7/8	.8750	3/4	3 1/2	5 3/4	42945*
1	1.0000	1	4	6 1/2	42954*
1 1/4	1.2500	1	2	4 1/2	42970*

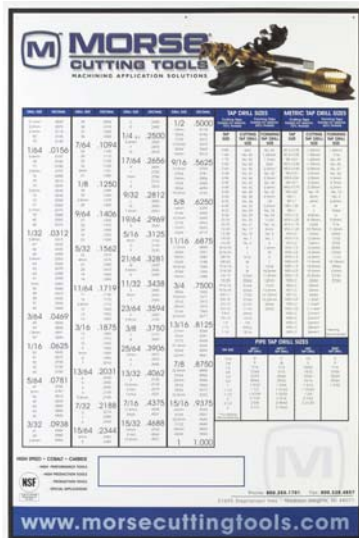
DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1 1/4	1.2500	1 1/4	2	4 1/2	42971*
1 1/2	1.5000	1 1/4	2	4 1/2	42980*
1 3/4	1.7500	1 1/4	2	4 1/2	42989*
2	2.0000	1 1/4	2	4 1/2	42995*
2	2.0000	2	2	5 3/4	43000*

\*Available While Supplies Last

## Morse® Plastic Wall Chart

Tableau mural

Tabla mural



NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650

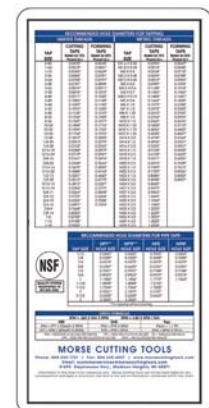
## Decimal Equivalent Pocket Chart

List No. 1005

Tableau décimal Tabla de medidas decimales

Front

Back



NEW LOOK! LARGER SIZE! Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. Size: 3 3/8" x 7", Printed on plastic

Pack of 50  
EDP No. 20412

Pack of 100  
EDP No. 20413



# 3-Flute Single End Mills

High Speed Steel  
Center Cutting

**3-Flute** end mills provide a compromise between the chip capacity of 2-flute end mills and the improved surface finish, greater core strength and higher feed rate of multi-flute end mills. They are recommended for general milling and for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

## List No. 1880 Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/8	.1250	3/8	3/8	25/16	42050
3/16	.1875	3/8	1/2	23/8	42051
1/4	.2500	3/8	5/8	27/16	42052
5/16	.3125	3/8	3/4	21/2	42053
3/8	.3750	3/8	3/4	21/2	42054
7/16	.4375	3/8	1	211/16	42055
1/2	.5000	3/8	1	211/16	42056
1/2	.5000	1/2	1 1/4	3 1/4	42057
9/16	.5625	1/2	1 3/8	3 3/8	42058
5/8	.6250	1/2	1 3/8	3 3/8	42059
5/8	.6250	5/8	1 5/8	3 3/4	42060

## List No. 1881 Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/4	.2500	3/8	1 1/4	3 1/16	42080
5/16	.3125	3/8	1 3/8	3 1/8	42081
3/8	.3750	3/8	1 1/2	3 1/4	42082
7/16	.4375	1/2	1 3/4	3 3/4	42083
1/2	.5000	1/2	2	4	42084

Fraise à queue à rainurer simple

cortador vertical sencillioe



List No. 1880 - Regular Length



List No. 1881 - Long Length

STANDARD PACKAGE All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
3/4	.7500	3/4	1 5/8	3 7/8	42061
7/8	.8750	3/4	1 7/8	4 1/8	42062
7/8	.8750	7/8	1 7/8	4 1/8	42063
1	1.0000	3/4	1 7/8	4 1/8	42064
1	1.0000	1	2	4 1/2	42065
1 1/8	1.1250	1	2	4 1/2	42066
1 1/2	1.5000	1 1/4	2	4 1/2	42069
1 3/4	1.7500	1 1/4	2	4 1/2	42070*
2	2.0000	2	3	6 3/4	42071

\* Available While Supplies Last

# 3-Flute Double End Mills

High Speed Steel  
Center Cutting

**3-Flute** end mills provide a compromise between the chip capacity of 2-flute end mills and the improved surface finish, greater core strength and higher feed rate of multi-flute end mills. They are recommended for general milling and for milling slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise à queue à rainurer double

cortador vertical doble



List No. 1882

STANDARD PACKAGE All sizes — 1 each

Tool Coatings  
Also Available

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/8	.1250	3/8	3/8	3 1/16	42100
3/16	.1875	3/8	1/2	3 1/4	42101
1/4	.2500	3/8	5/8	3 3/8	42102
5/16	.3125	3/8	3/4	3 1/2	42103
3/8	.3750	3/8	3/4	3 1/2	42104
7/16	.4375	1/2	1	4 1/8	42105

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/2	.5000	1/2	1	4 1/8	42106
9/16	.5625	5/8	1 3/8	5	42107
5/8	.6250	5/8	1 3/8	5	42108
3/4	.7500	3/4	1 5/8	5 5/8	42109
7/8	.8750	7/8	1 7/8	6 1/8	42110

# Multi-Flute Single End Mills

High Speed Steel & M42 8% Cobalt

Bright Finish & TiN Coated

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

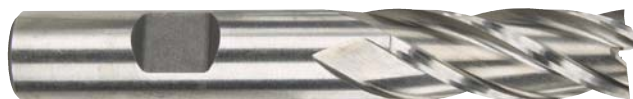
**Center Cutting** end allows for plunge cutting like a drill into solid material.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

Fraise à queue à rainurer simple

cortador vertical sencillor



- List No. 1897 High Speed Steel
- List No. 4550 High Speed Steel Center Cutting
- List No. 4550G High Speed Steel Center Cutting  
TiN Coated
- List No. 4586 M42 8% Cobalt Center Cutting

STANDARD PACKAGE All sizes — 1 each

**Tool Coatings  
Also Available**

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	1897	4550	4550G	4586
						High Speed Steel NON-CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING TIN COATED EDP NO.	COBALT CENTER CUTTING EDP NO.
1/8	.1250	3/8	3/8	25/16	4	43501	44135	96100	44426
5/32	.1562	3/8	7/16	25/16	4	43541	43021	96102	44415
11/64	.1719	3/8	1/2	23/8	4	43562	—	—	—
3/16	.1875	3/8	1/2	23/8	4	43502	44136	96104	44427
13/64	.2031	3/8	1/2	23/8	4	43563	—	—	—
7/32	.2188	3/8	1/2	23/8	4	43542	44149	96106	44416
15/64	.2344	3/8	5/8	27/16	4	43564	—	—	—
1/4	.2500	3/8	5/8	27/16	4	43503	44137	96108	44428
17/64	.2656	3/8	11/16	21/2	4	43565	—	—	—
9/32	.2812	3/8	11/16	21/2	4	43543	44150	96110	44417
19/64	.2969	3/8	3/4	21/2	4	43566	—	—	—
5/16	.3125	3/8	3/4	21/2	4	43504	44138	96112	44429
21/64	.3281	3/8	3/4	21/2	4	43567	—	—	—
11/32	.3438	3/8	3/4	21/2	4	43544	44151	96114	44418
23/64	.3594	3/8	3/4	21/2	4	43568	—	—	—
3/8	.3750	3/8	3/4	21/2	4	43505	44139	96116	44430
25/64	.3906	3/8	1	211/16	4	43569	—	—	—
13/32	.4062	3/8	1	211/16	4	43545	44152	96118	44419
27/64	.4219	3/8	1	211/16	4	43570	—	—	—
7/16	.4375	3/8	1	211/16	4	43506	44153	96120	44420
29/64	.4531	1/2	1 1/4	3 1/4	4	43571	—	—	—
15/32	.4688	1/2	1 1/4	3 1/4	4	43546	44154	96122	44421
31/64	.4844	1/2	1 1/4	3 1/4	4	43572	—	—	—
1/2	.5000	3/8	1	211/16	4	43507	43033	—	—
1/2	.5000	1/2	1 1/4	3 1/4	4	43508	44140	96124	44431
17/32	.5312	1/2	1 3/8	3 3/8	4	43547	44155	96096	—
9/16	.5625	1/2	1 3/8	3 3/8	4	43509	44156	96125	44422
19/32	.5938	1/2	1 3/8	3 3/8	4	43548	—	—	—
5/8	.6250	1/2	1 3/8	3 3/8	4	43510	43034	96098	—
5/8	.6250	5/8	1 5/8	3 3/4	4	43511	44141	96126	44432
5/8	.6250	5/8	1 5/8	3 3/4	6	—	—	—	44433
21/32	.6562	5/8	1 5/8	3 3/4	4	43549	—	—	—
11/16	.6875	1/2	1 5/8	3 5/8	4	43512	—	—	—
11/16	.6875	5/8	1 5/8	3 3/4	4	43513	44142	96127	—

(continued)

# Multi-Flute Single End Mills (continued)

Fraise à queue à rainurer simple

cortador vertical sencilloe

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	1897	4550	4550G	4586
						High Speed Steel NON-CENTER CUTTING	High Speed Steel CENTER CUTTING	High Speed Steel CENTER CUTTING TIN COATED	COBALT CENTER CUTTING
						EDP NO.	EDP NO.	EDP NO.	EDP NO.
23/32	.7188	1/2	1 5/8	3 5/8	4	43550	—	—	—
3/4	.7500	1/2	1 5/8	3 5/8	4	43514	—	—	—
3/4	.7500	5/8	1 5/8	3 3/4	4	43515	43035	96133	—
3/4	.7500	3/4	1 5/8	3 7/8	4	43516	44143	96128	44434
3/4	.7500	3/4	1 5/8	3 7/8	6	—	—	—	44435
25/32	.7812	1/2	1 5/8	3 5/8	4	43551	—	—	—
13/16	.8125	5/8	1 7/8	4	4	—	44161	—	—
13/16	.8125	5/8	1 7/8	4	6	43517	—	—	—
13/16	.8125	3/4	1 7/8	4 1/8	4	43518	44157	96129	—
27/32	.8438	7/8	1 7/8	4 1/8	4	43552	—	—	—
7/8	.8750	5/8	1 7/8	4	6	43519	—	—	—
7/8	.8750	3/4	1 7/8	4 1/8	4	43520	43036	96130	—
7/8	.8750	7/8	1 7/8	4 1/8	4	43521	44144	—	44423
29/32	.9062	7/8	1 7/8	4 1/8	4	43553	—	—	—
15/16	.9375	3/4	1 7/8	4 1/8	4	43523	—	—	—
15/16	.9375	7/8	1 7/8	4 1/8	4	43524	44158	—	—
31/32	.9688	1	2	4 1/2	4	43554	—	—	—
1	1.0000	5/8	1 7/8	4	6	43525	—	—	—
1	1.0000	3/4	1 7/8	4 1/8	4	43526	43038	96134	—
1	1.0000	7/8	1 7/8	4 1/8	4	43527	—	—	—
1	1.0000	1	2	4 1/2	4	43528	44145	96132	44436
1	1.0000	1	2	4 1/2	6	—	—	—	44437
1 1/8	1.1250	3/4	1 1/2	3 7/8	6	43555	—	—	—
1 1/8	1.1250	1	2	4 1/2	4	—	44146	96135	—
1 1/8	1.1250	1	2	4 1/2	6	43530	—	—	—
1 1/4	1.2500	3/4	2	4 1/4	6	43556	—	—	—
1 1/4	1.2500	7/8	2	4 1/4	6	43531	—	—	—
1 1/4	1.2500	1	2	4 1/2	6	43532	43041	96136	—
1 1/4	1.2500	1 1/4	2	4 1/2	4	—	44147	—	44438
1 1/4	1.2500	1 1/4	2	4 1/2	6	43533	—	—	44439
1 3/8	1.3750	3/4	1 1/2	3 7/8	6	43557	—	—	—
1 3/8	1.3750	1	2	4 1/2	6	43534	—	—	—
1 1/2	1.5000	3/4	1 1/2	3 7/8	6	43558	—	—	—
1 1/2	1.5000	1	2	4 1/2	6	43535	—	—	—
1 1/2	1.5000	1 1/4	2	4 1/2	4	—	—	—	44440
1 1/2	1.5000	1 1/4	2	4 1/2	6	43536	44148	96138	44441
1 5/8	1.6250	1 1/4	2	4 1/2	6	43537	—	—	—
1 3/4	1.7500	3/4	1 1/2	3 7/8	6	43559	—	—	—
1 3/4	1.7500	1 1/4	2	4 1/2	6	43538	44159	—	44424
2	2.0000	3/4	2	4 1/16	8	43560	—	—	—
2	2.0000	1 1/4	2	4 1/2	6	—	44160	—	—
2	2.0000	1 1/4	2	4 1/2	8	43540	—	—	—

End Mills

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Multi-Flute Long Length Single End Mills

**High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated**

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

**Center Cutting** end allows for plunge cutting like a drill into solid material.

**Long Length** end mills provide a longer length of cut for deeper milling applications.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

Fraise à queue à rainurer longue

cortador vertical largo



- List No. 1900 High Speed Steel**  
**List No. 4551 High Speed Steel Center Cutting**  
**List No. 4551G High Speed Steel Center Cutting  
TiN Coated**  
**List No. 4587 M42 8% Cobalt Center Cutting**

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

**STANDARD PACKAGE** All sizes — 1 each

**Tool Coatings  
Also Available**

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	1900	4551	4551G	4587
						High Speed Steel NON-CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING TIN COATED EDP NO.	COBALT CENTER CUTTING EDP NO.
3/16	.1875	3/8	1 1/4	3 1/16	4	—	44169	96230	—
7/32	.2188	3/8	1 1/4	3 1/16	4	—	44170	96231	—
1/4	.2500	3/8	1 1/4	3 1/16	4	43776	44171	96232	44534
9/32	.2812	3/8	1 3/8	3 3/8	4	—	44180	96233	44535
5/16	.3125	3/8	1 3/8	3 3/8	4	43777	44172	96234	44536
11/32	.3438	3/8	1 1/2	3 3/4	4	—	44181	96235	44537
3/8	.3750	3/8	1 1/2	3 3/4	4	—	44173	96236	44541
13/32	.4062	1/2	1 3/4	3 3/4	4	—	44182	96237	—
7/16	.4375	1/2	1 3/4	3 3/4	4	43779	44183	96238	—
15/32	.4688	1/2	2	4	4	—	44184	96239	—
1/2	.5000	1/2	2	4	4	—	44174	96240	44542
5/8	.6250	5/8	2 1/2	4 5/8	4	43781	44175	96241	44543
3/4	.7500	3/4	3	5 1/4	4	43782	44176	96242	44544
3/4	.7500	3/4	3	5 1/4	6	—	—	—	44545
7/8	.8750	7/8	3 1/2	5 3/4	4	43783	44177	96244	44540
1	1.0000	1	4	6 1/2	4	43784	44178	96245	44546
1	1.0000	1	4	6 1/2	6	—	—	—	44547
1 1/8	1.1250	1	4	6 1/2	4	—	44185	—	—
1 1/8	1.1250	1	4	6 1/2	6	43785	—	—	—
1 1/4	1.2500	1	4	6 1/2	4	—	44186	—	—
1 1/4	1.2500	1	4	6 1/2	6	43786	—	—	—
1 1/4	1.2500	1 1/4	4	6 1/2	4	—	44179	—	44548
1 1/4	1.2500	1 1/4	4	6 1/2	6	43787	—	—	44549
1 3/8	1.3750	1	4	6 1/2	6	43788	—	—	—
1 1/2	1.5000	1	4	6 1/2	4	—	44187	—	—
1 1/2	1.5000	1	4	6 1/2	6	43789	—	—	—
1 1/2	1.5000	1 1/4	4	6 1/2	4	—	44188	—	—
1 1/2	1.5000	1 1/4	4	6 1/2	6	43790	—	—	—
1 3/4	1.7500	1 1/4	4	6 1/2	6	43791	—	—	—
2	2.0000	1 1/4	4	6 1/2	4	—	44190	—	—
2	2.0000	1 1/4	4	6 1/2	8	43792	—	—	—

# Multi-Flute Extra Long Length Single End Mills

Fraise à queue à rainurer extra-longue

cortador vertical extra largo



**High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated**

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

**Center Cutting** end allows for plunge cutting like a drill into solid material.

**Long Length** end mills provide a longer length of cut for deeper milling applications.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

- List No. 1901 High Speed Steel
- List No. 4552 High Speed Steel Center Cutting
- List No. 4552G High Speed Steel Center Cutting  
TiN Coated
- List No. 4588 M42 8% Cobalt Center Cutting

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	1901	4552	4552G	4588
						High Speed Steel NON-CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING EDP NO.	High Speed Steel CENTER CUTTING TIN COATED EDP NO.	COBALT CENTER CUTTING EDP NO.
3/16	.1875	3/8	1 3/4	3 9/16	4	—	44199	—	—
1/4	.2500	3/8	1 3/4	3 9/16	4	43826	44201	96252	45390
5/32	.2812	3/8	1 3/4	3 3/4	4	—	44210	96253	45391
5/16	.3125	3/8	2	3 3/4	4	43827	44202	96254	45392
1 1/32	.3438	3/8	2 1/2	4 1/4	4	—	44211	96255	45393
3/8	.3750	3/8	2 1/2	4 1/4	4	43828	44203	96256	44520
7/16	.4375	1/2	2 3/4	4 3/4	4	—	44213	96258	45395
1 5/32	.4688	1/2	3	5	4	—	44214	96259	—
1/2	.5000	1/2	3	5	4	43829	44204	96260	44521
5/8	.6250	5/8	4	6 1/8	4	43830	44205	96261	44522
3/4	.7500	3/4	4	6 1/4	4	43831	44206	96262	44523
3/4	.7500	3/4	4	6 1/4	6	—	—	—	44524
7/8	.8750	7/8	5	7 1/4	4	43832	44207	96264	—
1	1.0000	1	6	8 1/2	4	43833	44208	96265	44525
1 1/4	1.2500	1 1/4	6	8 1/2	4	—	44209	—	44527
1 1/2	1.5000	1 1/4	8	10 1/2	6	43835	—	—	—

# Metric 4-Flute Single End Mills

Fraise à queue à rainurer simple

cortador vertical sencilloe



**High Speed Steel  
Center Cutting**

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

List No. 1897M

**STANDARD PACKAGE** All sizes — 1 each

DIA. MM	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.	DIA. MM	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
3.0	.1181	3/8	3/8	2 5/16	43392	14.0	.5512	1/2	1 3/8	3 3/8	43379
4.0	.1575	3/8	7/16	2 5/16	43393	15.0	.5906	1/2	1 3/8	3 3/8	43381
5.0	.1968	3/8	9/16	2 1/2	43361	16.0	.6299	5/8	1 3/8	3 3/4	43382
6.0	.2362	3/8	5/8	2 1/2	43363	17.0	.6693	5/8	1 3/8	3 3/4	43383
7.0	.2756	3/8	5/8	2 1/2	43365	18.0	.7087	5/8	1 3/8	3 3/4	43384
8.0	.3150	3/8	3/4	2 1/2	43367	19.0	.7480	3/4	1 3/8	3 7/8	43385
9.0	.3543	3/8	3/4	2 1/2	43369	20.0	.7874	3/4	1 7/8	4 1/8	43386
10.0	.3937	3/8	1	2 1 1/16	43371	22.0	.8661	3/4	1 7/8	4 1/8	43388
11.0	.4331	3/8	1	2 1 1/16	43373	23.0	.9055	7/8	1 7/8	4 1/8	43389
12.0	.4724	3/8	1	2 1 1/16	43375	24.0	.9449	1	2	4 1/2	43390
13.0	.5118	1/2	1 3/8	3 3/8	43377	25.0	.9843	1	2	4 1/2	43391

# 4-Flute

Fraise à queue à rainurer double

cortador vertical doble

## Double End Mills

High Speed Steel & M42 8% Cobalt

Bright Finish & TiN Coated

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

**Center Cutting** end allows for plunge cutting like a drill into solid material.

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and longer life in production applications.



