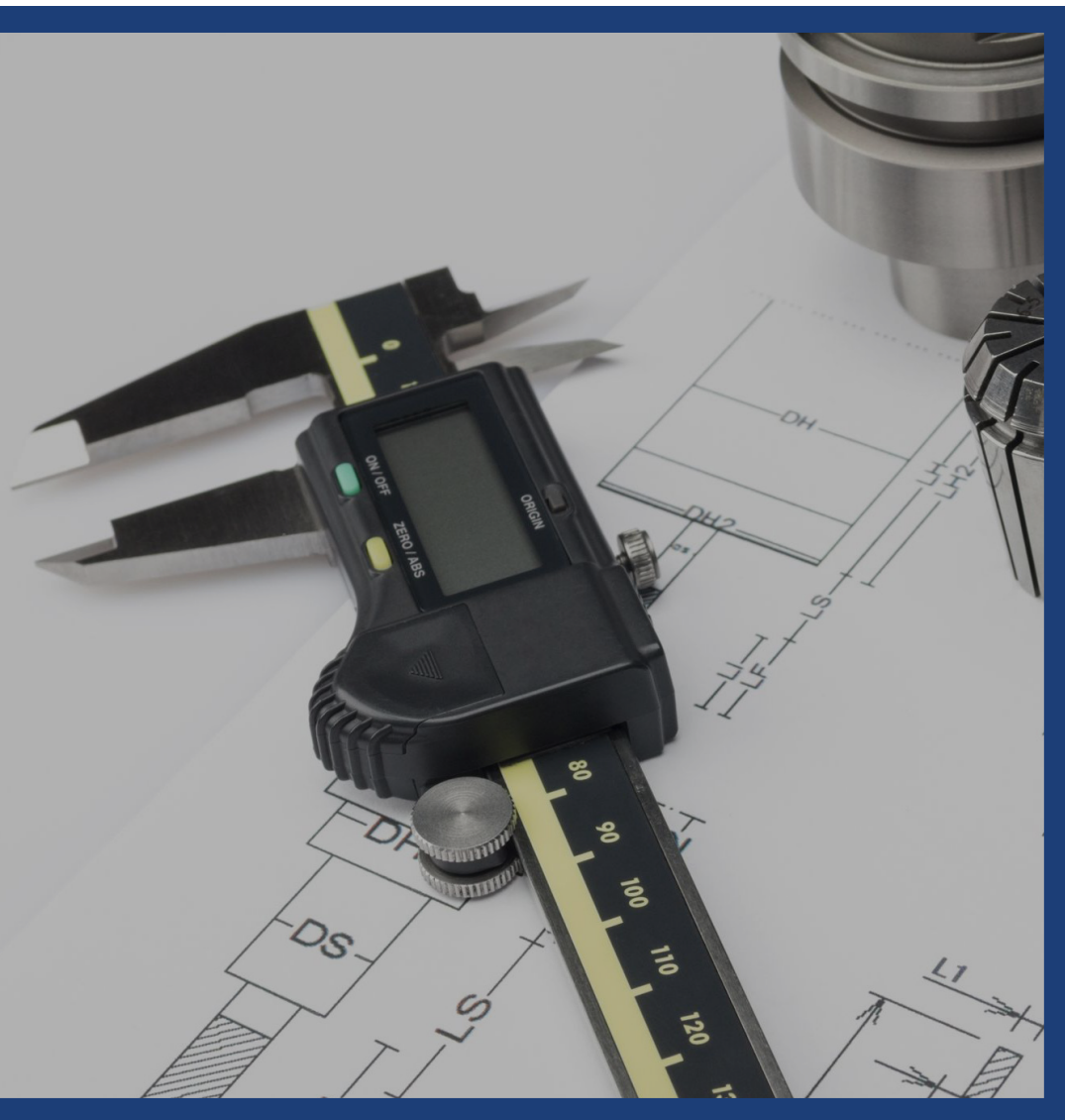




FEATURED SOLUTIONS

Metric Tooling

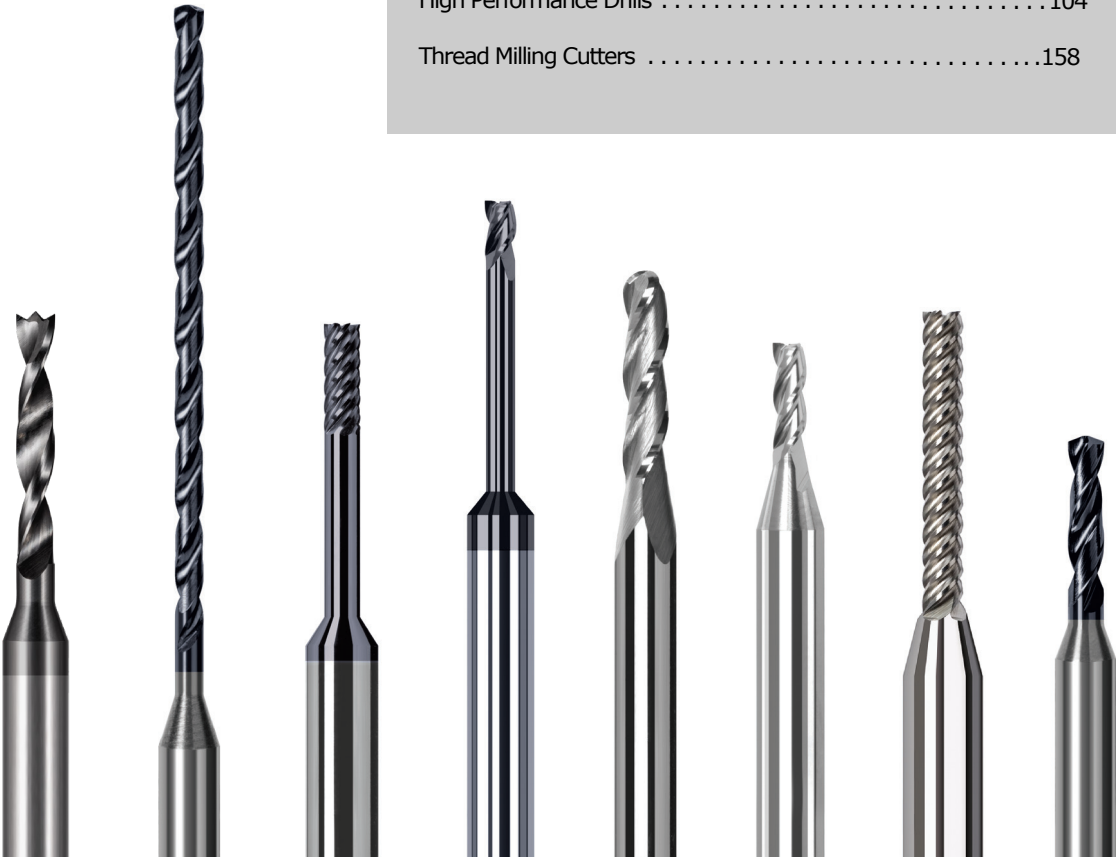


Metric Tooling

Our metric product offering includes **over 1,300 high performance end mills and drills** each with specialized geometry that will enhance tool results in a **variety of materials**. Featuring **tight tolerances** for ultra-precision micromachining and larger shank diameters for **increased rigidity**, these products will improve performance, decrease cycle times, and save you money.

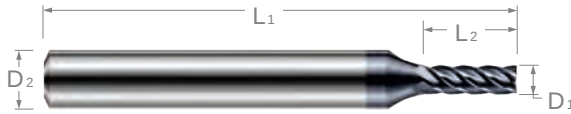
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END MILLS FOR HARDENED STEELS

Square – For Steels Up to 55 Rc



5 Flute, Variable
Helix Design

HARDENED STEELS

- Designed to mill hardened tool, die, and mold steels up to 55Rc
- Also excellent for stainless steel, inconel, titanium, and other high temperature alloys
- 5 flute, variable helix design (approx. 37°) for improved slotting and roughing
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- Increased shank diameter to maintain strength and stiffness
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER			LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D1			L2	D2 (h6)	L1	5 FL	PRICE
$+0.005"$ $-0.005"$	$+0.00$ -0.02 mm	decimal equivalent	$+0.010"$ $-0.000"$ $+0.25$ -0.00 mm				
.015 (1/64)		.0150	.023 (1.5x)	1/4	2-1/2	907415-C6	73.50
.015 (1/64)		.0150	.045 (3x)	1/4	2-1/2	915915-C6	73.50
.015 (1/64)		.0150	.078 (5x)	1/4	2-1/2	885215-C6	77.00
.020		.0200	.030 (1.5x)	1/4	2-1/2	907420-C6	73.50
.020		.0200	.060 (3x)	1/4	2-1/2	915920-C6	73.50