- List No. 1895 High Speed Steel
- List No. 4553 High Speed Steel Center Cutting
- List No. 4553G High Speed Steel Center Cutting  
TiN Coated
- List No. 4582 M42 8% Cobalt Center Cutting

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

**STANDARD PACKAGE** All sizes — 1 each

Tool Coatings  
Also Available

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1895	4553	4553G	4582
					High Speed Steel NON-CENTER CUTTING	High Speed Steel CENTER CUTTING	High Speed Steel CENTER CUTTING TIN COATED	COBALT CENTER CUTTING
					EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	.1250	3/8	3/8	3 1/16	43266	44251	96000	44580
9/64	.1406	3/8	7/16	3 3/8	43286	43050	—	—
5/32	.1562	3/8	7/16	3 3/8	43267	43051	96002	44581
11/64	.1719	3/8	1/2	3 3/8	43287	43052	—	—
3/16	.1875	3/8	1/2	3 1/4	43268	44252	96004	44582
13/64	.2031	3/8	9/16	3 1/4	43288	43053	—	—
7/32	.2188	3/8	9/16	3 1/4	43269	43054	96006	44583
15/64	.2344	3/8	5/8	3 3/8	43289	—	—	—
1/4	.2500	3/8	5/8	3 3/8	43270	44253	96008	44584
17/64	.2656	3/8	1 1/16	3 3/8	43290	43056	—	—
9/32	.2812	3/8	1 1/16	3 3/8	43271	43057	96010	44585
19/64	.2969	3/8	3/4	3 1/2	43291	43058	—	—
5/16	.3125	3/8	3/4	3 1/2	43272	44254	96012	44586
21/64	.3281	3/8	3/4	3 1/2	43292	43059	—	—
11/32	.3438	3/8	3/4	3 1/2	43273	43060	96014	44587
23/64	.3594	3/8	3/4	3 1/2	43293	43061	—	—
3/8	.3750	3/8	3/4	3 1/2	43274	44255	96016	44588
25/64	.3906	1/2	1	4 1/8	43294	43062	—	—
13/32	.4062	1/2	1	4 1/8	43275	43063	96018	44589
27/64	.4219	1/2	1	4 1/8	43295	43064	—	—
7/16	.4375	1/2	1	4 1/8	43276	43065	96020	44590
29/64	.4531	1/2	1	4 1/8	43296	43066	—	—
15/32	.4687	1/2	1	4 1/8	43277	43067	96022	—
31/64	.4844	1/2	1	4 1/8	43297	43068	—	—
1/2	.5000	1/2	1	4 1/8	43278	44256	96024	44591
9/16	.5625	5/8	1 3/8	5	43279	43069	—	44592
5/8	.6250	5/8	1 3/8	5	43280	44257	96026	44593
11/16	.6875	3/4	1 5/8	5 5/8	43281	43070	—	—
3/4	.7500	3/4	1 5/8	5 5/8	43282	44258	96028	44594
13/16	.8125	7/8	1 7/8	6 1/8	43283	—	—	—
27/32	.8438	7/8	1 7/8	6 1/8	43303*	—	—	—
7/8	.8750	7/8	1 7/8	6 1/8	43284	44259	—	44595
29/32	.9062	1	1 7/8	6 3/8	43304*	—	—	—
15/16	.9375	1	1 7/8	6 3/8	43305	43072*	—	44599*
31/32	.9688	1	1 7/8	6 3/8	43306*	—	—	—
1	1.0000	1	1 7/8	6 3/8	43285	44260	96032	44596

\* Available While Supplies Last

End Mills

# 4-Flute Miniature Stub Length Double End Mills

**3/16" Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt**

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

Fraise à queue à rainurer double

cortador vertical doble



List No. 4569 High Speed Steel

List No. 4569C M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	High Speed Steel	
				4569 EDP NO.	4569C COBALT EDP NO.
1/16	.0625	3/32	2	44120	44126
3/32	.0938	9/64	2	44121	44128
1/8	.1250	3/16	2	44122	44130
5/32	.1562	15/64	2	44123	44132
3/16	.1875	9/32	2	44124	44134

# 4-Flute Miniature Regular Length Double End Mills

**3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt**

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

Fraise à queue à rainurer double

cortador vertical doble



List No. 1895 High Speed Steel

List No. 1895C M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	High Speed Steel	
				1895 EDP NO.	1895C COBALT EDP NO.
1/16	.0625	3/16	2 1/4	43261	43220
3/32	.0938	9/32	2 1/4	43262	43222
1/8	.1250	3/8	2 1/4	43263	43224
5/32	.1562	7/16	2 1/4	43264	43226
3/16	.1875	1/2	2 1/4	43265	43228

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

## 4-Flute Miniature Long Length Double End Mills

3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** end mills are designed for small diameter milling of slots, keyways and pockets. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	1893	1893C
				High Speed Steel EDP NO.	COBALT EDP NO.
1/16	.0625	7/32	2 1/2	43241	44320
3/32	.0938	9/32	2 5/8	43242	44321
1/8	.1250	3/4	3 1/8	43243	44322
5/32	.1562	7/8	3 1/4	43244	44323
3/16	.1875	1	3 3/8	43245	44324

Tool Coatings Also Available

Fraise à queue à rainurer double

cortador vertical doble



List No. 1893 High Speed Steel

List No. 1893C M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

## 4-Flute Stub Length Double End Mills

High Speed Steel

**Multi-Flute** end mills offer higher feed rates, improved surface finish and greater core strength for reduced tool deflection.

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	EDP NO.
1/8	.1250	3/8	3/16	2 3/4	44193
5/32	.1562	3/8	15/64	2 3/4	44194
3/16	.1875	3/8	9/32	2 3/4	44195
7/32	.2188	3/8	2 1/64	2 3/4	44196
1/4	.2500	3/8	3/8	2 3/4	44197

Fraise à queue à rainurer double

cortador vertical doble



List No. 4561 High Speed Steel

**STANDARD PACKAGE** All sizes — 1 each

**Stub Length** provides increased rigidity in shallow milling applications.

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**



# 2-Flute Ball Nose Single End Mills

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting

**Ball Nose** end mills are designed for milling die cavities, fillets, round bottomed holes and radius bottom slots. **2-Flute** end mills provide increased chip capacity. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 1887 High Speed Steel  
List No. 1887G High Speed Steel TiN Coated  
List No. 4583 M42 8% Cobalt

STANDARD All sizes — 1 each  
PACKAGE

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1887	1887G	4583
					High Speed Steel	High Speed Steel	COBALT
					EDP NO.	TIN COATED EDP NO.	EDP NO.
1/8	.1250	3/8	3/8	2 5/16	43111	96460	44401
3/16	.1875	3/8	1/2	2 3/8	43112	96461	44402
1/4	.2500	3/8	5/8	2 7/16	43113	96462	44403
5/16	.3125	3/8	3/4	2 1/2	43114	96463	44404
3/8	.3750	3/8	3/4	2 1/2	43115	96464	44405
7/16	.4375	1/2	1	3	43116	96465	—
1/2	.5000	1/2	1	3	43117	96466	44406
9/16	.5625	1/2	1 1/8	3 1/8	43118	—	—
5/8	.6250	5/8	1 3/8	3 1/2	43120	96467	44407
3/4	.7500	3/4	1 5/8	3 7/8	43122	96468	44408
7/8	.8750	7/8	2	4 1/4	43123	96469	44412
1	1.0000	1	2 1/4	4 3/4	43124	96470	44409
1 1/8	1.1250	1	2 1/4	4 3/4	43125	—	—
1 1/4	1.2500	1 1/4	2 1/2	5	43126	—	44410
1 1/2	1.5000	1 1/4	2 1/2	5	43127	—	44411

# 2-Flute Ball Nose Extended Length Single End Mills

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting

**Extended Length** for applications that require longer reach but not a longer length of cut. The increased rigidity of the unfluted shank reduces deflection.

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 1888 High Speed Steel  
List No. 1888G High Speed Steel TiN Coated  
List No. 4590 M42 8% Cobalt

STANDARD All sizes — 1 each  
PACKAGE

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	LENGTH BELOW SHANK	OAL	1888	1888G	4590
						High Speed Steel	High Speed Steel	COBALT
						EDP NO.	TIN COATED EDP NO.	EDP NO.
1/8	.1250	3/8	3/8	1 3/16	2 9/16	43136	96480	45405
3/16	.1875	3/8	1/2	1 1/8	2 1 1/16	43137	96481	45406
1/4	.2500	3/8	5/8	1 1/2	3 1/16	43138	96482	45407
5/16	.3125	3/8	3/4	1 3/4	3 5/16	43139	96483	45408
3/8	.3750	3/8	3/4	1 3/4	3 5/16	43140	96484	45409
7/16	.4375	1/2	1	1 7/8	3 3/4	43141*	—	—
1/2	.5000	1/2	1	2 1/4	4	43142	96486	45410
5/8	.6250	5/8	1 3/8	2 3/4	4 5/8	43143	—	—
3/4	.7500	3/4	1 5/8	3 3/8	5 3/8	43144	96487	45411
1	1.0000	1	2 1/2	5	7 1/4	43146	96488	45412
1 1/4	1.2500	1 1/4	3	5	7 1/4	43147	—	—

\* Available While Supplies Last

# 2-Flute Ball Nose Double End Mills

High Speed Steel  
Bright Finish & TiN Coated  
Center Cutting

**Ball Nose** end mills are designed for milling die cavities, fillets, round bottom holes and radius bottom slots. **2-Flute** end mills provide increased chip capacity. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 1889 High Speed Steel  
List No. 1889G High Speed Steel TiN Coated

**Titanium Nitride (TiN) Coating** is an excellent coating for machining a wide variety of materials at greatly increased speeds and feeds. TiN coating increases tool surface hardness, lubricity, and heat resistance and resists chip welding.

**STANDARD PACKAGE** All sizes — 1 each

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	1889	1889G
					High Speed Steel EDP NO.	High Speed Steel TIN COATED EDP NO.
1/8	.1250	3/8	3/8	3 1/16	43161	96495
3/16	.1875	3/8	7/16	3 1/8	43162	96496
7/32	.2188	3/8	1/2	3 1/8	43173	—
1/4	.2500	3/8	1/2	3 1/8	43163	96497
9/32	.2812	3/8	9/16	3 1/8	43174	—
5/16	.3125	3/8	9/16	3 1/8	43164	96498
11/32	.3438	3/8	9/16	3 1/8	43175	—
3/8	.3750	3/8	9/16	3 1/8	43165	96499
7/16	.4375	1/2	13/16	3 3/4	43166	—
1/2	.5000	1/2	13/16	3 3/4	43167	96500
5/8	.6250	5/8	1 1/8	5	43168	—
3/4	.7500	3/4	1 5/16	5	43169	—
7/8	.8750	7/8	1 9/16	6 1/8	43170*	—
1	1.0000	1	1 5/8	6 3/8	43171*	—

Tool Coatings  
Also Available

\* Available While Supplies Last

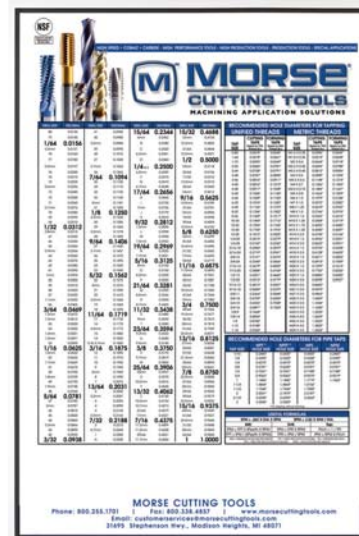
## Morse® Plastic Wall Chart

Tableau mural

Tabla mural

NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650



# 2-Flute Miniature Ball Nose Stub Length Double End Mills

3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** ball nose end mills are designed for small diameter milling of die cavities, fillets, round bottom holes and radius bottom slots. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	4570 High Speed Steel EDP NO.	4570C COBALT EDP NO.
1/16	.0625	3/32	2	44340	43210
3/32	.0938	9/64	2	44341	43212
1/8	.1250	3/16	2	44342	43214
5/32	.1562	15/64	2	44343	43216
3/16	.1875	9/32	2	44344	43218

Tool Coatings  
Also Available

# 2-Flute Miniature Ball Nose Regular Length Double End Mills

3/16" Dia. Shank — Center Cutting  
High Speed Steel & M42 8% Cobalt

**Miniature 3/16" Shank** ball nose end mills are designed for small diameter milling of die cavities, fillets, round bottom holes and radius bottom slots. **Center Cutting** end allows for plunge cutting like a drill into solid material. For maximum rigidity, select the shortest possible length of cut for your application.

DIA.	DEC. EQUIV.	LENGTH OF CUT	OAL	1890 High Speed Steel EDP NO.	1890C COBALT EDP NO.
1/32	.0312	3/32	2 1/4	43186	—
1/16	.0625	3/16	2 1/4	43188	43200
3/32	.0938	9/32	2 1/4	43190	43202
1/8	.1250	3/8	2 1/4	43192	43204
5/32	.1562	7/16	2 1/4	43194	43206
3/16	.1875	1/2	2 1/4	43196	43208

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 4570 High Speed Steel  
List No. 4570C M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 1890 High Speed Steel  
List No. 1890C M42 8% Cobalt

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

**CUTTING FLUIDS** provide many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Multi-Flute Ball Nose Single End Mills

High Speed Steel & M42 8% Cobalt  
Bright Finish & TiN Coated  
Center Cutting

**Ball Nose** end mills are designed for milling die cavities, fillets, round bottom holes and radius bottom slots.

**Multi-Flute** end mills offer improved surface finish and feature greater core strength for reduced tool deflection.

**Center Cutting** end allows for plunge cutting like a drill into solid material.

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STANDARD PACKAGE		
						4554 High Speed Steel EDP NO.	4554G High Speed Steel TIN COATED EDP NO.	4589 COBALT EDP NO.
1/8	.1250	3/8	3/8	25/16	4	—	—	44451
3/16	.1875	3/8	1/2	23/8	4	—	—	44452
1/4	.2500	3/8	3/4	29/16	4	44274	96512	44453
5/16	.3125	3/8	1	23/4	4	44275	96513	44454
3/8	.3750	3/8	1	23/4	4	44276	96514	44455
1/2	.5000	1/2	1 1/4	3 1/4	4	44277	96515	44456
5/8	.6250	5/8	1 5/8	3 3/4	4	44278	96516	44457
3/4	.7500	3/4	1 5/8	3 7/8	4	44279	96517	44458
7/8	.8750	7/8	1 7/8	4 1/8	4	44280	96518	—
1	1.0000	1	2	4 1/2	4	44281	96519	44460
1	1.0000	1	2	4 1/2	6	—	—	44461

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 4554 High Speed Steel  
List No. 4554G High Speed Steel TiN Coated  
List No. 4589 M42 8% Cobalt

STANDARD PACKAGE All sizes — 1 each

# Multi-Flute Long Length Ball Nose Single End Mills

High Speed Steel  
Bright Finish & TiN Coated  
Center Cutting

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STANDARD PACKAGE	
						4555 High Speed Steel EDP NO.	4555G High Speed Steel TIN COATED EDP NO.
1/4	.2500	3/8	1 1/4	3 1/16	4	44298	96525
5/16	.3125	3/8	1 3/8	3 1/8	4	44299	96526
3/8	.3750	3/8	1 1/2	3 1/4	4	44300	96527
1/2	.5000	1/2	2	4	4	44301	96528
5/8	.6250	5/8	2 1/2	4 5/8	4	44302	96529
3/4	.7500	3/4	3	5 1/4	4	44303	96530
1	1.0000	1	4	6 1/2	4	44304	—
1 1/4	1.2500	1 1/4	4	6 1/2	4	44305	—
1 1/2	1.5000	1 1/4	4	6 1/2	4	44306	—

Fraise cylindrique deux tailles à bout hémisphérique  
cortador vertical con punta esférica



List No. 4555 High Speed Steel  
List No. 4555G High Speed Steel TiN Coated

STANDARD PACKAGE All sizes — 1 each

## TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Multi-Flute Coarse Pitch Roughing End Mills

High Speed Steel

Roughing end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. Economical **High Speed Steel** roughing end mills are recommended for most materials of low to medium hardness.

Fraise à queue à rainurer de dégrossissage  
cortador vertical para desbaste



List No. 4593

STANDARD  
PACKAGE

All sizes — 1 each

## Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/4	.2500	3/8	5/8	27/16	3	44464
5/16	.3125	3/8	3/4	2 1/2	3	44465
3/8	.3750	3/8	3/4	2 1/2	4	44466
1/2	.5000	1/2	1 1/4	3 1/4	4	44476
5/8	.6250	5/8	1 5/8	3 3/4	4	44477
3/4	.7500	3/4	1 5/8	3 3/8	4	44478
1	1.0000	3/4	1 7/8	4 1/8	5	44463
1	1.0000	1	2	4 1/2	5	44480
1	1.0000	1	3	5 1/2	5	44468
1 1/4	1.2500	3/4	2	4 1/2	6	44469
1 1/4	1.2500	1 1/4	2	4 1/2	6	44482
1 1/2	1.5000	3/4	2 1/4	4 1/2	6	44470
1 1/2	1.5000	1 1/4	2	4 1/2	6	44483
2	2.0000	1 1/4	2	4 1/2	8	44471

## Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/2	.5000	1/2	2	4	4	44467
3/4	.7500	3/4	3	5 1/4	4	44488
1	1.0000	1	4	6 1/2	5	44490
1 1/4	1.2500	1 1/4	4	6 1/2	6	44491
1 1/2	1.5000	1 1/4	4	6 1/2	6	44492
2	2.0000	2	6	9 3/4	8	44494*

\* Available While Supplies Last

Tool Coatings Also Available



Center Cutting

## 2-Flute 6-Pc. Sets

Sizes 1/8", 3/16", 1/4", 5/16", 3/8", 1/2"

(Sizes 1/8" - 3/8" are 3/8" shank, size 1/2" is 1/2" shank)

SET NO.	LIST NO.	DESCRIPTION	EDP NO.
W-11	1887	2 Flute, Single End, Ball Nose	45001
W-13	1896	2 Flute, Double End	45015
W-15	1898	2 Flute, Single End	45025

## End Mill Sets Single End and Double End High Speed Steel In Wooden Stand

Jeu de fraises à queue à rainurer

Juego de cortadores verticales



Non-Center Cutting

## 4-Flute 6-Pc. Sets

Sizes 1/8", 3/16", 1/4", 5/16", 3/8", 1/2"

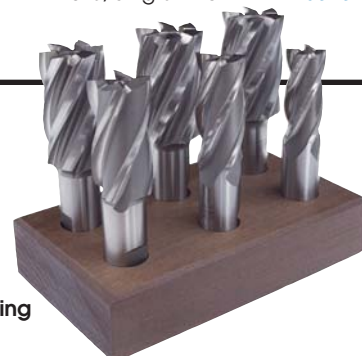
(Sizes 1/8" - 3/8" are 3/8" shank, size 1/2" is 1/2" shank)

SET NO.	LIST NO.	DESCRIPTION	EDP NO.
W-12	1895	4 Flute, Double End	45010
W-14	1897	4 Flute, Single End	45020

## 3/4" Shank 6-Pc. Multi-Flute Set

Sizes 3/4", 7/8", 1", 1-1/8", 1-1/4", 1-1/2"

SET NO.	LIST NO.	DESCRIPTION	EDP NO.
W-21	1897	Multi-Flute, Single End	45021



Non-Center Cutting

End Mills

# M42 8% Cobalt Roughing / Finishing End Mills

## Center Cutting

**Roughing / Finishing** end mills rough and finish in a single pass, removing material at roughing rates while producing a finish near that produced by standard end mills. Recommended for a wide variety of materials of soft to medium hardness including titanium and aluminum alloys.

Fraise à queue à rainurer de dégrossissage et de finition  
cortador vertical para desbastado/acabado



List No. 4640 — Bright Finish

List No. 4640G — TiN Coated

List No. 4640C — TiCN Coated

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications. **Tool Coatings** further enhance milling performance.

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	UNCOATED	TIN COATED	TICN COATED
						EDP NO.	EDP NO.	EDP NO.
3/16	.1875	3/8	1/2	2 3/8	4	45100	45200	45300
1/4	.2500	3/8	5/8	2 7/16	4	45101	45201	45301
5/16	.3125	3/8	3/4	2 1/2	4	45102	45202	45302
5/16	.3125	3/8	1 3/8	3 1/8	4	45103	45203	45303
3/8	.3750	3/8	3/4	2 1/2	4	45104	45204	45304
7/16	.4375	3/8	1	2 11/16	4	45105	45205	45305
1/2	.5000	1/2	1 1/4	3 1/4	4	45106	45206	45306
1/2	.5000	1/2	2	4	4	45107	45207	45307
1/2	.5000	1/2	3	5	4	45108	45208	45308
9/16	.5625	1/2	1 3/8	3 3/8	4	45112	45212	45312
5/8	.6250	5/8	1 5/8	3 3/4	4	45113	45213	45313
5/8	.6250	5/8	2 1/2	4 5/8	4	45114	45214	45314
1 1/16	.6875	5/8	1 5/8	3 3/4	4	45119	45219	45319
3/4	.7500	5/8	1 5/8	3 3/4	4	45120	45220	45320
3/4	.7500	3/4	1 5/8	3 7/8	4	45121	45221	45321
3/4	.7500	3/4	3	5 1/4	4	45122	45222	45322
3/4	.7500	3/4	4 1/8	6 3/8	4	45123	45223	45323
1 3/16	.8125	3/4	1 7/8	4 1/8	5	45127	45227	45327
7/8	.8750	3/4	1 7/8	4 1/8	5	45128	45228	45328
1	1.0000	3/4	2	4 1/4	5	45132	45232	45332
1	1.0000	1	2	4 1/2	5	45137	45237	45337
1	1.0000	1	4	6 1/2	5	45138	45238	45338
1	1.0000	1	6	8 1/2	5	45139	45239	45339
1	1.0000	1	1 5/8	4 1/8	5	—	45241*	45341*
1	1.0000	1	3	5 1/2	5	45142	45242	45342
1 1/8	1.1250	3/4	2	4 1/4	6	45143	45243	45343
1 1/4	1.2500	3/4	2	4 1/4	6	45145	45245	45345
1 1/4	1.2500	1 1/4	2	4 1/2	6	45147	45247	45347
1 1/4	1.2500	1 1/4	4	6 1/2	6	45148	45248	45348
1 1/4	1.2500	1 1/4	6	8 1/2	6	45149	45249	45349
1 1/2	1.5000	3/4	2	4 1/2	6	45153	45253	45353
1 1/2	1.5000	3/4	1 1/8	3 3/8	6	45154*	45254*	45354*
1 1/2	1.5000	1 1/4	2	4 1/2	6	45156	45256	45356
1 1/2	1.5000	1 1/4	4	6 1/2	6	45157	45257	45357
1 1/2	1.5000	1 1/4	6	8 1/2	6	45158	45258	45358

\* Available while supplies last

### TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiAlN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# M42 8% Cobalt Coarse Pitch Roughing End Mills

**Roughing** end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. **Coarse Pitch** is recommended for a wide variety of materials of soft to medium hardness including titanium and aluminum alloys.

## Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/4	.2500	3/8	5/8	27/16	3	44496
5/16	.3125	3/8	3/4	2 1/2	3	44497
3/8	.3750	3/8	3/4	2 1/2	4	44498
1/2	.5000	1/2	1 1/4	3 1/4	4	44501
5/8	.6250	5/8	1 5/8	3 3/4	4	44502
3/4	.7500	5/8	1 5/8	3 7/8	4	44635
3/4	.7500	3/4	1 5/8	3 7/8	4	44503
7/8	.8750	3/4	1 7/8	4 1/8	5	44636
1	1.0000	3/4	2	4 1/4	5	44500
1	1.0000	1	2	4 1/2	5	44505
1 1/8	1.1250	1	2	4 1/2	6	44638
1 1/4	1.2500	1 1/4	2	4 1/2	6	44508
1 1/4	1.2500	3/4	2	4 1/2	6	44639
1 1/2	1.5000	1 1/4	2	4 1/2	6	44511

# M42 8% Cobalt Fine Pitch Roughing End Mills

**Roughing** end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. **Fine Pitch** is recommended for difficult-to-machine, high tensile strength, abrasive and harder materials up to 40 Rc.

## Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/4	.2500	3/8	5/8	27/16	4	44650
5/16	.3125	3/8	3/4	2 1/2	4	44651
3/8	.3750	3/8	3/4	2 1/2	4	44652
7/16	.4375	3/8	1	2 11/16	4	44653
1/2	.5000	1/2	1 1/4	3 1/4	4	44654
9/16	.5625	1/2	1 3/8	3 3/8	4	44655
5/8	.6250	5/8	1 5/8	3 3/4	4	44656
3/4	.7500	3/4	1 5/8	3 7/8	4	44658
7/8	.8750	3/4	1 7/8	4 1/8	5	44659
7/8	.8750	7/8	1 7/8	4 1/8	5	44660
1	1.0000	3/4	2	4 1/4	5	44661
1	1.0000	1	2	4 1/2	5	44662
1 1/4	1.2500	3/4	2	4 1/2	6	44664
1 1/4	1.2500	1 1/4	2	4 1/2	6	44665
1 1/2	1.5000	1 1/4	2	4 1/2	6	44667
2	2.0000	1 1/4	2	4 1/2	8	44670

Fraise à queue à rainurer de dégrossissage  
cortador vertical para desbaste



## List No. 4594

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

## Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/2	.5000	1/2	2	4	4	44499
5/8	.6250	5/8	2 1/2	4 5/8	4	44643
3/4	.7500	3/4	3	5 1/4	4	44504
1	1.0000	1	4	6 1/2	5	44507
1 1/4	1.2500	1 1/4	4	6 1/2	6	44510
1 1/2	1.5000	1 1/4	4	6 1/2	6	44513
1 3/4	1.7500	1 1/4	4	6 1/2	6	44644
2	2.0000	1 1/4	4	6 1/2	6	44645
2	2.0000	2	4	7 3/4	8	44516
2	2.0000	2	6	9 3/4	8	44517

End Mills with 2" dia. shanks are provided with a dual drive shank.

Fraise à queue à rainurer de dégrossissage  
cortador vertical para desbaste



## List No. 4596

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications.

**STANDARD PACKAGE** All sizes — 1 each

## Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	EDP NO.
1/2	.5000	1/2	2	4	4	44671
5/8	.6250	5/8	2 1/2	4 5/8	4	44672
3/4	.7500	3/4	3	5 1/4	4	44673
1	1.0000	1	4	6 1/2	5	44675

Tool Coatings Also Available

# M42 8% Cobalt Coarse Pitch Center Cutting Roughing End Mills

## Center Cutting

**Roughing** end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. **Coarse Pitch** is recommended for a wide variety of materials of soft to medium hardness including titanium and aluminum alloys. **Center Cutting** end allows for plunge cutting like a drill into solid material.

### List No. 4611 - Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
						EDP NO.	EDP NO.	EDP NO.	EDP NO.
3/16	.1875	3/8	1/2	23/8	4	45413	—	—	45419
1/4	.2500	3/8	5/8	27/16	4	45414	—	—	45420
5/16	.3125	3/8	3/4	2 1/2	4	45415	—	—	45421
3/8	.3750	3/8	3/4	2 1/2	4	45416	—	—	45422
7/16	.4375	3/8	1	2 11/16	4	45417	—	—	45423
1/2	.5000	1/2	1 1/4	3 1/4	4	44910	44921	44932	45425
5/8	.6250	5/8	1 5/8	3 3/4	4	44911	44922	44933	45426
3/4	.7500	3/4	1 5/8	3 7/8	4	44912	44923	44934	45427
7/8	.8750	3/4	1 7/8	4 1/8	5	44913	44924	44935	45428
1	1.0000	1	2	4 1/2	5	44914	44925	44936	45429
1 1/4	1.2500	1 1/4	2	4 1/2	6	44915	44926	44937	45430
1 1/2	1.5000	1 1/4	2	4 1/2	6	44916	44927	44938	45431

### List No. 4612 - Medium & Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
						EDP NO.	EDP NO.	EDP NO.	EDP NO.
3/8	.3750	3/8	1 1/2	3 1/4	4	45418	—	—	45424
1/2	.5000	1/2	2	4	4	44943	44952	44961	45432
5/8	.6250	5/8	2 1/2	4 5/8	4	44944	44953	44962	45433
3/4	.7500	3/4	3	5 1/4	4	44945	44954	44963	45434
1	1.0000	1	3	5 1/2	5	44946	44955	44964	45435
1	1.0000	1	4	6 1/2	5	44947	44956	44965	45436
1 1/4	1.2500	1 1/4	3	5 1/2	6	44948	44957	44966	45437
1 1/4	1.2500	1 1/4	4	6 1/2	6	44949	44958	44967	45438
1 1/2	1.5000	1 1/4	3	5 1/2	6	44950	44959	44968	45439
1 1/2	1.5000	1 1/4	4	6 1/2	6	44951	44960	44969	45440

Fraise à queue à rainurer de dégrossissage

cortador vertical para desbaste



List No. 4611 — Regular Length

List No. 4612 — Medium &amp; Long Length

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications. **Tool Coatings** further enhance milling performance.

**STANDARD PACKAGE** All sizes — 1 each

## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon



# M42 8% Cobalt Fine Pitch Center Cutting Roughing End Mills

## Center Cutting

**Roughing** end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. **Fine Pitch** is recommended for difficult-to-machine, high tensile strength, abrasive and harder materials up to 40 Rc. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise à queue à rainurer de dégrossissage

cortador vertical para desbaste



List No. 4613 — Regular Length

List No. 4614 — Medium & Long Length

**M42 8% Cobalt** offers increased wear and heat resistance for abrasive and difficult materials, higher speeds and feeds and long life in production applications. **Tool Coatings** further enhance milling performance.

**STANDARD PACKAGE** All sizes — 1 each

## List No. 4613 - Regular Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
						EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/4	.2500	3/8	5/8	27/16	4	45441	—	—	45443
3/8	.3750	3/8	3/4	2 1/2	4	45442	—	—	45444
1/2	.5000	1/2	1 1/4	3 1/4	4	44970	44981	45050	45445
5/8	.6250	5/8	1 5/8	3 3/4	4	44971	44982	45051	45446
3/4	.7500	3/4	1 5/8	3 7/8	4	44972	44983	45052	45447
7/8	.8750	3/4	1 7/8	4 1/8	5	44973	44984	45053	45448
1	1.0000	1	2	4 1/2	5	44974	44985	45054	45449
1 1/4	1.2500	1 1/4	2	4 1/2	6	44975	44986	45055	45450
1 1/2	1.5000	1 1/4	2	4 1/2	6	44976	44987	45056	45451
2	2.0000	2	2	5 3/4	8	—	—	45057*	—
2	2.0000	2	3	6 3/4	8	—	44989*	—	—

End Mills with 2" dia. shanks are provided with a dual drive shank

\* Available while supplies last

## List No. 4614 - Medium & Long Length

DIA.	DEC. EQUIV.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
						EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/2	.5000	1/2	2	4	4	45061	45070	45079	45452
5/8	.6250	5/8	2 1/2	4 5/8	4	45062	45071	45080	45453
3/4	.7500	3/4	3	5 1/4	4	45063	45072	45081	45454
1	1.0000	1	3	5 1/2	5	45064	45073	45082	45455
1	1.0000	1	4	6 1/2	5	45065	45074	45083	45456
1 1/4	1.2500	1 1/4	3	5 1/2	6	45066	45075	45084	45457
1 1/4	1.2500	1 1/4	4	6 1/2	6	45067	45076	45085	45458
1 1/2	1.5000	1 1/4	3	5 1/2	6	45068	45077	45086	45459
1 1/2	1.5000	1 1/4	4	6 1/2	6	45069	45078	45087	45460

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Solid Carbide

## 2-Flute Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

2-Flute end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron. Ideal for plunge cutting and slotting. **Center Cutting** end allows for plunge cutting like a drill into solid material.

### TOLERANCES

Size to 1/4" +.000 - .002  
9/32" to 1" +.000 - .003  
Shank Dia. +.0000 - .0005

### List No. 5944 Regular Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TiCN COATED EDP NO.	TiAlN COATED EDP NO.
	DIA.	LOC	OAL				
1/64	1/8	3/64	1 1/2	58001	89999	—	89996
1/32	1/8	1/8	1 1/2	58002	90000	—	89997
3/64	1/8	1/8	1 1/2	58003	90001	—	89998
1/16	1/8	3/16	1 1/2	58004	90002	90039	90076
5/64	1/8	3/16	1 1/2	58005	90003	90040	90077
3/32	1/8	3/8	1 1/2	58006	90004	90041	90078
7/64	1/8	3/8	1 1/2	58007	90005	90042	90079
1/8	1/8	1/2	1 1/2	58008	90006	90043	90080
9/64	3/16	9/16	2	58009	90007	90044	90081
5/32	3/16	9/16	2	58010	90008	90045	90082
11/64	3/16	5/8	2	58011	90009	90046	90083
3/16	3/16	5/8	2	58012	90010	90047	90084
13/64	1/4	5/8	2 1/2	58013	90011	90048	90085
7/32	1/4	5/8	2 1/2	58014	90012	90049	90086
1/4	1/4	3/4	2 1/2	58016	90014	90051	90088
9/32	5/16	3/4	2 1/2	58018	90016	90053	90090
5/16	5/16	13/16	2 1/2	58020	90018	90055	90092
3/8	3/8	7/8	2 1/2	58024	90022	90059	90096
7/16	7/16	7/8	2 1/2	58028	90026	90063	90100
1/2	1/2	1	3	58032	90030	90067	90104
9/16	9/16	1 1/4	3 1/2	58036	90031	90068	90105
5/8	5/8	1 1/4	3 1/2	58040	90032	90069	90106
11/16	3/4	1 1/2	4	58044	90033	90070	90107
3/4	3/4	1 1/2	4	58048	90034	90071	90108
7/8	7/8	1 1/2	4	58056	90035	90072	90109
1	1	1 1/2	4	58064	90036	90073	90110

### List No. 5954 Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TiCN COATED EDP NO.	TiAlN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	3/4	2 1/4	58238	90120	90130	90140
3/16	3/16	3/4	2 1/2	58239	90121	90131	90141
1/4	1/4	1 1/8	3	58241	90122	90132	90142
5/16	5/16	1 1/8	3	58250	90123	90133	90143
3/8	3/8	1 1/8	3	58254	90124	90134	90144
7/16	7/16	2	4	58258	90125	90135	90145
1/2	1/2	2	4	58262	90126	90136	90146
5/8	5/8	2 1/4	5	58270	90127	90137	90147
3/4	3/4	2 1/4	5	58278	90128	90138	90148
1	1	2 1/4	5	58294	90129	90139	90149

### List No. 5950 Extra Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TiCN COATED EDP NO.	TiAlN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	1	3	58408	90160	90170	90180
3/16	3/16	1 1/8	3	58412	90161	90171	90181
1/4	1/4	1 1/2	4	58416	90162	90172	90182
5/16	5/16	1 5/8	4	58420	90163	90173	90183
3/8	3/8	1 3/4	4	58424	90164	90174	90184
7/16	7/16	3	6	58428	90165	90175	90185
1/2	1/2	3	6	58432	90166	90176	90186
5/8	5/8	3	6	58440	90167	90177	90187
3/4	3/4	3	6	58448	90168	90178	90188
1	1	3	6	58464	90169	90179	90189

Fraise à queue à rainurer au carbure

cortador vertical de carburo



List No. 5944 Regular Length



List No. 5954 Long Length

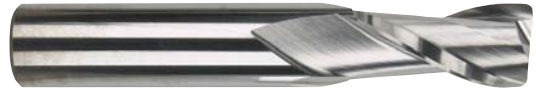


List No. 5950 Extra Long Length

# Solid Carbide Metric 2-Flute Single End Mills

Fraise à queue à rainurer au carbure

cortador vertical de carburo



Micrograin Carbide - Center Cutting  
30° Helix Angle

List No. 5959

2-Flute end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron. Ideal for plunge cutting and slotting. Center Cutting end mills allow for plunge cutting like a drill into solid material.

## TOLERANCES

All Sizes +.000mm/-.051mm  
Shank Dia. +0.000mm/-.013mm

## STANDARD PACKAGE

All sizes - 1 each

DIA.	SHANK			UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC	OAL	EDP NO.	EDP NO.	EDP NO.	EDP NO.
1 mm	3 mm	3 mm	39 mm	59280	90200	90220	90240
1.5 mm	3 mm	5 mm	39 mm	59281	90201	90221	90241
2 mm	3 mm	7 mm	39 mm	59282	90202	90222	90242
2.5 mm	3 mm	7 mm	39 mm	59283	90203	90223	90243
3 mm	3 mm	9 mm	39 mm	59284	90204	90224	90244
3.5 mm	4 mm	12 mm	51 mm	59285	90205	90225	90245
4 mm	4 mm	14 mm	51 mm	59286	90206	90226	90246
4.5 mm	5 mm	14 mm	51 mm	59287	90207	90227	90247
5 mm	5 mm	16 mm	51 mm	59288	90208	90228	90248
6 mm	6 mm	19 mm	64 mm	59289	90209	90229	90249
7 mm	8 mm	19 mm	64 mm	59290	90210	90230	90250
8 mm	8 mm	21 mm	64 mm	59291	90211	90231	90251
9 mm	10 mm	22 mm	70 mm	59292	90212	90232	90252
10 mm	10 mm	22 mm	70 mm	59293	90213	90233	90253
11 mm	11 mm	25 mm	70 mm	59294	90214	90234	90254
12 mm	12 mm	25 mm	76 mm	59295	90215	90235	90255
14 mm	14 mm	31 mm	89 mm	59297	90216	90236	90256
16 mm	16 mm	32 mm	89 mm	59298	90217	90237	90257
18 mm	18 mm	35 mm	102 mm	59299	90218	90238	90258
20 mm	20 mm	38 mm	102 mm	59300	90219	90239	90259

# Solid Carbide 2-Flute Double End Mills

Fraise à queue à rainurer au carbure

cortador vertical de carburo

Speeds & Feeds:  
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List No. 5947 Stub Length



List No. 5896 Regular Length

Micrograin Carbide - Center Cutting  
30° Helix Angle

List No. 5947 Stub Length

DIA.	SHANK			UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC	OAL	EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/16	1/8	1/8	1 1/2	57250	90300	90311	90322
3/32	1/8	3/16	1 1/2	57251	90301	90312	90323
1/8	1/8	1/4	1 1/2	57252	90302	90313	90324
5/32	3/16	5/16	2	57253	90303	90314	90325
3/16	3/16	3/8	2	57254	90304	90315	90326
7/32	1/4	1/2	2 1/2	57255	90305	90316	90327
1/4	1/4	1/2	2 1/2	57256	90306	90317	90328
5/16	5/16	1/2	2 1/2	57257	90307	90318	90329
3/8	3/8	9/16	3	57258	90308	90319	90330
7/16	7/16	9/16	3	57259	90309	90320	90331
1/2	1/2	5/8	3	57260	90310	90321	90332

List No. 5896 Regular Length

DIA.	SHANK			UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC	OAL	EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	3/8	3/8	3 1/8	57158	90350	90360	90370
5/32	3/8	7/16	3 1/8	57160	90351	90361	90371
3/16	3/8	1/2	3 1/4	57162	90352	90362	90372
7/32	3/8	9/16	3 3/8	57164	90353	90363	90373
1/4	3/8	5/8	3 3/8	57166	90354	90364	90374
9/32	3/8	11/16	3 3/8	57168	90355	90365	90375
5/16	3/8	3/4	3 1/2	57170	90356	90366	90376
3/8	3/8	3/4	3 1/2	57174	90357	90367	90377
7/16	1/2	7/8	4	57178	90358	90368	90378
1/2	1/2	1	4	57182	90359	90369	90379

# Solid Carbide 2-Flute Ball Nose Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

2-Flute end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique au carbure

cortador vertical con punta esférica de carburo



List No. 5940 Regular Length



List No. 5956 Long Length



List No. 5952 Extra Long Length

## List No. 5940 Regular Length

DIA.	SHANK		OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC		EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/64	1/8	3/64	1 1/2	58101	90397	—	90394
1/32	1/8	1/8	1 1/2	58102	90398	—	90395
3/64	1/8	1/8	1 1/2	58103	90399	—	90396
1/16	1/8	3/16	1 1/2	58104	90400	90423	90446
5/64	1/8	3/16	1 1/2	58105	90401	90424	90447
3/32	1/8	3/8	1 1/2	58106	90402	90425	90448
7/64	1/8	3/8	1 1/2	58107	90403	90426	90449
1/8	1/8	1/2	1 1/2	58108	90404	90427	90450
9/64	3/16	9/16	2	58109	90405	90428	90451
5/32	3/16	9/16	2	58110	90406	90429	90452
11/64	3/16	5/8	2	58111	90407	90430	90453
3/16	3/16	5/8	2	58112	90408	90431	90454
13/64	1/4	5/8	2 1/2	58113	90409	90432	90455
7/32	1/4	5/8	2 1/2	58114	90410	90433	90456
1/4	1/4	3/4	2 1/2	58116	90411	90434	90457
9/32	5/16	3/4	2 1/2	58118	90412	90435	90458
5/16	5/16	13/16	2 1/2	58120	90413	90436	90459
3/8	3/8	7/8	2 1/2	58124	90414	90437	90460
7/16	7/16	1	2 3/4	58128	90415	90438	90461
1/2	1/2	1	3	58132	90416	90439	90462
9/16	9/16	1 1/4	3 1/2	58136	90417	90440	90463
5/8	5/8	1 1/4	3 1/2	58140	90418	90441	90464
1 1/16	3/4	1 1/2	4	58144	90419	90442	90465
3/4	3/4	1 1/2	4	58148	90420	90443	90466
7/8	7/8	1 1/2	4	58156	90421	90444	90467
1	1	1 1/2	4	58164	90422	90445	90468

## List No. 5956 Long Length

DIA.	SHANK		OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC		EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	1/8	3/4	2 1/4	57575	90470	90480	90490
3/16	3/16	3/4	2 1/2	57577	90471	90481	90491
1/4	1/4	1 1/8	3	57581	90472	90482	90492
5/16	5/16	1 1/8	3	57583	90473	90483	90493
3/8	3/8	1 1/8	3	57585	90474	90484	90494
7/16	7/16	2	4	57587	90475	90485	90495
1/2	1/2	2	4	57589	90476	90486	90496
5/8	5/8	2 1/4	5	57591	90477	90487	90497
3/4	3/4	2 1/4	5	57593	90478	90488	90498
1	1	2 1/4	5	57595	90479	90489	90499

## List No. 5952 Extra Long Length

DIA.	SHANK		OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
	DIA.	LOC		EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	1/8	1	3	58608	90500	90510	90520
3/16	3/16	1 1/8	3	58612	90501	90511	90521
1/4	1/4	1 1/2	4	58616	90502	90512	90522
5/16	5/16	1 5/8	4	58620	90503	90513	90523
3/8	3/8	1 3/4	4	58624	90504	90514	90524
7/16	7/16	3	6	58628	90505	90515	90525
1/2	1/2	3	6	58632	90506	90516	90526
5/8	5/8	3	6	58640	90507	90517	90527
3/4	3/4	3	6	58648	90508	90518	90528
1	1	3	6	58664	90509	90519	90529

# Solid Carbide Metric 2-Flute Ball Nose Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**2-Flute** end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique au carbure  
cortador vertical con punta esférica de carburo



List No. 5963

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance and long tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

**TOLERANCES**

All Sizes +.000mm/-.051mm  
Shank Dia. +.000mm/-.013mm

**STANDARD PACKAGE**

All sizes - 1 each

DIA.	SHANK DIA.	LOC	OAL	UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
1 mm	3 mm	3 mm	39 mm	59400	90540	90560	90580
1.5 mm	3 mm	5 mm	39 mm	59401	90541	90561	90581
2 mm	3 mm	7 mm	39 mm	59402	90542	90562	90582
2.5 mm	3 mm	7 mm	39 mm	59403	90543	90563	90583
3 mm	3 mm	9 mm	39 mm	59404	90544	90564	90584
3.5 mm	4 mm	12 mm	51 mm	59405	90545	90565	90585
4 mm	4 mm	14 mm	51 mm	59406	90546	90566	90586
4.5 mm	5 mm	14 mm	51 mm	59407	90547	90567	90587
5 mm	5 mm	16 mm	51 mm	59408	90548	90568	90588
6 mm	6 mm	19 mm	64 mm	59409	90549	90569	90589
7 mm	8 mm	19 mm	64 mm	59410	90550	90570	90590
8 mm	8 mm	21 mm	64 mm	59411	90551	90571	90591
9 mm	10 mm	22 mm	70 mm	59412	90552	90572	90592
10 mm	10 mm	22 mm	70 mm	59413	90553	90573	90593
11 mm	11 mm	25 mm	70 mm	59414	90554	90574	90594
12 mm	12 mm	25 mm	76 mm	59415	90555	90575	90595
14 mm	14 mm	31 mm	89 mm	59417	90556	90576	90596
16 mm	16 mm	32 mm	89 mm	59418	90557	90577	90597
18 mm	18 mm	35 mm	102 mm	59419	90558	90578	90598
20 mm	20 mm	38 mm	102 mm	59420	90559	90579	90599
22 mm	22 mm	38 mm	102 mm	59421*	—	—	—
25 mm	25 mm	38 mm	102 mm	59422*	—	—	—

\* Available While Supplies Last

Speeds & Feeds:  
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# Solid Carbide 2-Flute Stub Length Ball Nose Double End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**TOLERANCES**

Size to 1/4" +.000 - .002  
9/32" to 1" +.000 - .003  
Shank Dia. +.0000 - .0005

**STANDARD PACKAGE**

All sizes - 1 each

Fraise cylindrique deux tailles à bout hémisphérique au carbure  
cortador vertical con punta esférica de carburo



List No. 5948

**2-Flute** end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

DIA.	SHANK DIA.	LOC	OAL	UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
1/16	1/8	1/8	1 1/2	58304	90600	90611	90622
3/32	1/8	3/16	1 1/2	58306	90601	90612	90623
1/8	1/8	1/4	1 1/2	58308	90602	90613	90624
5/32	3/16	5/16	2	58310	90603	90614	90625
3/16	3/16	3/8	2	58312	90604	90615	90626
7/32	1/4	1/2	2 1/2	58314	90605	90616	90627
1/4	1/4	1/2	2 1/2	58316	90606	90617	90628
9/16	5/16	1/2	2 1/2	58320	90607	90618	90629
3/8	3/8	9/16	2 1/2	58324	90608	90619	90630
7/16	7/16	9/16	3	58328	90609	90620	90631
1/2	1/2	5/8	3	58332	90610	90621	90632

# Solid Carbide Stub Length Single End Mills

Micrograin Carbide — Center Cutting  
30° Helix Angle

2-Flute & 4-Flute  
Square End & Ball Nose

Solid Carbide offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance and long tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

#### TOLERANCES

Size to 1/4" +.000 - .002  
5/16" to 3/4" +.000 - .003  
Shank Dia. +.0000 - .0005

#### STANDARD PACKAGE

All sizes - 1 each

Fraise à queue à rainurer au carbure

cortador vertical de carburo



List No. 5973 2-Flute Square End



List No. 5974 2-Flute Ball Nose



List No. 5975 4-Flute Square End



List No. 5976 4-Flute Ball Nose

Stub Length for high rigidity & minimal tool deflection.