.020		.0200	.100 (5x)	1/4	2-1/2	885220-C6	77.00
.025		.0250	.038 (1.5x)	1/4	2-1/2	907425-C6	73.50
.025		.0250	.075 (3x)	1/4	2-1/2	915925-C6	73.50
.030		.0300	.045 (1.5x)	1/4	2-1/2	907430-C6	66.70
.030		.0300	.090 (3x)	1/4	2-1/2	915930-C6	66.70
.031 (1/32)		.0310	.025 (0.8x)	1/4	2-1/2	859431-C6	64.70
.031 (1/32)		.0310	.047 (1.5x)	1/4	2-1/2	907431-C6	61.90
.031 (1/32)		.0310	.093 (3x)	1/4	2-1/2	915931-C6	61.90
.031 (1/32)		.0310	.125 (4x)	1/4	2-1/2	824931-C6	64.70
.031 (1/32)		.0310	.156 (5x)	1/4	2-1/2	885231-C6	67.50
.035		.0350	.053 (1.5x)	1/4	2-1/2	907435-C6	62.20
.035		.0350	.105 (3x)	1/4	2-1/2	915935-C6	62.20
.039		.0390	.059 (1.5x)	1/4	2-1/2	907439-C6	62.20
.039		.0390	.117 (3x)	1/4	2-1/2	915939-C6	62.20
.039		.0390	.203 (5x)	1/4	2-1/2	885239-C6	67.50
1.0 mm		.0393	3.00 mm (3x)	6 mm	63 mm	897822-C6	68.10
.040		.0400	.060 (1.5x)	1/4	2-1/2	907440-C6	61.90
.040		.0400	.120 (3x)	1/4	2-1/2	915940-C6	61.90
.040		.0400	.203 (5x)	1/4	2-1/2	885240-C6	67.50
.045		.0450	.068 (1.5x)	1/4	2-1/2	907445-C6	62.20
.045		.0450	.135 (3x)	1/4	2-1/2	915945-C6	62.20
.047 (3/64)		.0470	.071 (1.5x)	1/4	2-1/2	907447-C6	61.90
.047 (3/64)		.0470	.141 (3x)	1/4	2-1/2	915947-C6	61.90
.047 (3/64)		.0470	.187 (4x)	1/4	2-1/2	824947-C6	64.70
.047 (3/64)		.0470	.250 (5x)	1/4	2-1/2	885247-C6	67.50
.050		.0500	.075 (1.5x)	1/4	2-1/2	907450-C6	61.90
.050		.0500	.150 (3x)	1/4	2-1/2	915950-C6	61.90
.055		.0550	.083 (1.5x)	1/4	2-1/2	907455-C6	62.20
.055		.0550	.165 (3x)	1/4	2-1/2	915955-C6	62.20
.060		.0600	.090 (1.5x)	1/4	2-1/2	907460-C6	61.90
.060		.0600	.180 (3x)	1/4	2-1/2	915960-C6	61.90

continued on next page

END MILLS FOR HARDENED STEELS

Square – For Steels Up to 55 Rc (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂	D ₂ (h6)	L ₁	5 FL	PRICE
+.0005" -.0005"	+.00mm -.02mm	decimal equivalent	+.010" -.000" +.25mm -.00mm				
.062 (1/16)		.0620	.050 (0.8x)	1/4	2-1/2	859462-C6	64.70
.062 (1/16)		.0620	.093 (1.5x)	1/4	2-1/2	907462-C6	61.90
.062 (1/16)		.0620	.186 (3x)	1/4	2-1/2	915962-C6	61.90
.062 (1/16)		.0620	.250 (4x)	1/4	2-1/2	824962-C6	65.30
.062 (1/16)		.0620	.312 (5x)	1/4	2-1/2	885262-C6	67.50
.070		.0700	.105 (1.5x)	1/4	2-1/2	907470-C6	64.70
.070		.0700	.210 (3x)	1/4	2-1/2	915970-C6	64.70
.078 (5/64)		.0780	.117 (1.5x)	1/4	2-1/2	907478-C6	64.70
.078 (5/64)		.0780	.234 (3x)	1/4	2-1/2	915978-C6	64.70
.078 (5/64)		.0780	.312 (4x)	1/4	2-1/2	824978-C6	67.60
.078 (5/64)		.0780	.406 (5x)	1/4	2-1/2	885278-C6	70.40
2.0 mm		.0787	3.00 mm (1.5x)	6 mm	63 mm	777845-C6	71.40
2.0 mm		.0787	6.00 mm (3x)	6 mm	63 mm	897845-C6	71.40
.080		.0800	.120 (1.5x)	1/4	2-1/2	907480-C6	64.70
.080		.0800	.240 (3x)	1/4	2-1/2	915980-C6	64.70
.090		.0900	.135 (1.5x)	1/4	2-1/2	907490-C6	64.70
.090		.0900	.270 (3x)	1/4	2-1/2	915990-C6	64.70
.093 (3/32)		.0930	.074 (0.8x)	1/4	2-1/2	859493-C6	68.50
.093 (3/32)		.0930	.140 (1.5x)	1/4	2-1/2	907493-C6	65.70
.093 (3/32)		.0930	.279 (3x)	1/4	2-1/2	915993-C6	65.70
.093 (3/32)		.0930	.372 (4x)	1/4	2-1/2	824993-C6	69.00
.093 (3/32)		.0930	.500 (5x)	1/4	2-1/2	885293-C6	71.20
.100		.1000	.150 (1.5x)	1/4	2-1/2	907500-C6	65.70
.100		.1000	.300 (3x)	1/4	2-1/2	916000-C6	65.70
.109 (7/64)		.1090	.164 (1.5x)	1/4	2-1/2	907502-C6	66.20
.109 (7/64)		.1090	.327 (3x)	1/4	2-1/2	916002-C6	66.20
.118		.1180	.177 (1.5x)	1/4	2-1/2	907505-C6	66.70
.118		.1180	.354 (3x)	1/4	2-1/2	916005-C6	66.70
3.0 mm		.1181	9.00 mm (3x)	6 mm	63 mm	897857-C6	72.80