2-Flute				SQUARE END - LIST 5973		BALL NOSE - LIST 5974	
DIA.	SHANK DIA.	LOC	OAL	UNCOATED EDP NO.	TIALN COATED EDP NO.	UNCOATED EDP NO.	TIALN COATED EDP NO.
1/32	1/8	1/16	1-1/2	57085	92860	57089	92864
3/64	1/8	3/32	1-1/2	57086	92861	57090	92865
1/16	1/8	1/8	1-1/2	57025	92800	57055	92830
3/32	1/8	3/16	1-1/2	57026	92801	57056	92831
1/8	1/8	1/4	1-1/2	57027	92802	57057	92832
5/32	3/16	5/16	2	57028	92803	57058	92833
3/16	3/16	3/8	2	57029	92804	57059	92834
7/32	1/4	7/16	2	57030	92805	57060	92835
1/4	1/4	1/2	2	57031	92806	57061	92836
5/16	5/16	1/2	2	57032	92807	57062	92837
3/8	3/8	5/8	2	57033	92808	57063	92838
7/16	7/16	5/8	2-1/2	57034	92809	57064	92839
1/2	1/2	5/8	2-1/2	57035	92810	57065	92840
5/8	5/8	3/4	3	57036	92811	57066	92841
3/4	3/4	1	3	57037	92812	57067	92842

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4-Flute				SQUARE END - LIST 5975		BALL NOSE - LIST 5976	
DIA.	SHANK DIA.	LOC	OAL	UNCOATED EDP NO.	TIALN COATED EDP NO.	UNCOATED EDP NO.	TIALN COATED EDP NO.
1/32	1/8	1/16	1-1/2	57087	92862	57091	92866
3/64	1/8	3/32	1-1/2	57088	92863	57092	92867
1/16	1/8	1/8	1-1/2	57040	92815	57070	92845
3/32	1/8	3/16	1-1/2	57041	92816	57071	92846
1/8	1/8	1/4	1-1/2	57042	92817	57072	92847
5/32	3/16	5/16	2	57043	92818	57073	92848
3/16	3/16	3/8	2	57044	92819	57074	92849
7/32	1/4	7/16	2	57045	92820	57075	92850
1/4	1/4	1/2	2	57046	92821	57076	92851
5/16	5/16	1/2	2	57047	92822	57077	92852
3/8	3/8	5/8	2	57048	92823	57078	92853
7/16	7/16	5/8	2-1/2	57049	92824	57079	92854
1/2	1/2	5/8	2-1/2	57050	92825	57080	92855
5/8	5/8	3/4	3	57051	92826	57081	92856
3/4	3/4	1	3	57052	92827	57082	92857

Tool Coatings Also Available

# Solid Carbide

## 3-Flute Single End Mills

### Micrograin Carbide — Center Cutting 30° Helix Angle

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life.

**Tool Coatings** further enhance milling performance in a wide range of applications.

**3-Flute** mills provide a compromise between the chip capacity of 2-flute mills and the tool strength, higher feed rate and improved surface finish of 4-flute mills. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron.

**Center Cutting** end allows for plunge cutting like a drill into solid material

#### TOLERANCES

Size to 1/4"	+ .000 - .002
9/32" to 1"	+ .000 - .003
Shank Dia.	+ .0000 - .0005



List No. 5941 Square End



List No. 5969 Ball Nose

**Ball Nose** end mills are designed for milling die cavities, fillets, round bottomed holes and radius bottom slots.

DIA.	SHANK DIA.	LOC	OAL	SQUARE END		BALL NOSE	
				UNCOATED EDP NO.	TIALN COATED EDP NO.	UNCOATED EDP NO.	TIALN COATED EDP NO.
1/32	1/8	1/8	1-1/2	54785	92965	54805	92985
3/64	1/8	1/8	1-1/2	54786	92966	54806	92986
1/16	1/8	1/4	1-1/2	54787	92967	54807	92987
5/64	1/8	1/4	1-1/2	54788	92968	54808	92988
3/32	1/8	3/8	1-1/2	54789	92969	54809	92989
7/64	1/8	3/8	1-1/2	54790	92970	54810	92990
1/8	1/8	1/2	1-1/2	54791	92971	54811	92991
5/32	3/16	9/16	2	54792	92972	54812	92992
3/16	3/16	5/8	2	54793	92973	54813	92993
7/32	1/4	5/8	2-1/2	54794	92974	54814	92994
1/4	1/4	3/4	2-1/2	54795	92975	54815	92995
9/32	5/16	3/4	2-1/2	54796	92976	54816	92996
5/16	5/16	13/16	2-1/2	54797	92977	54817	92997
3/8	3/8	1	2-1/2	54798	92978	54818	92998
7/16	7/16	1	2-3/4	54799	92979	54819	92999
1/2	1/2	1	3	54800	92980	54820	93000
9/16	9/16	1-1/4	3-1/2	54801	92981	54821	93001
5/8	5/8	1-1/4	3-1/2	54802	92982	54822	93002
3/4	3/4	1-1/2	4	54803	92983	54823	93003
1	1	1-1/2	4	54804	92984	54824	93004

### TOOL COATING SERVICE

Tool Coatings enhance cutting tool performance for increased productivity and lower overall tooling cost.

**TiN** — Titanium Nitride  
**TiALN** — Titanium Aluminum Nitride  
**CrN** — Chromium Nitride

**TiCN** — Titanium Carbonite  
**AlTiN** — Aluminum Titanium Nitride  
**CrC** — Chromium Carbide

# Solid Carbide 4-Flute Single End Mills

Fraise à queue à rainurer au carbure

cortador vertical de carburo



List No. 5943 Regular Length



List No. 5955 Long Length



List No. 5951 Extra Long Length

## Micrograin Carbide - Center Cutting 30° Helix Angle

**4-Flute** end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish. **Center Cutting** end allows for plunge cutting like a drill into solid material.

### TOLERANCES

Size to 1/4" +.000 - .002  
9/32" to 1" +.000 - .003  
Shank Dia. +.0000 - .0005

### List No. 5943 Regular Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/64	1/8	3/64	1 1/2	57901	90699	—	90696
1/32	1/8	1/8	1 1/2	57902	90700	—	90697
3/64	1/8	1/8	1 1/2	57903	90701	—	90698
1/16	1/8	3/16	1 1/2	57904	90702	90739	90776
5/64	1/8	3/16	1 1/2	57905	90703	90740	90777
3/32	1/8	3/8	1 1/2	57906	90704	90741	90778
7/64	1/8	3/8	1 1/2	57907	90705	90742	90779
1/8	1/8	1/2	1 1/2	57908	90706	90743	90780
9/64	3/16	9/16	2	57909	90707	90744	90781
5/32	3/16	9/16	2	57910	90708	90745	90782
11/64	3/16	5/8	2	57911	90709	90746	90783
3/16	3/16	5/8	2	57912	90710	90747	90784
13/64	1/4	5/8	2 1/2	57913	90711	90748	90785
7/32	1/4	5/8	2 1/2	57914	90712	90749	90786
1/4	1/4	3/4	2 1/2	57916	90714	90751	90788
9/32	5/16	3/4	2 1/2	57918	90716	90753	90790
5/16	5/16	13/16	2 1/2	57920	90718	90755	90792
3/8	3/8	7/8	2 1/2	57924	90722	90759	90796
7/16	7/16	7/8	2 1/2	57928	90726	90763	90800
1/2	1/2	1	3	57932	90730	90767	90804
9/16	9/16	1 1/4	3 1/2	57936	90731	90768	90805
5/8	5/8	1 1/4	3 1/2	57940	90732	90769	90806
11/16	3/4	1 1/2	4	57944	90733	90770	90807
3/4	3/4	1 1/2	4	57948	90734	90771	90808
7/8	7/8	1 1/2	4	57956	90735	90772	90809
1	1	1 1/2	4	57964	90736	90773	90810

### List No. 5955 Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	3/4	2 1/4	58138	90820	90830	90840
3/16	3/16	3/4	2 1/2	58139	90821	90831	90841
1/4	1/4	1 1/8	3	58141	90822	90832	90842
5/16	5/16	1 1/8	3	58150	90823	90833	90843
3/8	3/8	1 1/8	3	58154	90824	90834	90844
7/16	7/16	2	4	58158	90825	90835	90845
1/2	1/2	2	4	58162	90826	90836	90846
5/8	5/8	2 1/4	5	58170	90827	90837	90847
3/4	3/4	2 1/4	5	58178	90828	90838	90848
1	1	2 1/4	5	58194	90829	90839	90849

### List No. 5951 Extra Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	1	3	58508	90860	90870	90880
3/16	3/16	1 1/8	3	58512	90861	90871	90881
1/4	1/4	1 1/2	4	58516	90862	90872	90882
5/16	5/16	1 5/8	4	58520	90863	90873	90883
3/8	3/8	1 3/4	4	58524	90864	90874	90884
7/16	7/16	3	6	58528	90865	90875	90885
1/2	1/2	3	6	58532	90866	90876	90886
5/8	5/8	3	6	58540	90867	90877	90887
3/4	3/4	3	6	58548	90868	90878	90888
1	1	3	6	58564	90869	90879	90889



# Solid Carbide Metric 4-Flute Single End Mills

Fraise à queue à rainurer au carbure cortador vertical de carburo



List No. 5961

Micrograin Carbide  
Center Cutting  
30° Helix Angle

**TOLERANCE**  
All Sizes +.000mm/-.051mm  
Shank Dia. +.000mm/-.013mm

4-Flute end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish. **Center Cutting** end allows for plunge cutting like a drill into solid material.

DIA.	SHANK DIA.	LOC	OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1 mm	3 mm	3 mm	39 mm	59310	90900	90920	90940
1.5 mm	3 mm	5 mm	39 mm	59311	90901	90921	90941
2 mm	3 mm	7 mm	39 mm	59312	90902	90922	90942
2.5 mm	3 mm	7 mm	39 mm	59313	90903	90923	90943
3 mm	3 mm	9 mm	39 mm	59314	90904	90924	90944
3.5 mm	4 mm	12 mm	51 mm	59315	90905	90925	90945
4 mm	4 mm	14 mm	51 mm	59316	90906	90926	90946
4.5 mm	5 mm	14 mm	51 mm	59317	90907	90927	90947
5 mm	5 mm	16 mm	51 mm	59318	90908	90928	90948
6 mm	6 mm	19 mm	64 mm	59319	90909	90929	90949
7 mm	8 mm	19 mm	64 mm	59320	90910	90930	90950
8 mm	8 mm	21 mm	64 mm	59321	90911	90931	90951
9 mm	10 mm	22 mm	70 mm	59322	90912	90932	90952
10 mm	10 mm	22 mm	70 mm	59323	90913	90933	90953
11 mm	11 mm	25 mm	70 mm	59324	90914	90934	90954
12 mm	12 mm	25 mm	76 mm	59325	90915	90935	90955
14 mm	14 mm	31 mm	89 mm	59327	90916	90936	90956
16 mm	16 mm	32 mm	89 mm	59328	90917	90937	90957
18 mm	18 mm	35 mm	102 mm	59329	90918	90938	90958
20 mm	20 mm	38 mm	102 mm	59330	90919	90939	90959

# Solid Carbide 4-Flute Double End Mills

Fraise à queue à rainurer au carbure cortador vertical de carburo

Speeds & Feeds:  
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List No. 5946 Stub Length

Micrograin Carbide - Center Cutting  
30° Helix Angle

**STANDARD PACKAGE**  
All sizes - 1 each



List No. 5895 Regular Length

List No. 5946 Stub Length

DIA.	SHANK DIA.	LOC	OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/16	1/8	1/8	1 1/2	57270	91000	91011	91022
3/32	1/8	3/16	1 1/2	57271	91001	91012	91023
1/8	1/8	1/4	1 1/2	57272	91002	91013	91024
5/32	3/16	5/16	2	57273	91003	91014	91025
3/16	3/16	3/8	2	57274	91004	91015	91026
7/32	1/4	1/2	2 1/2	57275	91005	91016	91027
1/4	1/4	1/2	2 1/2	57276	91006	91017	91028
5/16	5/16	1/2	2 1/2	57277	91007	91018	91029
3/8	3/8	9/16	3	57278	91008	91019	91030
7/16	7/16	9/16	3	57279	91009	91020	91031
1/2	1/2	5/8	3	57280	91010	91021	91032

List No. 5895 Regular Length

DIA.	SHANK DIA.	LOC	OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/8	3/8	3/8	3 1/8	57108	91050	91060	91070
5/32	3/8	7/16	3 1/8	57110	91051	91061	91071
3/16	3/8	1/2	3 1/4	57112	91052	91062	91072
7/32	3/8	9/16	3 3/8	57114	91053	91063	91073
1/4	3/8	5/8	3 3/8	57116	91054	91064	91074
9/32	3/8	11/16	3 3/8	57118	91055	91065	91075
5/16	3/8	3/4	3 1/2	57120	91056	91066	91076
3/8	3/8	3/4	3 1/2	57124	91057	91067	91077
7/16	1/2	7/8	4	57128	91058	91068	91078
1/2	1/2	1	4	57132	91059	91069	91079

# Solid Carbide 4-Flute Ball Nose Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**4-Flute** end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique au carbure  
cortador vertical con punta esférica de carburo



List No. 5942 Regular Length



List No. 5957 Long Length



List No. 5953 Extra Long Length

## List No. 5942 Regular Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/64	1/8	3/64	1 1/2	58201	91097	—	91094
1/32	1/8	1/8	1 1/2	58202	91098	—	91095
3/64	1/8	1/8	1 1/2	58203	91099	—	91096
1/16	1/8	3/16	1 1/2	58204	91100	91123	91146
5/64	1/8	3/16	1 1/2	58205	91101	91124	91147
3/32	1/8	3/8	1 1/2	58206	91102	91125	91148
7/64	1/8	3/8	1 1/2	58207	91103	91126	91149
1/8	1/8	1/2	1 1/2	58208	91104	91127	91150
9/64	3/16	9/16	2	58209	91105	91128	91151
5/32	3/16	9/16	2	58210	91106	91129	91152
11/64	3/16	5/8	2	58211	91107	91130	91153
3/16	3/16	5/8	2	58212	91108	91131	91154
13/64	1/4	5/8	2 1/2	58213	91109	91132	91155
7/32	1/4	5/8	2 1/2	58214	91110	91133	91156
1/4	1/4	3/4	2 1/2	58216	91111	91134	91157
9/32	5/16	3/4	2 1/2	58218	91112	91135	91158
5/16	5/16	13/16	2 1/2	58220	91113	91136	91159
3/8	3/8	7/8"	2 1/2	58224	91114	91137	91160
7/16	7/16	1	2 3/4	58228	91115	91138	91161
1/2	1/2	1	3	58232	91116	91139	91162
9/16	9/16	1 1/4	3 1/2	58236	91117	91140	91163
5/8	5/8	1 1/4	3 1/2	58240	91118	91141	91164
11/16	3/4	1 1/2	4	58244	91119	91142	91165
3/4	3/4	1 1/2	4	58248	91120	91143	91166
7/8	7/8	1 1/2	4	58256	91121	91144	91167
1	1	1 1/2	4	58264	91122	91145	91168

## List No. 5957 Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	3/4	2 1/4	58838	91170	91180	91190
3/16	3/16	3/4	2 1/2	58840	91171	91181	91191
1/4	1/4	1 1/8	3	58844	91172	91182	91192
5/16	5/16	1 1/8	3	58850	91173	91183	91193
3/8	3/8	1 1/8	3	58854	91174	91184	91194
7/16	7/16	2	4	58858	91175	91185	91195
1/2	1/2	2	4	58862	91176	91186	91196
5/8	5/8	2 1/4	5	58870	91177	91187	91197
3/4	3/4	2 1/4	5	58878	91178	91188	91198
1	1	2 1/4	5	58894	91179	91189	91199

## List No. 5953 Extra Long Length

DIA.	SHANK			UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.
	DIA.	LOC	OAL				
1/8	1/8	1	3	58708	91200	91210	91220
3/16	3/16	1 1/8	3	58712	91201	91211	91221
1/4	1/4	1 1/2	4	58716	91202	91212	91222
5/16	5/16	1 5/8	4	58720	91203	91213	91223
3/8	3/8	1 3/4	4	58724	91204	91214	91224
7/16	7/16	3	6	58728	91205	91215	91225
1/2	1/2	3	6	58732	91206	91216	91226
5/8	5/8	3	6	58740	91207	91217	91227
3/4	3/4	3	6	58748	91208	91218	91228
1	1	3	6	58764	91209	91219	91229

# Solid Carbide Metric 4-Flute Ball Nose Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**4-Flute** end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

Fraise cylindrique deux tailles à bout hémisphérique au carbure

cortador vertical con punta esférica de carburo



List No. 5965

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance and long tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

**TOLERANCE**

All Sizes +.000mm/-.051mm

Shank Dia. +.000mm/-.013mm

**STANDARD PACKAGE**

All sizes - 1 each

DIA.	SHANK DIA.	LOC	OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1 mm	3 mm	3 mm	39 mm	59440	91240	91260	91280
1.5 mm	3 mm	5 mm	39 mm	59441	91241	91261	91281
2 mm	3 mm	7 mm	39 mm	59442	91242	91262	91282
2.5 mm	3 mm	7 mm	39 mm	59443	91243	91263	91283
3 mm	3 mm	9 mm	39 mm	59444	91244	91264	91284
3.5 mm	4 mm	12 mm	51 mm	59445	91245	91265	91285
4 mm	4 mm	14 mm	51 mm	59446	91246	91266	91286
4.5 mm	5 mm	14 mm	51 mm	59447	91247	91267	91287
5 mm	5 mm	16 mm	51 mm	59448	91248	91268	91288
6 mm	6 mm	19 mm	64 mm	59449	91249	91269	91289
7 mm	8 mm	19 mm	64 mm	59450	91250	91270	91290
8 mm	8 mm	21 mm	64 mm	59451	91251	91271	91291
9 mm	10 mm	22 mm	70 mm	59452	91252	91272	91292
10 mm	10 mm	22 mm	70 mm	59453	91253	91273	91293
11 mm	11 mm	25 mm	70 mm	59454	91254	91274	91294
12 mm	12 mm	25 mm	76 mm	59455	91255	91275	91295
14 mm	14 mm	31 mm	89 mm	59457	91256	91276	91296
16 mm	16 mm	32 mm	89 mm	59458	91257	91277	91297
18 mm	18 mm	35 mm	102 mm	59459	91258	91278	91298
20 mm	20 mm	38 mm	102 mm	59460	91259	91279	91299
25 mm	25 mm	38 mm	102 mm	59462*	—	—	—

\* Available While Supplies Last

# Solid Carbide 4-Flute Stub Length Ball Nose Double End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**TOLERANCES**

Size to 1/4" +.000 - .002

9/32" to 1" +.000 - .003

Shank Dia. +.0000 - .0005

**STANDARD PACKAGE**

All sizes - 1 each

Fraise cylindrique deux tailles à bout hémisphérique au carbure

cortador vertical con punta esférica de carburo



List No. 5949

**4-Flute** end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish. **Ball Nose** mills are recommended for milling die cavities, fillets, radius bottom slots and special contours. **Center Cutting** end allows for plunge cutting like a drill into solid material.