D ₁			L ₂	D ₂ (h6)	L ₁	5 FL	PRICE
+.000" -.002"	+.00mm -.04mm	decimal equivalent	+.030" -.000" +.75mm -.00mm				
.125 (1/8)		.1250	.100 (0.8x)	1/4	2-1/2	859508-C6	69.30
.125 (1/8)		.1250	.187 (1.5x)	1/4	2-1/2	907508-C6	66.40
.125 (1/8)		.1250	.375 (3x)	1/4	2-1/2	916008-C6	66.40
.125 (1/8)		.1250	.500 (4x)	1/4	2-1/2	825008-C6	69.80
.125 (1/8)		.1250	.625 (5x)	1/4	2-1/2	885308-C6	72.00
.140 (9/64)		.1406	.220 (1.5x)	1/4	2-1/2	907509-C6	69.90
.140 (9/64)		.1406	.425 (3x)	1/4	2-1/2	916009-C6	69.90
NEW .140 (9/64)		.1406	.750 (5x)	1/4	2-1/2	885309-C6	72.00
.156 (5/32)		.1562	.235 (1.5x)	1/4	2-1/2	907510-C6	66.40
.156 (5/32)		.1562	.468 (3x)	1/4	2-1/2	916010-C6	66.40
.156 (5/32)		.1562	.625 (4x)	1/4	2-1/2	825010-C6	69.80
.156 (5/32)		.1562	.750 (5x)	1/4	3	885310-C6	72.00
NEW .172 (11/64)		.1718	.516 (3x)	1/4	2-1/2	916011-C6	71.20

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END MILLS FOR HARDENED STEELS

Square – For Steels Up to 55 Rc (cont.)

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HARDENED STEELS

CUTTER DIAMETER			LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁							
+.000" -.002"	+.00mm -.04mm	decimal equivalent	L ₂ +.030" -.000" +.75mm -.00mm	D ₂ (h6)	L ₁	5 FL	PRICE
.187 (3/16)		.1875	.150 (0.8x)	1/4	2-1/2	859512-C6	70.10
.187 (3/16)		.1875	.285 (1.5x)	1/4	2-1/2	907512-C6	69.00
.187 (3/16)		.1875	.562 (3x)	1/4	2-1/2	916012-C6	69.00
.187 (3/16)		.1875	1.000 (5x)	1/4	3	885312-C6	76.00
.218 (7/32)		.2187	.656 (3x)	1/4	2-1/2	916014-C6	71.20
	6.0 mm	.2362	18.00 mm (3x)	6 mm	63 mm	897866-C6	73.10
.250 (1/4)		.2500	.200 (0.8x)	1/4	2-1/2	859516-C6	78.00
.250 (1/4)		.2500	.375 (1.5x)	1/4	2-1/2	907516-C6	76.90
.250 (1/4)		.2500	.750 (3x)	1/4	2-1/2	916016-C6	76.90
.250 (1/4)		.2500	1.250 (5x)	1/4	4	885316-C6	83.60
.312 (5/16)		.3125	.470 (1.5x)	5/16	2-1/2	907520-C6	83.80
.312 (5/16)		.3125	1.000 (3x)	5/16	2-1/2	916020-C6	83.80
.375 (3/8)		.3750	.570 (1.5x)	3/8	2-1/2	907524-C6	96.80
.375 (3/8)		.3750	1.125 (3x)	3/8	2-1/2	916024-C6	96.80
.500 (1/2)		.5000	.750 (1.5x)	1/2	3	907532-C6	116.90
.500 (1/2)		.5000	1.500 (3x)	1/2	3	916032-C6	116.90

NEW

NEW

NEW

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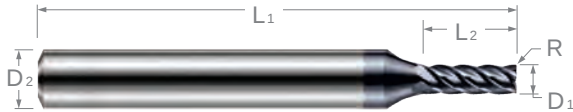
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END MILLS FOR HARDENED STEELS

Corner Radius – For Steels Up to 55 Rc



◀ **5 Flute, Variable
Helix Design**

HARDENED STEELS

- **Designed to mill hardened tool, die, and mold steels up to 55Rc**
- Also excellent for stainless steel, inconel, titanium, and other high temperature alloys
- 5 flute, variable helix design (approx. 37°) for improved slotting and roughing
- Corner radius for improved strength
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- Increased shank diameter to maintain strength and stiffness ➤ h6 shank tolerance for high precision tool holders
- Center cutting ➤ Solid carbide ➤ CNC ground in the USA 🇺🇸

mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁			R	L ₂	D ₂ (h6)	L ₁	5 FL	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .001" / - .001" / + .025mm / - .025mm	+ .010" / - .000" / + .25mm / - .00mm				
.015 (1/64)		.0150	.003	.045 (3x)	1/4	2-1/2	760415-C6	62.80
.020		.0200	.005	.030 (1.5x)	1/4	2-1/2	920420-C6	61.90
.020		.0200	.005	.060 (3x)	1/4	2-1/2	933220-C6	62.80
.031 (1/32)		.0310	.005	.047 (1.5x)	1/4	2-1/2	920431-C6	61.90
.031 (1/32)		.0310	.005	.093 (3x)	1/4	2-1/2	933231-C6	61.90
.031 (1/32)		.0310	.005	.156 (5x)	1/4	2-1/2	851731-C6	67.50
.031 (1/32)		.0310	.010	.093 (3x)	1/4	2-1/2	852131-C6	61.90
.039		.0390	.005	.117 (3x)	1/4	2-1/2	933239-C6	62.20
1.0 mm		.0393	.20 mm	3.00 mm (3x)	6 mm	63 mm	894622-C6	68.10
.040		.0400	.005	.060 (1.5x)	1/4	2-1/2	920440-C6	62.20
.040		.0400	.005	.120 (3x)	1/4	2-1/2	933240-C6	62.20
.047 (3/64)		.0470	.005	.071 (1.5x)	1/4	2-1/2	920447-C6	61.90
.047 (3/64)		.0470	.005	.141 (3x)	1/4	2-1/2	933247-C6	61.90
.047 (3/64)		.0470	.005	.250 (5x)	1/4	2-1/2	851747-C6	67.50
.047 (3/64)		.0470	.010	.141 (3x)	1/4	2-1/2	852147-C6	61.90
.047 (3/64)		.0470	.010	.250 (5x)	1/4	2-1/2	750047-C6	67.50
.050		.0500	.005	.150 (3x)	1/4	2-1/2	933250-C6	62.20
.060		.0600	.005	.090 (1.5x)	1/4	2-1/2	920460-C6	61.90
.060		.0600	.005	.180 (3x)	1/4	2-1/2	933260-C6	62.20
.062 (1/16)		.0620	.005	.093 (1.5x)	1/4	2-1/2	920462-C6	61.90
.062 (1/16)		.0620	.005	.186 (3x)	1/4	2-1/2	933262-C6	61.90
.062 (1/16)		.0620	.005	.312 (5x)	1/4	2-1/2	851762-C6	67.50
.062 (1/16)		.0620	.010	.093 (1.5x)	1/4	2-1/2	872762-C6	61.90
.062 (1/16)		.0620	.010	.186 (3x)	1/4	2-1/2	852162-C6	61.90
.062 (1/16)		.0620	.010	.312 (5x)	1/4	2-1/2	750062-C6	67.50
.062 (1/16)		.0620	.020	.186 (3x)	1/4	2-1/2	813562-C6	61.90
.070		.0700	.005	.210 (3x)	1/4	2-1/2	933270-C6	65.20
.078 (5/64)		.0780	.005	.117 (1.5x)	1/4	2-1/2	920478-C6	64.70
.078 (5/64)		.0780	.005	.234 (3x)	1/4	2-1/2	933278-C6	64.70
.078 (5/64)		.0780	.005	.406 (5x)	1/4	2-1/2	851778-C6	70.40
.078 (5/64)		.0780	.010	.117 (1.5x)	1/4	2-1/2	872778-C6	64.70
.078 (5/64)		.0780	.010	.234 (3x)	1/4	2-1/2	852178-C6	64.70

NEW

NEW

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END MILLS FOR HARDENED STEELS

Corner Radius – For Steels Up to 55 Rc (cont.)