DIA.	SHANK DIA.	LOC	OAL	UNCOATED	TIN COATED	TICN COATED	TIALN COATED
				EDP NO.	EDP NO.	EDP NO.	EDP NO.
1/16	1/8	1/8	1 1/2	58354	91300	91311	91322
3/32	1/8	3/16	1 1/2	58356	91301	91312	91323
1/8	1/8	1/4	1 1/2	58358	91302	91313	91324
5/32	3/16	5/16	2	58360	91303	91314	91325
3/16	3/16	3/8	2	58362	91304	91315	91326
7/32	1/4	1/2	2 1/2	58364	91305	91316	91327
1/4	1/4	1/2	2 1/2	58366	91306	91317	91328
5/16	5/16	1/2	2 1/2	58370	91307	91318	91329
3/8	3/8	9/16	2 1/2	58374	91308	91319	91330
7/16	7/16	5/8	3	58378	91309	91320	91331
1/2	1/2	5/8	3	58382	91310	91321	91332

# Solid Carbide Corner Radius Single End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**Corner Radius** strengthens the end mill corners to minimize chipping especially in tougher milling applications. **Corner Radius** also used when the finished part requires a radius.

**2-Flute** end mills provide increased chip capacity for higher feed rates. Recommended for easy-to-machine materials including low alloy steels, non-ferrous materials and cast iron.

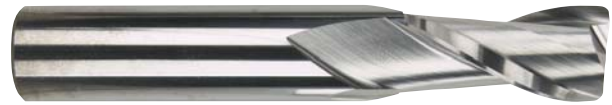
**4-Flute** end mills with a greater core thickness offer increased tool strength and reduced tool deflection. 4-Flutes also reduce chip load per tooth for the milling of tougher materials, greater wear resistance and improved surface finish.

Speeds & Feeds: Page 205

## List No. 5967 2-Flute

DIA.	SHANK		CORNER RADIUS	UNCOATED EDP NO.	TIN COATED EDP NO.	TICN COATED EDP NO.	TIALN COATED EDP NO.	
	DIA.	LOC						OAL
1/8	1/8	1/2	1 1/2	.020	58910	94830	94875	94920
3/16	3/16	5/8	2	.020	58913	94833	94878	94923
3/16	3/16	5/8	2	.030	58914	94834	94879	94924
1/4	1/4	3/4	2 1/2	.020	58916	94836	94881	94926
1/4	1/4	3/4	2 1/2	.030	58917	94837	94882	94927
5/16	5/16	13/16	2 1/2	.020	58920	94840	94885	94930
5/16	5/16	13/16	2 1/2	.030	58921	94841	94886	94931
3/8	3/8	1	2 1/2	.020	58924	94844	94889	94934
3/8	3/8	1	2 1/2	.030	58925	94845	94890	94935
1/2	1/2	1	3	.020	58929	94849	94894	94939
1/2	1/2	1	3	.030	58930	94850	94895	94940
1/2	1/2	1	3	.060	58932	94852	94897	94942
5/8	5/8	1 1/4	3 1/2	.020	58936	94856	94901	94946
5/8	5/8	1 1/4	3 1/2	.030	58937	94857	94902	94947
5/8	5/8	1 1/4	3 1/2	.060	58939	94859	94904	94949
5/8	5/8	1 1/4	3 1/2	.090	58940	94860	94905	94950
3/4	3/4	1 1/2	4	.020	58942	94862	94907	94952
3/4	3/4	1 1/2	4	.030	58943	94863	94908	94953
3/4	3/4	1 1/2	4	.060	58945	94865	94910	94955
3/4	3/4	1 1/2	4	.090	58946	94866	94911	94956
3/4	3/4	1 1/2	4	.125	58947	94867	94912	94957
1	1	1 1/2	4	.020	58949	94869	94914	94959
1	1	1 1/2	4	.030	58950	94870	94915	94960
1	1	1 1/2	4	.060	58952	94872	94917	94962
1	1	1 1/2	4	.090	58953	94873	94918	94963
1	1	1 1/2	4	.125	58954	94874	94919	94964

Fraise à queue à rainurer de rayon de bec au carbure  
cortador vertical con radio de esquina de carburo



List No. 5967 2-Flute



List No. 5968 4-Flute

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance, and long tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

### TOLERANCES

Size to 1/4" +.000 - .002  
5/16" to 1" +.000 - .003  
Shank Dia. +.0000 - .0005

### STANDARD PACKAGE

All sizes - 1 each

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Solid Carbide Corner Radius Single End Mills

Fraise à queue à rainurer de rayon de bec au carbure

List No. 5968 **4-Flute**

cortador vertical con radio de esquina de carburo

DIA.	SHANK		CORNER RADIUS	UNCOATED	TIN COATED	TICN COATED	TIALN COATED	
	DIA.	LOC		EDP NO.	EDP NO.	EDP NO.	EDP NO.	
1/8	1/8	1/2	1 1/2	.020	59000	94965	95010	95055
3/16	3/16	5/8	2	.020	59003	94968	95013	95058
3/16	3/16	5/8	2	.030	59004	94969	95014	95059
1/4	1/4	3/4	2 1/2	.020	59006	94971	95016	95061
1/4	1/4	3/4	2 1/2	.030	59007	94972	95017	95062
5/16	5/16	13/16	2 1/2	.020	59010	94975	95020	95065
5/16	5/16	13/16	2 1/2	.030	59011	94976	95021	95066
3/8	3/8	1	2 1/2	.020	59014	94979	95024	95069
3/8	3/8	1	2 1/2	.030	59015	94980	95025	95070
1/2	1/2	1	3	.020	59019	94984	95029	95074
1/2	1/2	1	3	.030	59020	94985	95030	95075
1/2	1/2	1	3	.060	59022	94987	95032	95077
5/8	5/8	1 1/4	3 1/2	.020	59026	94991	95036	95081
5/8	5/8	1 1/4	3 1/2	.030	59027	94992	95037	95082
5/8	5/8	1 1/4	3 1/2	.060	59029	94994	95039	95084
5/8	5/8	1 1/4	3 1/2	.090	59030	94995	95040	95085
3/4	3/4	1 1/2	4	.020	59032	94997	95042	95087
3/4	3/4	1 1/2	4	.030	59033	94998	95043	95088
3/4	3/4	1 1/2	4	.060	59035	95000	95045	95090
3/4	3/4	1 1/2	4	.090	59036	95001	95046	95091
3/4	3/4	1 1/2	4	.125	59037	95002	95047	95092
1	1	1 1/2	4	.020	59039	95004	95049	95094
1	1	1 1/2	4	.030	59040	95005	95050	95095
1	1	1 1/2	4	.060	59042	95007	95052	95097
1	1	1 1/2	4	.090	59043	95008	95053	95098
1	1	1 1/2	4	.125	59044	95009	95054	95099

## TOOL COATINGS

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish.

### TiN – Titanium Nitride

A good general purpose coating for a wide range of ferrous materials. Not recommended for non-ferrous materials. Has higher heat resistance than TiCN coating.

### TiCN – Titanium Carbonitride

Enhanced toughness, hardness & wear resistance for aggressive speeds & feeds. Recommended for difficult-to-machine, gummy & abrasive materials where moderate cutting temperatures are generated.

### TiALN – Titanium Aluminum Nitride

### ALTiN – Aluminum Titanium Nitride

Excellent all around coatings featuring high heat resistance. Recommended for high thermal stress applications including dry machining, abrasive materials and hard-to-machine materials that generate higher cutting temperatures. ALTiN has higher AL content for increased hardness & heat resistance.

### CrN – Chromium Nitride

### CrC – Chromium Carbide

Especially recommended for titanium and non-ferrous materials including aluminum, copper & brass. CrC has slightly higher hardness than CrN. These coatings resist adhesion of the material being machined and resist chipping and cracking.

### DLC – Diamond Like Carbon

A thin carbon based amorphous (non-crystalline) coating featuring very high hardness & low coefficient of friction. Highly recommended for non-ferrous materials including plastic, aluminum, copper & brass. Typically used on solid carbide tools.

# Solid Carbide Miniature Decimal Size Stub Length Single End Mills

Fraise à queue à rainurer au carbure

cortador vertical de carburo

Micrograin Carbide - Center Cutting

30° Helix Angle

2-Flute &amp; 4-Flute

Square End &amp; Ball Nose

1/8" Shank Dia. • 1-1/2" OAL

Solid Carbide offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance, and long tool life.

Stub Length provides increased rigidity in shallow milling applications.

Tool Coatings Also Available



List No. 5906 — 2-Flute Square End



List No. 5907 — 2-Flute Ball Nose



List No. 5908 — 4-Flute Square End



List No. 5909 — 4-Flute Ball Nose

**TOLERANCES**

Dia. +.0005 - .0005

Shank Dia. +.0000 - .0003

DIA.	SHANK DIA.	LOC	OAL	LIST 5906 2-FLUTE SQUARE EDP NO.	LIST 5907 2-FLUTE BALL NOSE EDP NO.	LIST 5908 4-FLUTE SQUARE EDP NO.	LIST 5909 4-FLUTE BALL NOSE EDP NO.
.010	1/8	.015	1-1/2	52430	52455	52480	52505
.015	1/8	.023	1-1/2	52431	52456	52481	52506
.020	1/8	.030	1-1/2	52432	52457	52482	52507
.025	1/8	.038	1-1/2	52433	52458	52483	52508
.030	1/8	.045	1-1/2	52434	52459	52484	52509
.035	1/8	.053	1-1/2	52435	52460	52485	52510
.040	1/8	.060	1-1/2	52436	52461	52486	52511
.045	1/8	.068	1-1/2	52437	52462	52487	52512
.050	1/8	.075	1-1/2	52438	52463	52488	52513
.055	1/8	.083	1-1/2	52439	52464	52489	52514
.060	1/8	.090	1-1/2	52440	52465	52490	52515
.065	1/8	.098	1-1/2	52441	52466	52491	52516
.070	1/8	.105	1-1/2	52442	52467	52492	52517
.075	1/8	.113	1-1/2	52443	52468	52493	52518
.080	1/8	.120	1-1/2	52444	52469	52494	52519
.085	1/8	.128	1-1/2	52445	52470	52495	52520
.090	1/8	.135	1-1/2	52446	52471	52496	52521
.095	1/8	.143	1-1/2	52447	52472	52497	52522
.100	1/8	.150	1-1/2	52448	52473	52498	52523
.105	1/8	.158	1-1/2	52449	52474	52499	52524
.110	1/8	.165	1-1/2	52450	52475	52500	52525
.115	1/8	.173	1-1/2	52451	52476	52501	52526
.120	1/8	.180	1-1/2	52452	52477	52502	52527

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

# Solid Carbide Miniature Decimal Size Regular Length Single End Mills

Fraise à queue à rainurer au carbure

cortador vertical de carburo

Micrograin Carbide - Center Cutting

30° Helix Angle

2-Flute & 4-Flute

Square End & Ball Nose

1/8" Shank Dia. • 1-1/2" OAL

Solid Carbide offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance, and long tool life.

## TOLERANCES

Dia. +.0005 - .0005

Shank Dia. +.0000 - .0003



List No. 5910 — 2-Flute Square End



List No. 5911 — 2-Flute Ball Nose



List No. 5912 — 4-Flute Square End



List No. 5913 — 4-Flute Ball Nose

DIA.	SHANK DIA.	LOC	OAL	LIST 5910 2-FLUTE SQUARE EDP NO.	LIST 5911 2-FLUTE BALL NOSE EDP NO.	LIST 5912 4-FLUTE SQUARE EDP NO.	LIST 5913 4-FLUTE BALL NOSE EDP NO.
.005	1/8	.015	1-1/2	52530	—	52680	—
.006	1/8	.018	1-1/2	52531	—	52681	—
.007	1/8	.021	1-1/2	52532	—	52682	—
.008	1/8	.024	1-1/2	52533	—	52683	—
.009	1/8	.027	1-1/2	52534	—	52684	—
.010	1/8	.030	1-1/2	52535	52610	52685	52760
.011	1/8	.033	1-1/2	52536	52611	52686	52761
.012	1/8	.036	1-1/2	52537	52612	52687	52762
.013	1/8	.039	1-1/2	52538	52613	52688	52763
.014	1/8	.042	1-1/2	52539	52614	52689	52764
.015	1/8	.045	1-1/2	52540	52615	52690	52765
.016	1/8	.048	1-1/2	52541	52616	52691	52766
.017	1/8	.051	1-1/2	52542	52617	52692	52767
.018	1/8	.054	1-1/2	52543	52618	52693	52768
.019	1/8	.057	1-1/2	52544	52619	52694	52769
.020	1/8	.060	1-1/2	52545	52620	52695	52770
.021	1/8	.063	1-1/2	52546	52621	52696	52771
.022	1/8	.066	1-1/2	52547	52622	52697	52772
.023	1/8	.069	1-1/2	52548	52623	52698	52773
.024	1/8	.072	1-1/2	52549	52624	52699	52774
.025	1/8	.075	1-1/2	52550	52625	52700	52775
.026	1/8	.078	1-1/2	52551	52626	52701	52776
.027	1/8	.081	1-1/2	52552	52627	52702	52777
.028	1/8	.084	1-1/2	52553	52628	52703	52778
.029	1/8	.087	1-1/2	52554	52629	52704	52779
.030	1/8	.090	1-1/2	52555	52630	52705	52780
.031	1/8	.093	1-1/2	52556	52631	52706	52781
.032	1/8	.096	1-1/2	52557	52632	52707	52782
.033	1/8	.099	1-1/2	52558	52633	52708	52783
.034	1/8	.102	1-1/2	52559	52634	52709	52784
.035	1/8	.105	1-1/2	52560	52635	52710	52785
.036	1/8	.108	1-1/2	52561	52636	52711	52786
.037	1/8	.111	1-1/2	52562	52637	52712	52787
.038	1/8	.114	1-1/2	52563	52638	52713	52788
.039	1/8	.117	1-1/2	52564	52639	52714	52789

Tool Coatings Also Available

(continued)

# Solid Carbide Miniature Decimal Size Regular Length Single End Mills

Micrograin Carbide - Center Cutting

30° Helix Angle

2-Flute & 4-Flute

Square End & Ball Nose

1/8" Shank Dia. • 1-1/2" OAL

Solid Carbide offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance, and long tool life.

## TOLERANCES

Dia. +.0005 - .0005

Shank Dia. +.0000 - .0003

(continued)

Fraise à queue à rainurer au carbure

cortador vertical de carburo



List No. 5910 — 2-Flute Square End



List No. 5911 — 2-Flute Ball Nose



List No. 5912 — 4-Flute Square End



List No. 5913 — 4-Flute Ball Nose

DIA.	SHANK DIA.	LOC	OAL	LIST 5910 2-FLUTE SQUARE EDP NO.	LIST 5911 2-FLUTE BALL NOSE EDP NO.	LIST 5912 4-FLUTE SQUARE EDP NO.	LIST 5913 4-FLUTE BALL NOSE EDP NO.
.040	1/8	.120	1-1/2	52565	52640	52715	52790
.041	1/8	.123	1-1/2	52566	52641	52716	52791
.042	1/8	.126	1-1/2	52567	52642	52717	52792
.043	1/8	.129	1-1/2	52568	52643	52718	52793
.044	1/8	.132	1-1/2	52569	52644	52719	52794
.045	1/8	.135	1-1/2	52570	52645	52720	52795
.046	1/8	.138	1-1/2	52571	52646	52721	52796
.047	1/8	.141	1-1/2	52572	52647	52722	52797
.048	1/8	.144	1-1/2	52573	52648	52723	52798
.049	1/8	.147	1-1/2	52574	52649	52724	52799
.050	1/8	.150	1-1/2	52575	52650	52725	52800
.051	1/8	.153	1-1/2	52576	52651	52726	52801
.052	1/8	.156	1-1/2	52577	52652	52727	52802
.053	1/8	.159	1-1/2	52578	52653	52728	52803
.054	1/8	.162	1-1/2	52579	52654	52729	52804
.055	1/8	.165	1-1/2	52580	52655	52730	52805
.056	1/8	.168	1-1/2	52581	52656	52731	52806
.057	1/8	.171	1-1/2	52582	52657	52732	52807
.058	1/8	.174	1-1/2	52583	52658	52733	52808
.059	1/8	.177	1-1/2	52584	52659	52734	52809
.060	1/8	.180	1-1/2	52585	52660	52735	52810
.061	1/8	.183	1-1/2	52586	52661	52736	52811
.062	1/8	.186	1-1/2	52587	52662	52737	52812
.063	1/8	.189	1-1/2	52588	52663	52738	52813
.064	1/8	.192	1-1/2	52589	52664	52739	52814
.065	1/8	.195	1-1/2	52590	52665	52740	52815
.070	1/8	.210	1-1/2	52591	52666	52741	52816
.075	1/8	.225	1-1/2	52592	52667	52742	52817
.080	1/8	.240	1-1/2	52593	52668	52743	52818
.085	1/8	.255	1-1/2	52594	52669	52744	52819
.090	1/8	.270	1-1/2	52595	52670	52745	52820
.095	1/8	.285	1-1/2	52596	52671	52746	52821
.100	1/8	.300	1-1/2	52597	52672	52747	52822
.105	1/8	.315	1-1/2	52598	52673	52748	52823
.110	1/8	.330	1-1/2	52599	52674	52749	52824
.115	1/8	.345	1-1/2	52600	52675	52750	52825
.120	1/8	.360	1-1/2	52601	52676	52751	52826



# CARBIDE DRILL-MILL™

2-Flute & 4-Flute

## Micrograin Carbide • 30° Right Hand Helix

**DRILL-MILL performs** drilling, spotting, countersinking, chamfering, slotting, side milling, profile milling, "V" grooving and other drilling & milling operations with the same tool in vertical milling machine applications.

**Solid Carbide** offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

TOLERANCE +.000 - .002

Fraise de forage au carbure Broca fresadora de carburo



List No. 5989 - 2-Flute



List No. 5989 - 4-Flute

STANDARD PACKAGE All sizes — 1 each

Speeds & Feeds: Page 205

## 2-Flute 90° Point Angle

DIA.	SHANK		OAL*	UNCOATED	TiN COATED	TiCN COATED	TiAlN COATED
	DIA.	LOC*		EDP NO.	EDP NO.	EDP NO.	EDP NO.
.030	1/8	.090	1 1/2	59055	—	—	95356
.045	1/8	.105	1 1/2	59056	—	—	95357
.060	1/8	.180	1 1/2	59057	—	—	95358
1/16	1/8	3/16	1 1/2	59058	—	—	95359
3/32	1/8	3/8	1 1/2	59059	—	—	95360
1/8	1/8	1/2	1 1/2	59060	95300	95320	95340
1/8**	1/8	1/2	1 1/2	59061	95301	95321	95341
3/16	3/16	5/8	2	59062	95302	95322	95342
3/16**	3/16	5/8	2	59063	95303	95323	95343
1/4	1/4	3/4	2 1/2	59064	95304	95324	95344
1/4**	1/4	3/4	2 1/2	59065	95305	95325	95345
5/16	5/16	13/16	2 1/2	59066	95306	95326	95346
5/16**	5/16	13/16	2 1/2	59067	95307	95327	95347
3/8	3/8	1	2 1/2	59068	95308	95328	95348
3/8**	3/8	1	2 1/2	59069	95309	95329	95349
7/16	7/16	1	2 3/4	59070	95310	95330	95350
1/2	1/2	1	3	59071	95311	95331	95351
1/2**	1/2	1	3	59072	95312	95332	95352
5/8	5/8	1 1/4	3 1/2	59073	95313	95333	95353
5/8**	5/8	1 1/4	3 1/2	59074	95314	95334	95354
3/4	3/4	1 1/2	4	59075	95315	95335	95355

\* Lengths include the conical cutting point

\*\* Features sharper point with a .005"/.008" tip diameter for "V" grooving where a sharper point is required. (Standard carbide Drill-Mills supplied with tip diameter of .030" or larger to provide strength.)

## 2-Flute 60° Point Angle

DIA.	SHANK		OAL*	UNCOATED	TiAlN COATED
	DIA.	LOC*		EDP NO.	EDP NO.
1/16	1/8	3/16	1 1/2	59076	95361
3/32	1/8	3/8	1 1/2	59077	95362
1/8	1/8	1/2	1 1/2	59078	95363
3/16	3/16	5/8	2	59079	95364
1/4	1/4	3/4	2 1/2	59080	95365
3/8	3/8	1	2 1/2	59081	95366
1/2	1/2	1	3	59082	95367
5/8	5/8	1 1/4	3 1/2	59083	95368
3/4	3/4	1 1/2	4	59084	95369

## 4-Flute 90° Point Angle

DIA.	SHANK		OAL*	UNCOATED	TiAlN COATED
	DIA.	LOC*		EDP NO.	EDP NO.
1/16	1/8	3/16	1 1/2	59085	95370
3/32	1/8	3/8	1 1/2	59086	95371
1/8	1/8	1/2	1 1/2	59087	95372
3/16	3/16	5/8	2	59088	95373
1/4	1/4	3/4	2 1/2	59089	95374
3/8	3/8	1	2 1/2	59090	95375
1/2	1/2	1	3	59091	95376
5/8	5/8	1 1/4	3 1/2	59092	95377
3/4	3/4	1 1/2	4	59093	95378

\* Lengths include the conical cutting point.

# Solid Carbide Roughing / Finishing Single End Mills

## Micrograin Carbide - Center Cutting 3-Flute & 4-Flute - Corner Radius

Chipbreaker geometry permits high feed rates in roughing operations while producing a finish near that produced by standard end mills. Benefits include smaller more manageable chips and reduced cutting forces, chatter, deflection & horsepower required. Increased productivity with longer tool life. Recommended for aggressive milling in stainless steels, difficult-to-machine materials and wide range of other materials.

**Corner Radius** strengthens the end mill corners to minimize chipping especially in tougher milling applications. **Corner Radius** also used when the finished part requires a radius.

**Titanium Aluminum Nitride (TiAlN) Coating** is an excellent all around coating that increases surface hardness, wear resistance, heat resistance, chip flow and resist chip welding. Especially recommended for abrasive and hard-to-machine materials that generate higher cutting temperatures.