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	CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
	D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent	R +.001" -.001" +.025mm -.025mm	L ₂ +.010" -.000" +.25mm -.00mm	D ₂ (h6)	L ₁	5 FL	PRICE
	2.0 mm		.0787	.20 mm	6.00 mm (3x)	6 mm	63 mm	894645-C6	71.40
	.080		.0800	.005	.240 (3x)	1/4	2-1/2	933280-C6	66.20
	.090		.0900	.005	.270 (3x)	1/4	2-1/2	933290-C6	66.20
	.093 (3/32)		.0930	.005	.140 (1.5x)	1/4	2-1/2	920493-C6	65.70
	.093 (3/32)		.0930	.005	.279 (3x)	1/4	2-1/2	933293-C6	65.70
NEW	.093 (3/32)		.0930	.005	.372 (4x)	1/4	2-1/2	750893-C6	68.50
	.093 (3/32)		.0930	.005	.500 (5x)	1/4	2-1/2	851793-C6	71.20
	.093 (3/32)		.0930	.010	.140 (1.5x)	1/4	2-1/2	872793-C6	65.70
	.093 (3/32)		.0930	.010	.279 (3x)	1/4	2-1/2	852193-C6	65.70
NEW	.093 (3/32)		.0930	.010	.500 (5x)	1/4	2-1/2	750093-C6	71.20
	.093 (3/32)		.0930	.015	.279 (3x)	1/4	2-1/2	852793-C6	65.70
	.093 (3/32)		.0930	.020	.279 (3x)	1/4	2-1/2	813593-C6	65.70
	.093 (3/32)		.0930	.030	.279 (3x)	1/4	2-1/2	853293-C6	65.70
	.100		.1000	.005	.300 (3x)	1/4	2-1/2	933300-C6	66.20
	.109 (7/64)		.1090	.005	.327 (3x)	1/4	2-1/2	933302-C6	65.70
	.118		.1180	.005	.354 (3x)	1/4	2-1/2	933305-C6	66.70
	3.0 mm		.1181	.20 mm	9.00 mm (3x)	6 mm	63 mm	894657-C6	72.80
	D ₁ +.000" -.002"	+.00mm -.04mm	decimal equivalent	R +.001" -.001" +.025mm -.025mm	L ₂ +.030" -.000" +.75mm -.00mm	D ₂ (h6)	L ₁	5 FL	PRICE
	.125 (1/8)		.1250	.005	.187 (1.5x)	1/4	2-1/2	920508-C6	66.40
	.125 (1/8)		.1250	.005	.375 (3x)	1/4	2-1/2	933308-C6	66.40
NEW	.125 (1/8)		.1250	.005	.500 (4x)	1/4	2-1/2	750908-C6	69.20
	.125 (1/8)		.1250	.005	.625 (5x)	1/4	2-1/2	851808-C6	72.00
	.125 (1/8)		.1250	.010	.187 (1.5x)	1/4	2-1/2	872808-C6	66.40
	.125 (1/8)		.1250	.010	.375 (3x)	1/4	2-1/2	852208-C6	66.40
	.125 (1/8)		.1250	.010	.625 (5x)	1/4	2-1/2	781608-C6	72.00
	.125 (1/8)		.1250	.015	.187 (1.5x)	1/4	2-1/2	798008-C6	66.40
	.125 (1/8)		.1250	.015	.375 (3x)	1/4	2-1/2	852808-C6	66.40
	.125 (1/8)		.1250	.020	.375 (3x)	1/4	2-1/2	813608-C6	66.40
	.125 (1/8)		.1250	.030	.187 (1.5x)	1/4	2-1/2	761308-C6	66.40
	.125 (1/8)		.1250	.030	.375 (3x)	1/4	2-1/2	853308-C6	66.40
	.140 (9/64)		.1406	.005	.220 (1.5x)	1/4	2-1/2	920509-C6	66.40
	.140 (9/64)		.1406	.005	.425 (3x)	1/4	2-1/2	933309-C6	66.40
	.156 (5/32)		.1562	.005	.235 (1.5x)	1/4	2-1/2	920510-C6	66.40
	.156 (5/32)		.1562	.005	.468 (3x)	1/4	2-1/2	933310-C6	66.40
	.156 (5/32)		.1562	.005	.750 (5x)	1/4	3	851810-C6	72.00
NEW	.156 (5/32)		.1562	.010	.468 (3x)	1/4	2-1/2	852210-C6	66.40
	.156 (5/32)		.1562	.015	.468 (3x)	1/4	2-1/2	852810-C6	66.40
	.156 (5/32)		.1562	.030	.468 (3x)	1/4	2-1/2	853310-C6	66.40

continued on next page

Access **Simulation Files** in DXF format for every Harvey Tool product, downloadable from [Harveytool.com](https://www.harveytool.com)

END MILLS FOR HARDENED STEELS

Corner Radius – For Steels Up to 55 Rc (cont.)



continued from previous page

HARDENED STEELS

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.000" -.002"	+ .00 mm -.04 mm	decimal equivalent	R +.001" -.001" +.025 mm -.025 mm	L ₂ +.030" -.000" +.75 mm -.00 mm	D ₂ (h6)	L ₁	5 FL	PRICE
.187 (3/16)		.1875	.005	.285 (1.5x)	1/4	2-1/2	920512-C6	69.00
.187 (3/16)		.1875	.005	.562 (3x)	1/4	2-1/2	933312-C6	69.00
.187 (3/16)		.1875	.005	1.000 (5x)	1/4	3	851812-C6	76.00
.187 (3/16)		.1875	.010	.562 (3x)	1/4	2-1/2	852212-C6	69.00
.187 (3/16)		.1875	.015	.562 (3x)	1/4	2-1/2	852812-C6	69.00
.187 (3/16)		.1875	.030	.285 (1.5x)	1/4	2-1/2	761312-C6	69.00
.187 (3/16)		.1875	.030	.562 (3x)	1/4	2-1/2	853312-C6	69.00
.187 (3/16)		.1875	.060	.562 (3x)	1/4	2-1/2	800712-C6	69.00
6.0 mm		.2362	.20 mm	18.00 mm (3x)	6 mm	63 mm	894666-C6	73.10
.250 (1/4)		.2500	.005	.375 (1.5x)	1/4	2-1/2	920516-C6	76.90
.250 (1/4)		.2500	.005	.750 (3x)	1/4	2-1/2	933316-C6	76.90
.250 (1/4)		.2500	.005	1.250 (5x)	1/4	4	851816-C6	83.60
.250 (1/4)		.2500	.010	.750 (3x)	1/4	2-1/2	852216-C6	76.90
.250 (1/4)		.2500	.015	.375 (1.5x)	1/4	2-1/2	798016-C6	76.90
.250 (1/4)		.2500	.015	.750 (3x)	1/4	2-1/2	852816-C6	76.90
.250 (1/4)		.2500	.030	.750 (3x)	1/4	2-1/2	853316-C6	76.90
.312 (5/16)		.3125	.015	1.000 (3x)	5/16	2-1/2	852720-C6	89.60
.375 (3/8)		.3750	.015	1.125 (3x)	3/8	2-1/2	852824-C6	99.20
.500 (1/2)		.5000	.015	1.500 (3x)	1/2	3	852832-C6	119.90
.500 (1/2)		.5000	.030	1.500 (3x)	1/2	3	853332-C6	119.90

NEW

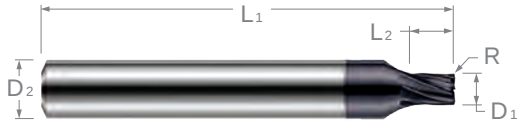
SPEEDS & FEEDS (End Mills for Hardened Steels – Square & Corner Radius – For Steels Up to 55Rc)

Important Note: Values in table are in inches and are based on standard (3x Dia) length of cut end mills. For shorter lengths of cuts, table values of IPT must be increased (for 0.8x, increase to 125%; for 1.5x, increase to 110%). For longer lengths of cut, table values of IPT and DOC must be reduced (for 4x, reduce to 90%; for 5x, reduce to 85%). For complete speeds and feeds charts, please see www.harveytool.com.

Material	Hardness	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter													Depth of Cut	
			.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	Radial	Axial	
Hardened Steels	38-44 Rc	100	Slotting	.00003	.00007	.00010	.00013	.00017	.00020	.00027	.00040	.00054	.00067	.00081	.00108	1 x Dia	.30 x Dia
			Profiling	.00004	.00008	.00012	.00016	.00020	.00024	.00033	.00049	.00065	.00082	.00098	.00131	.3 x Dia	.5 x Dia
Titanium Alloys	45-55 Rc	60	Slotting	.00002	.00004	.00006	.00009	.00011	.00013	.00017	.00026	.00035	.00043	.00052	.00069	1 x Dia	.15 x Dia
Nickel Alloys			Profiling	.00002	.00005	.00007	.00009	.00012	.00014	.00019	.00028	.00038	.00047	.00057	.00076	.15 x Dia	.5 x Dia

END MILLS FOR HARDENED STEELS

Corner Radius – For Steels 45 - 68 Rc



7 Flute, Variable Helix Design

- Designed to mill hardened steels between 45Rc and 68Rc (including stainless, tool, and mold steels)
- 7 flute, variable helix design (approx. 20°) and specialized geometry for improved material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- Corner radius for improved strength h6 shank tolerance for high precision tool holders
- End cutting (not center cutting) Solid carbide CNC ground in the USA 🇺🇸

mm & in

CUTTER DIAMETER	CORNER RADIUS	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁ $\begin{smallmatrix} +.0005'' \\ -.0005'' \end{smallmatrix}$	R $\begin{smallmatrix} +.001'' \\ -.001'' \end{smallmatrix}$	L ₂ $\begin{smallmatrix} +.010'' \\ -.000'' \end{smallmatrix}$	D ₂ (h6)	L ₁	7 FL	PRICE
.030	.005	.045 (1.5x)	1/4	2-1/2	903130-C6	70.60
.030	.005	.090 (3x)	1/4	2-1/2	910830-C6	70.60
.031 (1/32)	.005	.047 (1.5x)	1/4	2-1/2	903131-C6	68.40
.031 (1/32)	.005	.093 (3x)	1/4	2-1/2	910831-C6	68.40
.031 (1/32)	.005	.156 (5x)	1/4	2-1/2	845231-C6	74.00
.040	.005	.120 (3x)	1/4	2-1/2	910840-C6	70.60
.047 (3/64)	.005	.071 (1.5x)	1/4	2-1/2	903147-C6	68.40
.047 (3/64)	.005	.141 (3x)	1/4	2-1/2	910847-C6	68.40
.050	.005	.150 (3x)	1/4	2-1/2	910850-C6	70.60
.060	.005	.180 (3x)	1/4	2-1/2	910860-C6	70.60
.062 (1/16)	.005	.093 (1.5x)	1/4	2-1/2	903162-C6	68.40
.062 (1/16)	.005	.186 (3x)	1/4	2-1/2	910862-C6	68.40
.062 (1/16)	.005	.312 (5x)	1/4	2-1/2	845262-C6	74.00
.062 (1/16)	.010	.186 (3x)	1/4	2-1/2	850562-C6	68.40
.070	.005	.210 (3x)	1/4	2-1/2	910870-C6	70.60
.078 (5/64)	.005	.117 (1.5x)	1/4	2-1/2	903178-C6	71.80
.078 (5/64)	.005	.234 (3x)	1/4	2-1/2	910878-C6	71.80
.080	.005	.240 (3x)	1/4	2-1/2	910880-C6	74.10
.090	.005	.270 (3x)	1/4	2-1/2	910890-C6	74.10
.093 (3/32)	.005	.140 (1.5x)	1/4	2-1/2	903193-C6	72.40
.093 (3/32)	.005	.279 (3x)	1/4	2-1/2	910893-C6	72.40
.093 (3/32)	.005	.500 (5x)	1/4	2-1/2	845293-C6	78.00
.093 (3/32)	.010	.279 (3x)	1/4	2-1/2	850593-C6	72.40
.100	.005	.300 (3x)	1/4	2-1/2	910900-C6	74.10
.109 (7/64)	.005	.327 (3x)	1/4	2-1/2	910902-C6	74.10
.118	.005	.354 (3x)	1/4	2-1/2	910905-C6	74.10