Fewer flutes provide increased chip capacity. Especially recommended for slotting & pocket milling applications.

Fraise à queue à rainurer de dégrossissage et de finition au carbure  
cortador vertical de carburo para desbaste/acabado



List No. 5928 3-Flute Corner Radius



List No. 5929 4-Flute Corner Radius

### TOLERANCES

Dia.                   +.000 - .002  
Shank Dia.       +.0000 - .0005

Also Available  
in Ball Nose

Please inquire

## 3-Flute

DIA.	SHANK DIA.	LOC	OAL	CORNER RADIUS	LIST 5928 UNCOATED EDP NO.	LIST 5928T TiAlN COATED EDP NO.
1/8	1/8	1/2	1-1/2	.005 - .010	57455	92350
3/16	3/16	5/8	2	.005 - .010	57456	92351
1/4	1/4	3/4	2-1/2	.005 - .010	57457	92352
5/16	5/16	13/16	2-1/2	.005 - .010	57458	92353
3/8	3/8	1	2-1/2	.010 - .015	57459	92354
7/16	7/16	1	2-3/4	.010 - .015	57460	92355
1/2	1/2	1	3	.010 - .015	57461	92356
5/8	5/8	1-1/4	3-1/2	.015 - .020	57462	92357
3/4	3/4	1-1/2	4	.015 - .020	57463	92358
1	1	1-1/2	4	.015 - .020	57464	92359

## 4-Flute

DIA.	SHANK DIA.	LOC	OAL	CORNER RADIUS	LIST 5929 UNCOATED EDP NO.	LIST 5929T TiAlN COATED EDP NO.
1/8	1/8	1/2	1-1/2	.005 - .010	57465	92360
3/16	3/16	5/8	2	.005 - .010	57466	92361
1/4	1/4	3/4	2-1/2	.005 - .010	57467	92362
5/16	5/16	13/16	2-1/2	.005 - .010	57468	92363
3/8	3/8	1	2-1/2	.010 - .015	57469	92364
7/16	7/16	1	2-3/4	.010 - .015	57470	92365
1/2	1/2	1	3	.010 - .015	57471	92366
5/8	5/8	1-1/4	3-1/2	.015 - .020	57472	92367
3/4	3/4	1-1/2	4	.015 - .020	57473	92368
1	1	1-1/2	4	.015 - .020	57474	92369

Tool Coatings Also Available

# Solid Carbide Multi-Flute Roughing End Mills

Micrograin Carbide - Center Cutting  
30° Helix Angle

**Roughing** end mills feature a chip breaker type cutting edge for heavier cuts, higher speeds and feeds and greatly increased productivity. Recommended for a wide range of materials including mild steel, steel alloys, stainless steel, cast iron and many other applications. **Center Cutting** end allows for plunge cutting like a drill into solid material.

**Solid Carbide** offers higher cutting speeds, high rigidity, excellent hardness, wear resistance and heat resistance and long tool life. **Tool Coatings** further enhance milling performance in a wide range of applications.

Fraise à queue à rainurer de dégrossissage au carbure  
cortador vertical de carburo para desbaste



List No. 5972G — TiN Coated

List No. 5972C — TiCN Coated

STANDARD PACKAGE  
All sizes - 1 each

DIA.	SHANK DIA.	LOC	OAL	NO. OF FLUTES	TIN COATED EDP NO.	TICN COATED EDP NO.
1/4	1/4	3/4	2 1/2	4	56760	56780
5/16	5/16	13/16	2 1/2	4	56761	56781
3/8	3/8	1	2 1/2	4	56762	56782
1/2	1/2	1 1/4	3	4	56764	56784
5/8	5/8	1 1/4	3 1/2	4	56765	56785
3/4	3/4	1 1/2	4	4	56766	56786

\* Available while supplies last

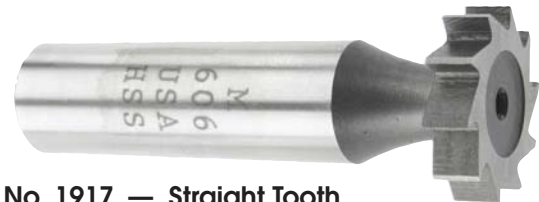
# Woodruff Keyseat Cutters

High Speed Steel — 1/2" Dia. Shank

**Woodruff Keyseat** cutters are designed for cutting keyways and keyseats in a wide variety of materials.

STANDARD PACKAGE All sizes — 1 each.

Fraise à rainure de clavette  
Cortachaveteros cortador de ranuras



List No. 1917 — Straight Tooth

AMERICAN STANDARD NO.	DIA.	WIDTH	OAL	EDP NO.
202	1/4	1/16	2 1/16	40526
202 1/2	5/16	1/16	2 1/16	40527
302 1/2	5/16	3/32	2 3/32	40528
203	3/8	1/16	2 1/16	40529
303	3/8	3/32	2 3/32	40530
403	3/8	1/8	2 1/8	40531
204	1/2	1/16	2 1/16	40532
304	1/2	3/32	2 3/32	40533
305	5/8	3/32	2 3/32	40534
404	1/2	1/8	2 1/8	40535
405	5/8	1/8	2 1/8	40536
406	3/4	1/8	2 1/8	40537
505	5/8	5/32	2 5/32	40538
605	5/8	3/16	2 3/16	40539
506	3/4	5/32	2 5/32	40540
806	3/4	1/4	2 1/4	40541
507	7/8	5/32	2 5/32	40542
606	3/4	3/16	2 3/16	40543
607	7/8	3/16	2 3/16	40544
707	7/8	7/32	2 7/32	40545

AMERICAN STANDARD NO.	DIA.	WIDTH	OAL	EDP NO.
608	1	3/16	2 3/16	40546
708	1	7/32	2 7/32	40547
1208	1	3/8	2 3/8	40548
609	1 1/8	3/16	2 3/16	40549
807	7/8	1/4	2 1/4	40550
808	1	1/4	2 1/4	40551
709	1 1/8	7/32	2 7/32	40552
809	1 1/8	1/4	2 1/4	40553
610	1 1/4	3/16	2 3/16	40554
710	1 1/4	7/32	2 7/32	40555
810	1 1/4	1/4	2 1/4	40556
811	1 3/8	1/4	2 1/4	40557
812	1 1/2	1/4	2 1/4	40558
1008	1	5/16	2 5/16	40559
1010	1 1/4	5/16	2 5/16	40561
1012	1 1/2	5/16	2 5/16	40563
1210	1 1/4	3/8	2 3/8	40564
1211	1 3/8	3/8	2 3/8	40565
1212	1 1/2	3/8	2 3/8	40566

# TOOL BITS

<b>CARBIDE TIPPED TOOL BITS - PREMIUM GRADE</b>	<b>PAGE NO.</b>
Turning Tools	
Styles: AR, AL, BR, BL . . . . .	252
Styles: C, D . . . . .	253
Threading Tools	
Styles: E, ER, EL . . . . .	254
Cut-Off Tools	
Styles: CTR, CTL . . . . .	255
Swiss Automatic Tools	
Types: T, C . . . . .	255
Boring Tools	
Types: TSA, TSC, TSE, TRG, TRC, TRE . . . . .	256

<b>CARBIDE TIPPED TOOL BITS - STANDARD GRADE</b>	
Turning Tools	
Styles: AR, AL, BR, BL . . . . .	257
Styles: C, D . . . . .	258
Threading Tools	
Style: E . . . . .	258
Offset Tools	
Styles: FR, FL . . . . .	259
Cut-Off Tools	
Styles: CTR, CTL . . . . .	259

<b>STEEL TOOL BITS</b>	
M2 High Speed Steel	
Square . . . . .	251
M42 Cobalt	
Square . . . . .	251
Rectangular . . . . .	251
Round . . . . .	251
T15 Cobalt	
Square . . . . .	251

**Tool Coatings Also Available**

# Square Tool Bits

**STANDARD PACKAGE** 3/16 thru 3/8 — 10 each  
7/16 thru 1/2 — 5 each  
5/8 thru 1 — 1 each

Outil rapporté

Buril



## OR-BIT™

### M2 Square Tool Bits

For General Purpose Applications  
High Speed Steel — M2

**M2 - High Speed Steel** is recommended for general purpose use in a wide range of materials. It has excellent toughness and shock resistance for interrupted cuts and is relatively easy to grind.

#### List No. 4202S — Square M2 HSS

SIZE	OAL	EDP NO.	SIZE	OAL	EDP NO.
3/16	2 1/2	28014	1/2	4	28022
1/4	2 1/2	28015	5/8	4 1/2	28024
5/16	2 1/2	28017	3/4	5	28025
3/8	3	28019	1	7	28026
7/16	3 1/2	28021			

## OR-BIT™

### T15 Cobalt Square Tool Bits

For Toughest Applications  
Premium Cobalt Steel — T15

**T15 - Cobalt Steel** offers the best wear resistance and high heat resistance for abrasive and difficult materials that generate higher cutting temperatures. It's toughness is adequate for most applications where a rigid setup is used.

#### List No. 4215S — Square T15 Cobalt

SIZE	OAL	EDP NO.	SIZE	OAL	EDP NO.
3/16	2 1/2	28101	1/2	4	28106
1/4	2 1/2	28102	5/8	4 1/2	28108
5/16	2 1/2	28103	3/4	5	28109
3/8	3	28104	1	7	28111

## OR-BIT™

### M42 Cobalt Tool Bits

For Heavy Duty Applications  
Premium Cobalt Steel - M-42

**STANDARD PACKAGE** 3/16" thru 3/8" — 10 each  
7/16" thru 1/2" — 5 each  
5/8" thru 1" — 1 each

**M42 - Cobalt Steel** features excellent wear and highest heat resistance and is recommended for difficult materials that generate higher cutting temperatures and for longer tool life.



#### List No. 4226S — Square

SIZE	OAL	EDP NO.	SIZE	OAL	EDP NO.
3/16	2 1/2	28301	1/2	4	28306
1/4	2 1/2	28302	5/8	4 1/2	28308
5/16	2 1/2	28303	3/4	5	28309
3/8	3	28304	7/8	6	28310
7/16	3 1/2	28305	1	7	28311

#### List No. 4226F — Rectangular

SIZE				SIZE			
WIDTH	HEIGHT	OAL	EDP NO.	WIDTH	HEIGHT	OAL	EDP NO.
1/4	1/2	4	28352	3/8	3/4	6	28377
3/8	1/2	4	28356	1/2	3/4	6	28379
3/8	5/8	4	28375	1/2	1	8	28361
3/8	5/8	6	28376	3/4	1	6	28380

#### List No. 4226R — Round



SIZE	OAL	EDP NO.
5/16	3	28216*
5/16	4	28217*
3/8	4	28218*
1/2	4	28219*
5/8	4	28220*

\*Available While Supplies Last

# Styles AR & AL 0° Lead Angle Turning Tools

Premium Carbide Tipped

For turning to a square shoulder

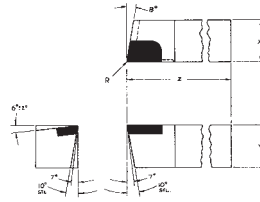
STANDARD PACKAGE A4-A10 — 10 each  
A12 — 5 each A16-A44 — 1 each

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4110



**GRADE 883E = C2**  
For use in cast iron  
and non-ferrous  
materials

**GRADE 370E = C5**  
For use in steel  
and steel alloys

## Style AR – Right Hand

TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
AR-4	1/4	1/4	2	1/64	70102	70103
AR-5	5/16	5/16	2 1/4	1/64	70108	70109
AR-6	3/8	3/8	2 1/2	1/64	70114	70115
AR-7	7/16	7/16	3	1/32	70120	70121
AR-8	1/2	1/2	3 1/2	1/32	70126	70127
AR-10	5/8	5/8	4	1/32	70132	70133
AR-12	3/4	3/4	4 1/2	1/32	70138	70139
AR-16	1	1	7	1/32	70144	70145
AR-20	1 1/4	1 1/4	8	1/32	70150*	—
AR-44	1/2	1	7	1/32	—	70163*

## Style AL – Left Hand

TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
AL-4	1/4	1/4	2	1/64	70202	70203
AL-5	5/16	5/16	2 1/4	1/64	70208	70209
AL-6	3/8	3/8	2 1/2	1/64	70214	70215
AL-7	7/16	7/16	3	1/32	70220	70221
AL-8	1/2	1/2	3 1/2	1/32	70226	70227
AL-10	5/8	5/8	4	1/32	70232	70233
AL-12	3/4	3/4	4 1/2	1/32	70238	70239
AL-16	1	1	7	1/32	70244	70245

\*Available While Supplies Last

# Styles BR & BL 15° Lead Angle Turning Tools

Premium Carbide Tipped

For turning when a square shoulder is not required  
and for interrupted cuts.

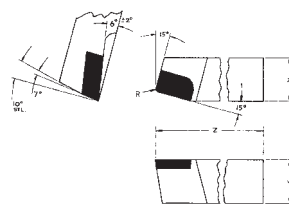
STANDARD PACKAGE B4-B10 — 10 each  
B12 — 5 each B16-B20 — 1 each

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4120



**GRADE 883E = C2**  
For use in cast iron  
and non-ferrous  
materials

**GRADE 370E = C5**  
For use in steel  
and steel alloys

## Style BR – Right Hand

TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
BR-4	1/4	1/4	2	1/64	70302	70303
BR-5	5/16	5/16	2 1/4	1/64	70308	70309
BR-6	3/8	3/8	2 1/2	1/64	70314	70315
BR-7	7/16	7/16	3	1/32	70320	70321
BR-8	1/2	1/2	3 1/2	1/32	70326	70327
BR-10	5/8	5/8	4	1/32	70332	70333
BR-12	3/4	3/4	4 1/2	1/32	70338	70339
BR-16	1	1	7	1/32	70344	70345
BR-20	1 1/4	1 1/4	8	1/32	70350*	—

## Style BL – Left Hand

TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
BL-4	1/4	1/4	2	1/64	70402	70403
BL-5	5/16	5/16	2 1/4	1/64	70408	70409
BL-6	3/8	3/8	2 1/2	1/64	70414	70415
BL-7	7/16	7/16	3	1/32	70420	70421
BL-8	1/2	1/2	3 1/2	1/32	70426	70427
BL-10	5/8	5/8	4	1/32	70432	70433
BL-12	3/4	3/4	4 1/2	1/32	70438	70439
BL-16	1	1	7	1/32	70444	70445
BL-20	1 1/4	1 1/4	8	1/32	70450*	70451*

\*Available While Supplies Last

# Style C Square Nose Tools

Outil rapporté à pointe au carbure

Buril con punta de carburo

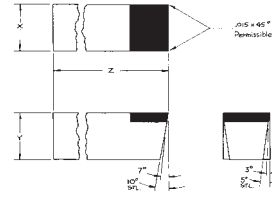
Premium Carbide Tipped

For chamfering, facing, turning and for making special tool forms

**STANDARD PACKAGE** C4-C10 — 10 each C12 — 5 each C16 — 1 each



List No. 4130



**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

**GRADE 370E = C5**  
For use in steel and steel alloys

TOOL NO.	SHANK SIZE			GRADE 883E	GRADE 370E
	W	H	L	EDP NO.	EDP NO.
C-4	1/4	1/4	2	70502	70503
C-5	5/16	5/16	2 1/4	70508	70509
C-6	3/8	3/8	2 1/2	70514	70515
C-7	7/16	7/16	3	70520	70521
C-8	1/2	1/2	3 1/2	70526	70527
C-10	5/8	5/8	4	70532	70533
C-12	3/4	3/4	4 1/2	70538	70539
C-16	1	1	7	70544	70545

# Style D 80° Included Angle Tools

Outil rapporté à pointe au carbure

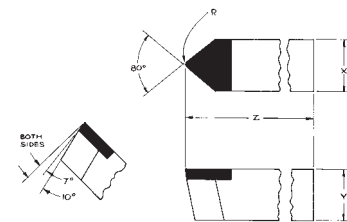
Buril con punta de carburo

Premium Carbide Tipped

For under cutting and for ID and OD chamfering

**STANDARD PACKAGE** D4-D10 — 10 each D12 — 5 each D16 — 1 each

List No. 4140



**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

**GRADE 370E = C5**  
For use in steel and steel alloys

TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
D-4	1/4	1/4	2	1/64	70602	70603
D-5	5/16	5/16	2 1/4	1/64	70608	70609
D-6	3/8	3/8	2 1/2	1/64	70614	70615
D-7	7/16	7/16	3	1/32	70620	70621
D-8	1/2	1/2	3 1/2	1/32	70626	70627
D-10	5/8	5/8	4	1/32	70632	70633
D-12	3/4	3/4	4 1/2	1/32	70638	70639
D-16	1	1	7	1/32	70644	70645

# Style E

## 60° Included Angle Threading Tools

Premium Carbide Tipped

For standard 60° threading, boring, V-grooving and other applications

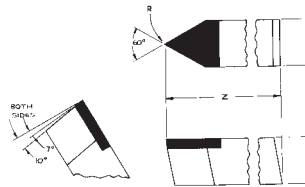
STANDARD PACKAGE E4-E10 — 10 each  
E12 — 5 each

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4150



**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

**GRADE 370E = C5**  
For use in steel and steel alloys

TOOL NO.	SHANK SIZE			GRADE 883E	GRADE 370E
	W	H	L	EDP NO.	EDP NO.
E-4	1/4	1/4	2	70701	70702
E-5	5/16	5/16	2 1/4	70705	70706
E-6	3/8	3/8	2 1/2	70709	70710
E-8	1/2	1/2	3 1/2	70713	70714
E-10	5/8	5/8	4	70717	70718
E-12	3/4	3/4	4 1/2	70721	70722

Outil rapporté à pointe au carbure

Buril con punta de carburo

# Styles ER & EL

## 60° Included Angle Offset Threading Tools

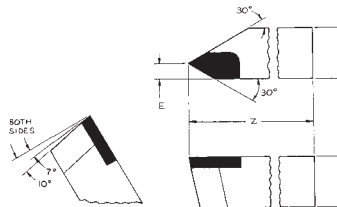
Premium Carbide Tipped

Offset for standard 60° threading, boring, V-grooving and other applications

STANDARD PACKAGE E4-E8 — 10 each  
E10-E12 — 5 each



List No. 4160



**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

**GRADE 370E = C5**  
For use in steel and steel alloys

### Style ER - Right Hand

TOOL NO.	SHANK SIZE			GRADE 883E	GRADE 370E
	W	H	L	EDP NO.	EDP NO.
ER-4	1/4	1/4	2	70801	70802
ER-5	5/16	5/16	2 1/4	70804	70805
ER-6	3/8	3/8	2 1/2	70807	70808
ER-8	1/2	1/2	3 1/2	70810	70811
ER-10	5/8	5/8	4	70813	70814
ER-12	3/4	3/4	4 1/2	70815	70816

### Style EL - Left Hand

TOOL NO.	SHANK SIZE			GRADE 883E	GRADE 370E
	W	H	L	EDP NO.	EDP NO.
EL-4	1/4	1/4	2	70853	70854
EL-5	5/16	5/16	2 1/4	70855	70856
EL-6	3/8	3/8	2 1/2	70857	70858
EL-8	1/2	1/2	3 1/2	70860	70861
EL-10	5/8	5/8	4	70863	70864
EL-12	3/4	3/4	4 1/2	70865	70866



# Styles CTR & CTL Cut-Off Tools

Premium Carbide Tipped

For bar stock cut-off applications

Style CTR - Right Hand

Style CTL - Left Hand

Outil rapporté à pointe au carbure

Buril con punta de carburo



**GRADE 883E = C2**  
For use in cast iron  
and non-ferrous  
materials

**GRADE 370E = C5**  
For use in steel  
and steel alloys

List No. 4190

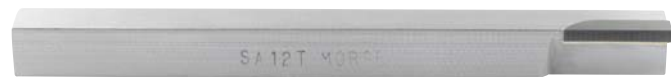
TOOL NO.	INDUSTRY NO.	W	SHANK SIZE			STD PKG. QTY.	TIP WIDTH	GRADE 883E	GRADE 370E
			H	L	EDP NO.			EDP NO.	
CTR-11	CTR-111	1/2	1	5	5	1/8	71101	71102	
CTR-22	CTR-122	1/2	1	5	5	3/16	71104	71105	
CTR-33	CTR-121	1/2	1	5	5	1/4	71107	71108	
CTR-44	CTR-120	1/2	1	5	5	5/16	71110	71111	
CTR-55	CTR-130	5/8	1 1/4	5	2	3/8	71113	71114	
CTL-11	CTL-111	1/2	1	5	5	1/8	71151	71152	
CTL-22	CTL-122	1/2	1	5	5	3/16	71154	71155	
CTL-33	CTL-121	1/2	1	5	5	1/4	71157	71158	
CTL-44	CTL-120	1/2	1	5	5	5/16	71160	71161	
CTL-55	CTL-130	5/8	1 1/4	5	2	3/8	71163	71164	

# Types T & C S.A. Series Swiss Automatic Tools

Carbide Tipped  
Grade C2 Carbide  
Left Hand

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4100 — Type T  
For Turning

**Grade C2**  
For use in cast iron  
and non-ferrous  
materials.



List No. 4100 — Type C  
For Cut-Off and Forming

SQ.	SHANK SIZE		STD. PKG. QTY.	TYPE T				TYPE C				
	LENGTH			TOOL NO.	CARBIDE SIZE			EDP NO.	TOOL NO.	CARBIDE SIZE		
				T	W	L		T	W	L		
1/4	6	10	SA6T	3/32	1/8	1 1/4	70001	SA6C	1/8	3/32	1 1/4	70021
3/32	6	10	SA7T	3/32	1/8	1 1/4	70002	SA7C	1/8	3/32	1 1/4	70022
5/16	6	10	SA8T	3/32	3/16	1 1/4	70003	SA8C	1/8	3/32	1 1/4	70023
3/8	6	10	SA9T	3/32	3/16	1 1/4	70004	SA9C	1/8	3/32	1 1/4	70024
13/32	6	10	SA10T	3/32	3/16	1 1/4	70005	SA10C	1/8	3/32	1 1/4	70025
7/16	6	10	SA11T	1/8	1/4	1	70006	SA11C	3/32	1/8	1 1/4	70026
15/32	6	10	SA11.5T	1/8	1/4	1	70007	SA11.5C	3/32	1/8	1 1/4	70027
1/2	6	10	SA12T	1/8	1/4	1	70008	SA12C	3/32	1/8	1 1/4	70028

# Types TSA, TSC & TSE Square Shank Boring Tools

Premium Carbide Tipped

STANDARD PACKAGE 10 each

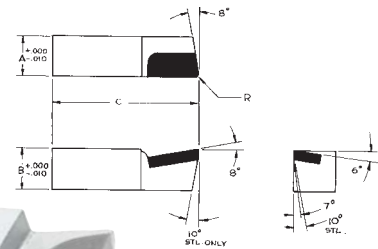
TOOL NO.	SHANK SIZE			NOSE RAD.	GRADE 883E	GRADE 370E
	W	H	L		EDP NO.	EDP NO.
TSA-5	5/16	5/16	1 1/2	1/64	<b>72081</b>	<b>72082</b>
TSA-6	3/8	3/8	1 3/4	1/64	<b>72085</b>	<b>72086</b>
TSA-8	1/2	1/2	2 1/2	1/32	<b>72089</b>	<b>72090</b>
TSC-5	5/16	5/16	1 1/2	1/64	<b>72101</b>	<b>72102</b>
TSC-6	3/8	3/8	1 3/4	1/64	<b>72105</b>	<b>72106</b>
TSC-8	1/2	1/2	2 1/2	1/32	<b>72109</b>	<b>72110</b>
TSE-5	5/16	5/16	1 1/2	1/64	<b>72121</b>	<b>72122</b>
TSE-6	3/8	3/8	1 3/4	1/64	<b>72125</b>	<b>72126</b>
TSE-8	1/2	1/2	2 1/2	1/32	<b>72129</b>	<b>72130</b>

Outil rapporté à pointe au carbure

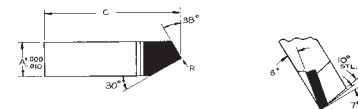
Buril con punta de carburo

**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

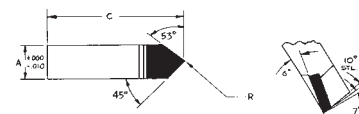
**GRADE 370E = C5**  
For use in steel and steel alloys



List No. 4200 — Type TSA



List No. 4200 — Type TSC



List No. 4200 — Type TSE

Outil rapporté à pointe au carbure

Buril con punta de carburo

# Types TRG, TRC & TRE Round Shank Boring Tools

Premium Carbide Tipped

**GRADE 883E = C2**  
For use in cast iron and non-ferrous materials

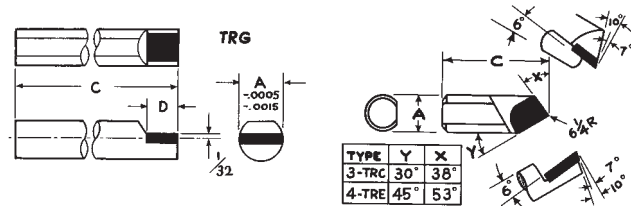
**GRADE 370E = C5**  
For use in steel and steel alloys



List No. 4200  
Type TRG



List No. 4200  
Types TRC & TRE



TOOL NO.	SHANK SIZE			STD. PKG. QTY.	GRADE 883E	GRADE 370E
	A DIA.	C LENGTH	D TIP		EDP NO.	EDP NO.
TRG-5	5/16	1 1/2	7/32	10	<b>72001</b>	<b>72002</b>
TRG-6	3/8	1 3/4	1/4	10	<b>72004</b>	<b>72005</b>
TRG-8	1/2	2 1/2	1 1/32	10	<b>72007</b>	<b>72008</b>

TOOL NO.	SHANK SIZE			STD. PKG. QTY.	GRADE 883E	GRADE 370E
	A DIA.	C LENGTH	D TIP		EDP NO.	EDP NO.
TRC-5	.312	1 1/2		10	<b>72041</b>	<b>72042</b>
TRC-6	.3745	1 3/4		10	<b>72045</b>	<b>72046</b>
TRC-8	.4995	2 1/2		10	<b>72049</b>	<b>72050</b>
TRE-5	.312	1 1/2		10	<b>72061</b>	<b>72062</b>
TRE-6	.3745	1 3/4		10	<b>72065</b>	<b>72066</b>
TRE-8	.4995	2 1/2		10	<b>72069</b>	<b>72070</b>

# Standard Grade Carbide Tipped Tool Bits

## Styles AR & AL 0° Lead Angle Turning Tools

Carbide Tipped

For turning to a square shoulder

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4111

<b>Grade C2</b> For use in cast iron and non-ferrous materials
<b>Grade C5</b> For roughing cuts in steel and steel alloys
<b>Grade C6</b> For general purpose use in steel and steel alloys

### Style AR - Right Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
AR4	10	73102	73103	73104
AR5	10	73107	73108	73109
AR6	10	73112	73113	73114
AR7	10	73117	73118	73119
AR8	10	73122	73123	73124
AR10	10	73127	73128	73129
AR12	5	73130	73131	73132
AR16	1	73133	73134	73135
AR20	1	73136*	73137*	73138*

### Style AL - Left Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
AL4	10	73202	73203	73204
AL5	10	73207	73208	73209
AL6	10	73212	73213	73214
AL7	10	73217	73218	73219
AL8	10	73222	73223	73224
AL10	10	73227	73228	73229
AL12	5	73230	73231	73232
AL16	1	73233	73234	73235
AL20	1	73236*	73237*	73238*

\*Available While Supplies Last

## Styles BR & BL 15° Lead Angle Turning Tools

Carbide Tipped

For turning when a square shoulder is not required and for interrupted cuts.

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4121

<b>Grade C2</b> For use in cast iron and non-ferrous materials
<b>Grade C5</b> For roughing cuts in steel and steel alloys
<b>Grade C6</b> For general purpose use in steel and steel alloys

### Style BR - Right Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
BR4	10	73302	73303	73304
BR5	10	73307	73308	73309
BR6	10	73312	73313	73314
BR7	10	73317	73318	73319
BR8	10	73322	73323	73324
BR10	10	73327	73328	73329
BR12	5	73330	73331	73332
BR16	1	73333	73334	73335
BR20	1	73336*	73337*	73338*

### Style BL - Left Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
BL4	10	73402	73403	73404
BL5	10	73407	73408	73409
BL6	10	73412	73413	73414
BL7	10	73417	73418	73419
BL8	10	73422	73423	73424
BL10	10	73427	73428	73429
BL12	5	73430	73431	73432
BL16	1	73433	73434	73435
BL20	1	73436*	73437*	73438*

\*Available While Supplies Last

See Premium Grade Series For Complete Dimensions.

# Standard Grade Carbide Tipped Tool Bits

## Style C Square Nose Tools

Carbide Tipped

For chamfering, facing, turning and for making special tool forms

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4131

<b>Grade C2</b> For use in cast iron and non-ferrous materials
<b>Grade C5</b> For roughing cuts in steel and steel alloys
<b>Grade C6</b> For general purpose use in steel and steel alloys

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
C4	10	73502	73503	73504
C5	10	73507	73508	73509
C6	10	73512	73513	73514
C7	10	73517	73518	73519
C8	10	73522	73523	73524

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
C10	10	73527	73528	73529
C12	5	73531	73532	73533
C16	1	73534	73535	73536
C44	1	—	73538*	73539*

\* Available while supplies last

## Style D 80° Included Angle Tools

Carbide Tipped

For under cutting and for ID and OD chamfering

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4141

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
D4	10	73602	73603	73604
D5	10	73607	73608	73609
D6	10	73612	73613	73614
D7	10	73617	73618	73619

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
D8	10	73622	73623	73624
D10	10	73626	73627	73628
D12	5	73629	73630	73631
D16	1	73632	73633	73634

## Style E 60° Included Angle Threading Tools

Carbide Tipped

For standard 60° threading, boring, V-grooving and other applications

Outil rapporté à pointe au carbure

Buril con punta de carburo



List No. 4151

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
E4	10	73702	73703	73704
E5	10	73707	73708	73709
E6	10	73712	73713	73714

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
E8	10	73717	73718	73719
E10	10	73722	73723	73724
E12	10	73725	73726	73727

See Premium Grade Series For Complete Dimensions.

# Standard Grade Carbide Tipped Tool Bits

## Styles FR & FL End Cutting Offset Tools

Outil rapporté à pointe au carbure

Buril con punta de carburo

Carbide Tipped

Offset for facing to a square shoulder



List No. 4171

<b>Grade C2</b> For use in cast iron and non-ferrous materials
<b>Grade C5</b> For roughing cuts in steel and steel alloys
<b>Grade C6</b> For general purpose use in steel and steel alloys

### Style FR – Right Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
FR10	5	—	73908*	73909*
FR12	5	—	73913*	73914*
FR16	1	73917*	73918*	—

### Style FL – Left Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE	GRADE
		C2	C5	C6
FL8	5	73952*	—	—
FL10	5	73957*	73958*	73959*
FL12	5	—	73963*	73964*
FL16	1	73967*	73968*	73969*

\*Available While Supplies Last

## Styles CTR & CTL Cut-Off Tools

Outil rapporté à pointe au carbure

Buril con punta de carburo

Carbide Tipped

For bar stock cut-off applications



List No. 4191

### Style CTR – Right Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE
		C2	C5
CTR11	5	74102	74103
CTR22	5	74107	74108
CTR33	5	74112	74113
CTR55	2	74116	74117

### Style CTL – Left Hand

TOOL NO.	STD. PKG. QTY	GRADE	GRADE
		C2	C5
CTL11	5	74152	74153
CTL22	5	74157	74158
CTL33	5	74162	74163
CTL44	5	74164*	—
CTL55	2	74166	74167

\*Available While Supplies Last

See Premium Grade Series For Complete Dimensions.

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

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## TOOL COATING SERVICE

**Tool Coatings** enhance cutting tool performance for increased productivity and lower overall tooling cost. Benefits include increased surface hardness, lubricity & heat resistance and decreased chemical reactivity. Results include reduced friction & torque, higher speeds & feeds, increased tool life, decreased galling & chip welding and improved surface finish. **PLEASE INQUIRE.**

**TiN** — Titanium Nitride

**TiCN** — Titanium Carbonitride

**TiAlN** — Titanium Aluminum Nitride

**AlTiN** — Aluminum Titanium Nitride

**CrN** — Chromium Nitride

**CrC** — Chromium Carbide

**DLC** — Diamond Like Carbon

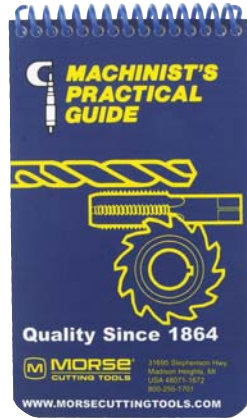
# Technical Publications

Guide technique

Guía técnica

## Machinist's Practical Guide

The original concept of a pocket size manual covering a wide range of practical information for the machinist, tool maker, engineer and student. End mills, cutters, drills, reamers, taps and tool bits are some of the cutting tool areas covered. Tool steels, tapers, speeds, feeds, cutting fluids, and a wealth of additional useful information is found in this complete 108-page handbook. Fits handily into shop coats, tool boxes, desk drawers, etc.



## Machinist's Guide for Taps

Taps and screw threads play a very important part in "holding the world together by a thread." This booklet contains all the needed information for correct tapping work. Included are thread forms and dimensions, fits and limits, hole preparation and size, type of taps, speeds and lubricants, tap sharpening and troubleshooting hints.



## Machinist's Guide for Carbide Tooling

Carbide and its many applications is fully explained in this handy booklet. Complete coverage is given from the introduction and manufacture of carbide to its present major position in the cutting tools field. Included are design, application, geometrics, troubleshooting, speeds and feeds.



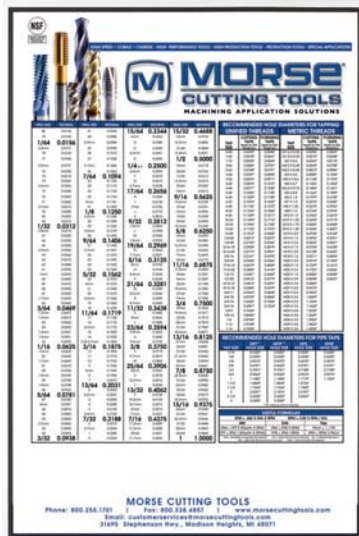
Miscellaneous

GUIDES	LIST NO.	DISPLAY BOX OF 50 (1 BOX) EDP NO.	INDIVIDUAL COPIES EDP NO.
Machinist's Practical Guide	1001	20401	20402
Machinist's Guide for Taps	1002	20403	20404
Machinist's Guide for Carbide Tooling	1004	20407	20408

## Morse® Plastic Wall Chart

Tableau mural

Tabla mural



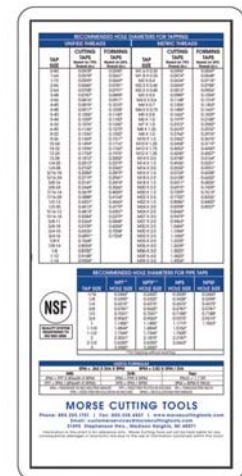
NEW LOOK! LARGER SIZE! Redesigned for enhanced readability. Decimal Equivalents, Tap Drill Sizes for inch, metric and pipe threads. 24" x 36" printed on heavy duty .023" gage plastic with three punched holes across top for wall mounting. Also available Custom Imprinted with your company logo and information.

List No. 1007 EDP No. 01650

## Decimal Equivalent Pocket Chart List No. 1005

Tableau décimal

Tabla de medidas decimales



Front

Back

NEW LOOK! LARGER SIZE! Decimal Equivalents. Tap Drill Sizes for inch, metric and pipe threads. Size: 3 3/8" x 7". Printed on plastic

Pack of 50  
EDP No. 20412

Pack of 100  
EDP No. 20413

# Screw Extractors

For removing broken bolts, screws or studs without damage to the threaded hole.

Furnished with a left-hand spiral. Carbon steel.

Extracteur à vis

Extractor de tornillos



**STANDARD PACKAGE** Sizes 1 thru 3 — 12 each  
 Sizes 4 & 5 — 6 each  
 Sizes 6 and over — 1 each

**List No. 0773**

SCREW EXTRACTOR NUMBER	DIAMETER		OAL	DRILL SIZE TO USE	FOR EXTRACTING		EDP. NO.
	SMALL END	LARGE END			BOLT AND SCREW SIZE	STANDARD PIPE SIZE	
1	1/16	1/8	2	5/64	3/16 - 1/4		20201
2	3/32	19/64	2 3/8	7/64	1/4 - 5/16		20202
3	1/8	1/4	2 11/16	5/32	5/16 - 7/16		20203
4	3/16	11/32	3	1/4	7/16 - 9/16		20204
5	1/4	7/16	3 3/8	17/64	9/16 - 3/4	1/8 - 1/4	20205
6	3/8	19/32	3 3/4	13/32	3/4 - 1	3/8	20206
7	1/2	25/32	4 1/8	17/32	1 - 1 3/8	1/2	20207
8	3/4	1 1/32	4 3/8	13/16	1 3/8 - 1 3/4	3/4	20208
9	1	1 9/32	4 5/8	1 1/16	1 3/4 - 2 1/8	1	20209
10	1 1/4	1 9/16	5	1 5/16	2 1/8 - 2 1/2	1 1/4	20210
11	1 1/2	1 7/8	5 5/8	1 9/16	2 1/2 - 3	1 1/2	20211
12	1 7/8	2 5/16	6 1/4	1 15/16	3 - 3 1/2	2	20212

## Screw Extractor Sets

Jeu d'extracteurs à vis

Juego de extractores de tornillos

For removing broken bolts, screws or studs without damage to the threaded hole.

Furnished with a left-hand spiral. Carbon steel.

EDP NO. 20217		EDP NO. 20218	
SET NO. 62		SET NO. 68	
EXTRACTOR NUMBER	SIZE RANGE	EXTRACTOR NUMBER	SIZE RANGE
1	3/16 to 1/4	6	3/4 to 1
2	1/4 to 5/16	7	1 to 1 3/8
3	5/16 to 7/16	8	1 3/8 to 1 3/4
4	7/16 to 9/16	9	1 3/4 to 2 1/8
5	9/16 to 3/4		

In Plastic Pouch      In Vinyl Pouch



List No. 7300

## Combination Screw Extractor and Drill Set

Jeu d'extracteurs à vis

Juego de extractores de tornillos

In Metal Case – Screw Machine Length Drills

SET NO. 64		
EXTRACTOR NUMBER	DRILL SIZE	EDP NO.
1	5/64	20219
2	7/64	
3	5/32	
4	1/4	
5	17/64	



List No. 7301



# Morse Taper Drill Sleeves

For adapting Morse Taper shank tools to machine spindles having larger Morse Taper holes.

Regularly furnished soft with accurately finished Morse taper hole and shank.

**STANDARD PACKAGE** All sizes — 1 each



List No. 0202 Carbon Steel

Porte-foret

Manguito para broca

SIZE	MORSE TAPER		OAL	EDP NO.
	HOLE	SHANK		
1 to 2	1	2	3 <sup>9</sup> / <sub>16</sub>	20031
1 to 3	1	3	3 <sup>15</sup> / <sub>16</sub>	20032
1 to 4	1	4	4 <sup>7</sup> / <sub>8</sub>	20033
1 to 5	1	5	6 <sup>1</sup> / <sub>8</sub>	20034
2 to 3	2	3	4 <sup>7</sup> / <sub>16</sub>	20035
2 to 4	2	4	4 <sup>7</sup> / <sub>8</sub>	20036
2 to 5	2	5	6 <sup>1</sup> / <sub>8</sub>	20037
3 to 4	3	4	5 <sup>3</sup> / <sub>8</sub>	20038
3 to 5	3	5	6 <sup>1</sup> / <sub>8</sub>	20039
4 to 5	4	5	6 <sup>5</sup> / <sub>8</sub>	20040
4 to 6	4	6	8 <sup>5</sup> / <sub>8</sub>	20041
5 to 6	5	6	8 <sup>5</sup> / <sub>8</sub>	20042

# Morse Taper Extension Sockets

Use as either an extension socket or to adapt a Morse Taper shank tool to a machine spindle whose Morse Taper hole is smaller than the shank of the tool.

Regularly furnished soft with accurately finished Morse Taper hole and shank.

**STANDARD PACKAGE** All sizes — 1 each



List No. 0201 Carbon Steel

Douille de raccord

Casquillo de extensión

SIZE	MORSE TAPER		OAL	EDP NO.
	HOLE	SHANK		
1 to 2	1	2	6 <sup>3</sup> / <sub>16</sub>	20011
1 to 3	1	3	6 <sup>15</sup> / <sub>16</sub>	20012
2 to 2	2	2	6 <sup>13</sup> / <sub>16</sub>	20014
2 to 3	2	3	7 <sup>9</sup> / <sub>16</sub>	20015
2 to 4	2	4	8 <sup>9</sup> / <sub>16</sub>	20016
3 to 2	3	2	7 <sup>3</sup> / <sub>4</sub>	20017
3 to 3	3	3	8 <sup>1</sup> / <sub>2</sub>	20018
3 to 4	3	4	8 <sup>1</sup> / <sub>2</sub>	20019
3 to 5	3	5	10 <sup>3</sup> / <sub>4</sub>	20020
4 to 3	4	3	9 <sup>7</sup> / <sub>16</sub>	20021
4 to 4	4	4	10 <sup>7</sup> / <sub>16</sub>	20022
4 to 5	4	5	11 <sup>11</sup> / <sub>16</sub>	20023
5 to 4	5	4	11 <sup>13</sup> / <sub>16</sub>	20024
5 to 5	5	5	13 <sup>1</sup> / <sub>16</sub>	20025
5 to 6	5	6	15 <sup>3</sup> / <sub>8</sub>	20026*

\* Available While Supplies Last

# Drill Drifts

For removal of sleeves, sockets, or taper shank cutting tools from spindles or tool holders.

Size #1 for removal of #1 Morse Taper Tools

Size #2 for removal of #2 Morse Taper Tools

Size #3 for removal of #3 Morse Taper Tools

Size #4 for Tools #4 Morse Taper and larger Tools



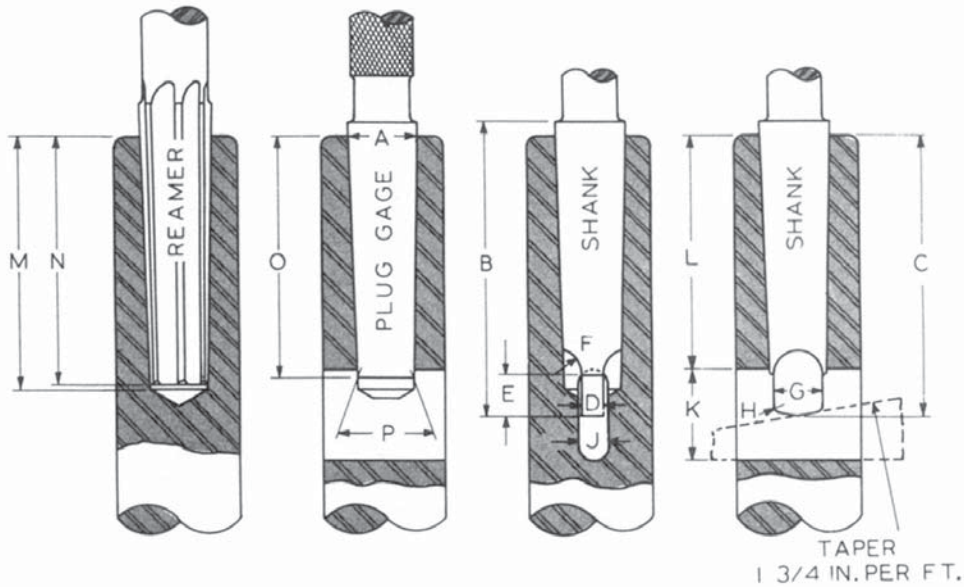
List No. 0210

**STANDARD PACKAGE**

All sizes — 1 each

SIZE	EDP NO.
1	20051
2	20052
3	20053
4	20054

# Morse Taper Dimensions



NUMBER OF TAPER	DIA. OF PLUG AT SMALL END	DIA. AT END OF SOCKET	SHANK		DEPTH OF DRILLED HOLE	DEPTH OF REAMED HOLE	STANDARD PLUG DEPTH	TANG			TANG SLOT			END OF SOCKET TO TANG SLOT	TAPER PER INCH	TAPER PER FOOT	
			ENTIRE LENGTH	DEPTH				THICKNESS	LENGTH	RADIUS	DIAMETER	RADIUS	WIDTH				LENGTH
	P	A	B	C	M	N	O	D	E	F	G	H	J	K	L		
0	.25200	.35610	2 <sup>11</sup> / <sub>32</sub>	2 <sup>7</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>32</sub>	2	0.156	1/4	5/32	1 <sup>5</sup> / <sub>64</sub>	3/64	0.172	9/16	1 <sup>15</sup> / <sub>16</sub>	.052050	.62460
1	.36900	.47500	2 <sup>9</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>32</sub>	2 <sup>1</sup> / <sub>8</sub>	.203	3/8	3/16	1 <sup>1</sup> / <sub>32</sub>	3/64	0.218	3/4	2 <sup>1</sup> / <sub>16</sub>	.049882	.59858
2	.57200	.70000	3 <sup>1</sup> / <sub>8</sub>	2 <sup>15</sup> / <sub>16</sub>	2 <sup>21</sup> / <sub>32</sub>	2 <sup>39</sup> / <sub>64</sub>	2 <sup>9</sup> / <sub>16</sub>	0.250	7/16	1/4	1 <sup>7</sup> / <sub>32</sub>	1/16	0.266	7/8	2 <sup>1</sup> / <sub>2</sub>	.049951	.59941
3	.77800	.93800	3 <sup>7</sup> / <sub>8</sub>	3 <sup>11</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>16</sub>	0.312	9/16	9/32	2 <sup>3</sup> / <sub>32</sub>	5/64	0.328	1 <sup>3</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	.050195	.60235
4	1.02000	1.23100	4 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>16</sub>	0.469	5/8	5/16	3 <sup>1</sup> / <sub>32</sub>	3/32	0.484	1 <sup>1</sup> / <sub>4</sub>	3 <sup>7</sup> / <sub>8</sub>	.051938	.62326
4 <sup>1</sup> / <sub>2</sub>	1.26600	1.50000	5 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	4 <sup>9</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	0.562	1 <sup>1</sup> / <sub>16</sub>	3/8	1 <sup>13</sup> / <sub>64</sub>	1/8	0.578	1 <sup>3</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>16</sub>	.052000	.62400
5	1.47500	1.74800	6 <sup>1</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>16</sub>	0.625	3/4	3/8	1 <sup>13</sup> / <sub>32</sub>	1/8	0.656	1 <sup>1</sup> / <sub>2</sub>	4 <sup>15</sup> / <sub>16</sub>	.052626	.63151
6	2.11600	2.49400	8 <sup>9</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>4</sub>	7 <sup>13</sup> / <sub>32</sub>	7 <sup>21</sup> / <sub>64</sub>	7 <sup>1</sup> / <sub>4</sub>	0.750	1 <sup>1</sup> / <sub>8</sub>	1/2	2	5/32	0.781	1 <sup>3</sup> / <sub>4</sub>	7	.052138	.62565
7	2.75000	3.27000	11 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	10 <sup>5</sup> / <sub>32</sub>	10 <sup>5</sup> / <sub>64</sub>	10	1.125	1 <sup>3</sup> / <sub>8</sub>	3/4	2 <sup>5</sup> / <sub>8</sub>	3/16	1.156	2 <sup>5</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>2</sub>	.052000	.62400

The undercut shown on the tang having diameter G, and length E, may be eliminated at the option of the manufacturer provided the tang is heat-treated to a minimum Rockwell of C30 with 150Kg load.

TOLERANCES ON RATE OF TAPER, all sizes 0.0002 per foot. This tolerance may be applied on shanks only in the direction which increases the rate of taper and on sockets only in the direction which decreases the rate of taper.

## CUTTING FLUIDS

Coolants and lubricants offer many benefits including reduced friction and heat, enhanced chip removal, improved accuracy and surface finish, higher speeds and feeds, corrosion protection and increased tool life.

Proper selection and application of cutting fluids is critical to optimizing machining applications. **Please consult your cutting fluids supplier for advice on your specific machining application.**

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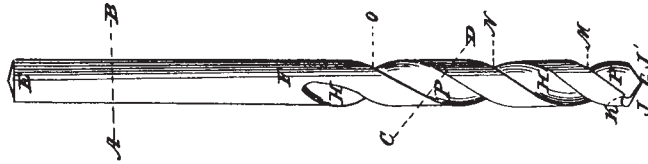
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# A H I S T O R Y

Morse Cutting Tools began with the ideas of one man. From his ideas a company grew to become the leader in the design and manufacture of metal cutting tools. A firm's history plays an important role in shaping its present operation. This brief history outlines Morse's growth from the early 1800s to the present.



Stephen A. Morse, an enterprising mechanic, developed a new and better way to drill a hole when he invented the twist drill. With a new patent and a stockholder investment of \$30,000, he opened the Morse Twist Drill and Machine Company in New Bedford, Massachusetts in 1864.

Recognizing the need for a way to drive his twist drill, Morse created the taper shank series. Two sets of master gages were made up; one, sent to the Bureau of Standards in Washington, D.C., was accepted as a National Standard. The other remains with the Morse company. Differences with his board caused Morse to resign from the company in 1868.

Philadelphia's 1877 Centennial Exhibition showcased the first exhibition of Morse tools. Morse products gained an international reputation for quality and were sold throughout the United States and in England, Russia, and Germany.

In the latter part of the nineteenth century, the company began a pattern of acquisition which resulted in enormous growth. Morse took over the Manhattan Fire Arms Company of Newark, New Jersey and the American Standard Tool Company of Danbury, Connecticut. Morse also acquired the Beach chuck patent of the Meridan Tool Company, Meridan, Connecticut, and the Schofield Patent Grinding Line, helping to insure accuracy in drill grinding.



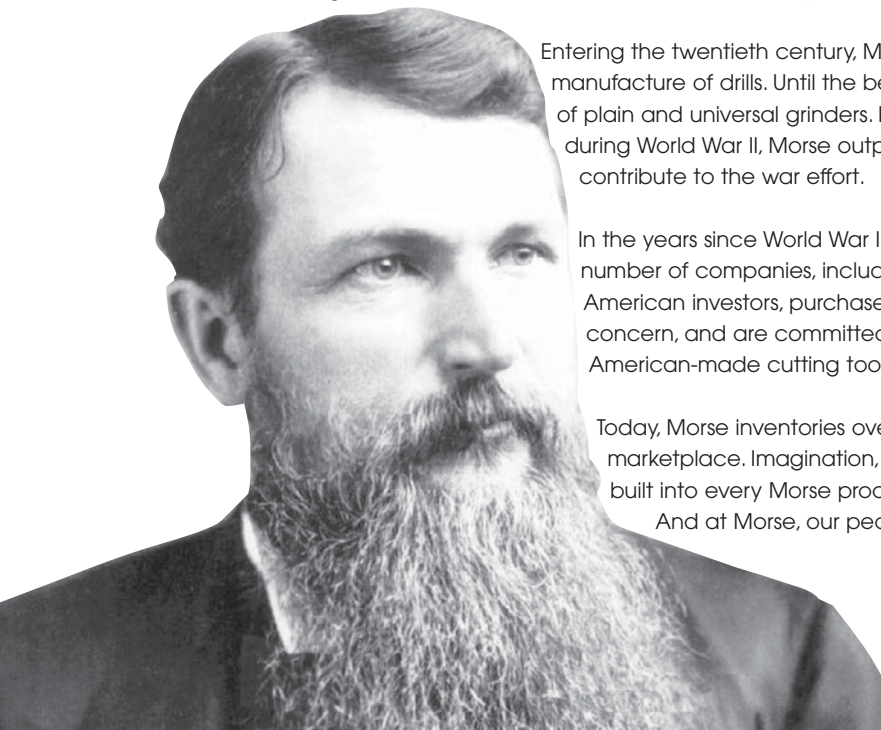
In 1874, Morse purchased the machinery, patents and stock of the New York Tap and Die Company of Bridgeport, Connecticut. In 1897, Morse purchased the T&B Tool Company. T&B's machines, used in the manufacture of constant angle twist drills, were designed by a former Morse employee who had gone into business for himself and were built by Pratt and Whitney.

Entering the twentieth century, Morse developed a grinding machine used in the manufacture of drills. Until the beginning of World War I, the company marketed a line of plain and universal grinders. Business continued to grow between the wars, and during World War II, Morse output increased four to five times normal production to contribute to the war effort.

In the years since World War II, Morse has operated under the ownership of a number of companies, including Gulf+Western. The current owners, a group of American investors, purchased the company from a Scottish manufacturing concern, and are committed to upholding the Morse reputation for high quality, American-made cutting tools.

Today, Morse inventories over 10,000 varieties of cutting tools to serve our nation's marketplace. Imagination, technological innovation and insistence on quality are built into every Morse product.

And at Morse, our people wouldn't have it any other way!



## TERMS OF SALE

These are the terms of sale between Morse Cutting Tools ("Seller") and the entity that is purchasing goods from Seller ("Buyer"). "Buyer" agrees that these terms of sale are applicable to the transactions between "Buyer" and "Seller", and agrees to contract with "Seller" pursuant to these terms.

### ACCEPTANCE OF TERMS OF SALE

No conditions stated by "Buyer" in its offer or acceptance shall be binding on "Seller" if in conflict with, inconsistent with, or in addition to, "Seller" terms. Credit is conditional upon determination by "Seller" each time an order is received. By use of our website you agree to our Legal and Privacy Policies. You certify, represent, and warrant that all purchases made by employees/agents of your organization utilizing your Morse Cutting Tools account number are authorized purchases of your organization. You acknowledge and agree that it is your responsibility to verify and maintain the protection, security, and distribution of your account number, user names, and passwords associated with purchasing via Morse Cutting Tools and morsecuttingtools.com. Furthermore, you expressly agree that all liability relating to password management resides with you and your organization and that under no circumstances, including negligence or misconduct, shall Morse Cutting Tools be liable for any damages that result from the use of our website. You acknowledge that your purchasing rights and privileges may be modified at any time upon notice from Morse Cutting Tools. Orders are accepted on the basis of terms of sale in effect at the time the order is received and approved by the "Seller" at "Seller's" Main Offices. Acceptance of any products delivered hereunder by "Seller" or any of its Affiliates or Assignees shall constitute "Buyer's" agreement to said Terms of Sale as set forth herein or found on our website.

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If merchandise is not in stock, it will be placed on backorder for 90 days. Unless we have customer authorization to hold merchandise on backorder longer than 90 days, it will automatically be cancelled and you will be notified.

### CLAIMS

All claims MUST be made within 5 days of receipt. To expedite service please refer to our shipper or invoice number. Damages incurred in commercial shipments must be claimed through the common carrier.

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Unless otherwise agreed to in writing, upon approved credit, standard terms of payment shall be 1%15 Net 30 Days. A 1-1/2% monthly service charge may be added on invoices not paid when due. Returned checks and electronic payments are subject to \$15.00 charge. If "Buyer" fails to fulfill these terms or if "Seller" at any time has any doubt as to "Buyer's" financial responsibility, "Seller" may demand immediate full payment and decline to make further deliveries. Any indebtedness owing from "Buyer" to "Seller" can be set off and applied by "Seller" and associated companies on any indebtedness at any time from time to time either before or after maturity or demand. "Buyer"/applicant agrees to pay any collection cost incurred to collect delinquent amounts, including attorney's fees.

### CREDIT BALANCE

"Buyer" agrees that any credit balance issued will be applied within one (1) year of its issuance. If not applied or requested within one (1) year, any credit balance remaining will be subject to cancellation, and "Seller" shall have no further liability.

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**UPS:** Notify your local UPS office immediately. Advise us so we can reship the merchandise and place a claim. Keep damaged goods and containers for UPS inspection.

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**USA:** Internet stock orders accepted by 6:00pm EST will ship same day and are eligible for UPS Next Day Delivery (UPS Red) at 50% off the base rate and we pay the fuel surcharge.\* All orders over \$500 are eligible for free UPS ground\*. All other orders will ship at the selected UPS service and billed at the published rate. We shall not be liable for any injury, loss, damage, or delay in delivery resulting from the handling or use of the goods after or during such delivery.\*Applicable only in the Continental USA. Alaska, Hawaii, US territories and other areas are not eligible for either program.

**CANADA:** Shipments into Canada are freight free. All orders are duty paid, customs cleared, and shipped pre-paid via Purolator. All small packages are shipped via Purolator, with service based on Toronto origin. Large shipments over 150 lbs. are subject to LTL standards. No reference is made to Morse Cutting Tools on the packing slip or shipping label on drop shipments to your customer. In stock orders accepted by 4:00 pm EST will ship same day. Other restrictions may apply. We reserve the right to select other carriers as necessary. We shall not be liable for any injury, loss, damage, or delay in delivery resulting from the handling or use of the goods after or during such delivery.

### DISCLAIMER OF WARRANTIES

Morse Cutting Tools warrants to original equipment manufacturers, distributors and industrial and commercial use of its products that each new product which it manufactures or supplies is free from defects in material and workmanship. Its sole obligation under this warranty is limited to furnishing, without additional charge, a replacement, for, or, at its options, repairing or issuing credit for any such product which shall, within one year from the date of sale by Morse Cutting Tools, be returned freight prepaid to the facility designated by a Morse Cutting Tools representative and which, upon inspection, is determined by Morse Cutting Tools to be defective in materials or workmanship. The provisions of this warranty shall not apply to any product which has been subjected to misuse, improper operating conditions, machine setup or which has been repaired or altered, if such would adversely affect performance of the product. Complete written information with respect to all such matters must be furnished to Morse Cutting Tools, as a prerequisite to its consideration of any claim or complaint under this warranty. The repair, replacement or issuance of credit for parts provided for in this warranty constitute the "Buyer's" EXCLUSIVE REMEDY.

**This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness for a particular**

### HANDLING CHARGES

**USA:** A \$5.00 handling charge will apply to all orders under \$50.00 net at distributor cost.

**Canada:** A \$5.00 handling charge will apply to all orders under \$100.00 net at distributor cost.

### INDEMNITY

The "Buyer" shall defend and indemnify "Seller", as a result of "Buyer's" negligence, from and against any and all loss of or damage to the merchandise, usual wear and tear excepted; any claim, cause of action, damages, liability, cost or expenses (including attorney's fees) which may arise or be incurred in any manner in favor of any person relating to the merchandise or any part of the merchandise, including by way of example but not of limitation, claims arising out of or incident to the construction, purchase, delivery, installation, ownership, leasing, sale, or return of the merchandise or as a result of its use, maintenance, repair, operation or condition thereof, whether or not any claimed defects in such merchandise are latent or are discoverable; and any claim, cause of action, cost, or expense arising for alleged patent infringement of, for, or as a result of claims for alleged strict liability in tort. The obligations of "Buyer" herein contained shall survive the expiration of the Agreement as to any loss, damages, claims, causes of action liabilities, costs, or expenses.

## TERMS OF SALE - (Continued)

### INSPECTIONS

Any inspection of goods agreed to by the parties will be made at "Seller's" location, Manufacturer's plant, or other source of supply and must be made before shipment. Any goods not rejected by "Buyer" before shipment will be deemed accepted.

### INVENTORY

We do our best to maintain in stock full and complete inventories of all regular lines. All merchandise subject to prior sale.

### LIMITATION OF DAMAGES

"SELLER'S" AGGREGATE LIABILITY FOR ANY AND ALL CLAIMS ARISING UNDER THESE TERMS OF SALE SHALL NOT EXCEED THE TOTAL AMOUNT PAID FOR THE SPECIFIC GOODS RELATED TO THE CLAIM AGAINST "SELLER."

### LIMITATION OF LIABILITY

IN NO EVENT SHALL "SELLER" BE LIABLE FOR LOSS OF PROFITS, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY BREACH OF THIS AGREEMENT OR OBLIGATIONS UNDER THIS AGREEMENT, NOR SHALL "SELLER" BE LIABLE FOR ANY DAMAGES CAUSED BY DELAY IN DELIVERY, INSTALLATION, OR FURNISHING OF THE MERCHANDISE OR SERVICES BY ANY MANUFACTURER OF THE MERCHANDISE OR OTHERWISE.

### NOTICE TO SUBSEQUENT PURCHASER OR REPACKER

For imported articles, the requirements of 19 U.S.C. 1304 and 19 CFR part 134 provide that the articles or their containers must be marked in a conspicuous place as legibly, indelibly, and permanently as the nature of the article or container will permit, to indicate to an ultimate purchaser in the United States the English name of the country of origin of the article.

### PRICES

**USA:** All prices are in US dollars. All prices are subject to change without notice. Typographical or similar errors are subject to correction.

**Canada:** All prices are in Canadian dollars. All prices are subject to change without notice. Typographical or similar errors are subject to correction.

### PROMOTIONAL AND ADVERTISING MATERIAL

"Buyer" authorizes "Seller", its affiliates or representatives, to send e-mails or faxes, of any kind, including but not limited to correspondence, promotional and advertising material, to "Buyer" or its affiliates.

### QUOTATIONS

Quotations are valid for 30 days.

### RESPONSIBILITY

The value of a defective product or material sent in error is our only liability. All technical data has been supplied by the manufacturer and is listed only as a convenience. All specifications are subject to change without notice. Photos shown in any of our advertising material, catalog and website are general representations of the various items and may include optional equipment. We do not warrant or represent that the merchandise complies with the provisions of any law, particularly including the Walsh-Healy Public Contracts Act and the Occupational Safety and Health Act of 1970, and regulations promulgated thereunder, unless the manufacturer so warrants.

### RETURNS

Customer must obtain a Returned Goods Authorization ("RGA") Number prior to returning goods. No merchandise will be accepted without an "RGA Number." Unless we have erred, returns must be prepaid and are subject to restocking charge. No merchandise will be accepted for return which is made up special, discontinued, or which has been held for over 30 days. We reserve the right to determine if the purchaser has abused the item in question. If it cannot be returned to stock, credit will not be given. **Returns not accompanied by a copy of shipper, invoice, or invoice number may not be accepted or subject to restocking charge. Returns due to customer error must be prepaid and are subject to restocking charge.** Any claims for discrepancies in shipment must be made within 5 days of receipt of merchandise. **Items that cannot be returned via UPS:** Call or e-mail customerservice@morsecuttingtools.com for instructions

### SAFETY

"Buyer" will cause each person who receives or uses purchased goods to read and comply with all safety instruction provided by "Seller" and Manufacturer, including all product safety notices, warnings, instructions and training materials, manuals, or other similar safety documentation. "Buyer" will instruct each user in the proper use of the goods and implement and enforce the safety documentation. "Buyer" will be solely responsible for complying with local, state and federal or provincial laws, codes or regulations relating to safety of the workplace where the goods are used. Cutting Tools may shatter when broken. The wearing of eye protection is strongly recommended in the vicinity of their use.

### SALES TAX / GST / HST

**USA:** "Seller" is required to charge state and local tax on items for which sales tax exemption certification have not been provided. When ordering, please indicate tax exemption and provide certification.

**Canada:** "Seller" is required to charge GST (goods and services tax) / HST (harmonized sales tax) on products shipped to Canada

### TITLE

To secure payment and performance of all "Buyer's" obligations hereunder, whether represented by commercial account or evidenced by notes, judgments or otherwise, "Seller" hereby retains title to the equipment and a security interest herein until payment in full and performance by "Buyer" of said obligations.

**TERMS OF SALE ARE SUBJECT TO CHANGE WITHOUT NOTICE. CURRENT TERMS AVAILABLE AT [WWW.MORSECUTTINGTOOLS.COM/cgi/TERMOFSALE](http://WWW.MORSECUTTINGTOOLS.COM/cgi/TERMOFSALE)**



# MORSE<sup>®</sup>

## CUTTING TOOLS



### *Certificate of Registration*

This certifies that the Quality Management System of

## **Morse Cutting Tools**

31695 Stephenson Hwy.  
Madison Heights, Michigan, 48071-1672, United States

has been assessed by NSF-ISR and found to be in conformance to the following standard(s):

### **ISO 9001:2008**

#### **Scope of Registration:**

The design of cutting tools and accessories including distribution services and sales thereof.



Certificate Number: 64541-IS3  
Certificate Issue Date: 07-MAY-2015  
Registration Date: 29-AUG-2015  
Expiration Date \*: 28-AUG-2018

  
Carl Blazik,  
Director, Technical  
Operations & Business Units,  
NSF-ISR, Ltd.

#### **NSF International Strategic Registrations**

789 North Dixboro Road, Ann Arbor, Michigan 48105 | (888) NSF-9000 | [www.nsf-isr.org](http://www.nsf-isr.org)

Authorized Registration and/or Accreditation Marks. This certificate is property of NSF-ISR and must be returned upon request.  
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