D ₁ $\begin{smallmatrix} +.000'' \\ -.002'' \end{smallmatrix}$	R $\begin{smallmatrix} +.001'' \\ -.001'' \end{smallmatrix}$	L ₂ $\begin{smallmatrix} +.030'' \\ -.000'' \end{smallmatrix}$	D ₂ (h6)	L ₁	7 FL	PRICE
.125 (1/8)	.005	.187 (1.5x)	1/4	2-1/2	903208-C6	73.50
.125 (1/8)	.005	.375 (3x)	1/4	2-1/2	910908-C6	73.50
.125 (1/8)	.005	.625 (5x)	1/4	2-1/2	845308-C6	73.50
.125 (1/8)	.010	.375 (3x)	1/4	2-1/2	850608-C6	73.50
.125 (1/8)	.015	.187 (1.5x)	1/4	2-1/2	879108-C6	73.50
.125 (1/8)	.015	.375 (3x)	1/4	2-1/2	882308-C6	73.50
.125 (1/8)	.030	.375 (3x)	1/4	2-1/2	883508-C6	73.50

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END MILLS FOR HARDENED STEELS

Corner Radius – For Steels 45 - 68 Rc (cont.)



continued from previous page

CUTTER DIAMETER	CORNER RADIUS	LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ ^{+0.000"} -0.002"	R ^{+0.001"} -0.001"	L ₂ ^{+0.030"} -0.000"	D ₂ (h6)	L ₁	7 FL	PRICE
.140 (9/64)	.005	.425 (3x)	1/4	2-1/2	910909-C6	75.80
.156 (5/32)	.005	.235 (1.5x)	1/4	2-1/2	903210-C6	73.50
.156 (5/32)	.005	.468 (3x)	1/4	2-1/2	910910-C6	73.50
.187 (3/16)	.005	.285 (1.5x)	1/4	2-1/2	903212-C6	76.50
.187 (3/16)	.005	.562 (3x)	1/4	2-1/2	910912-C6	76.50
.187 (3/16)	.010	.562 (3x)	1/4	2-1/2	850612-C6	76.50
.187 (3/16)	.015	.285 (1.5x)	1/4	2-1/2	879112-C6	76.50
.187 (3/16)	.015	.562 (3x)	1/4	2-1/2	882312-C6	76.50
.250 (1/4)	.005	.375 (1.5x)	1/4	2-1/2	903216-C6	85.10
.250 (1/4)	.005	.750 (3x)	1/4	2-1/2	910916-C6	85.10
.250 (1/4)	.010	.750 (3x)	1/4	2-1/2	850616-C6	85.10
.250 (1/4)	.015	.375 (1.5x)	1/4	2-1/2	879116-C6	85.10
.250 (1/4)	.015	.750 (3x)	1/4	2-1/2	882316-C6	85.10
.250 (1/4)	.030	.750 (3x)	1/4	2-1/2	883516-C6	85.10
.312 (5/16)	.015	1.000 (3x)	5/16	2-1/2	882320-C6	88.50
.312 (5/16)	.030	1.000 (3x)	5/16	2-1/2	883520-C6	88.50
.375 (3/8)	.015	.570 (1.5x)	3/8	2-1/2	879124-C6	95.70
.375 (3/8)	.015	1.125 (3x)	3/8	2-1/2	882324-C6	95.70
.375 (3/8)	.030	.570 (1.5x)	3/8	2-1/2	868024-C6	95.70
.375 (3/8)	.030	1.125 (3x)	3/8	2-1/2	883524-C6	95.70
.500 (1/2)	.015	.750 (1.5x)	1/2	3	879132-C6	106.00
.500 (1/2)	.015	1.500 (3x)	1/2	3	882332-C6	106.00
.500 (1/2)	.030	.750 (1.5x)	1/2	3	868032-C6	106.00
.500 (1/2)	.030	1.500 (3x)	1/2	3	883532-C6	106.00

HARDENED STEELS

SPEEDS & FEEDS (End Mills for Hardened Steels – Square & Corner Radius For Steels 45 - 68Rc)

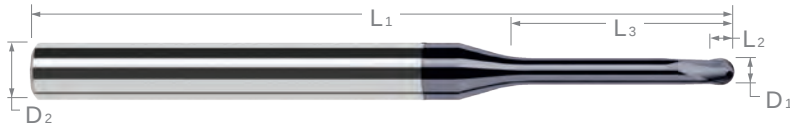
Important Note: Values in table are in inches and are based on standard (3x Dia) length of cut end mills. For shorter lengths of cuts, table values of IPT must be increased (for 0.8x, increase to 114%; for 1.5x, increase to 110%). For longer lengths of cut, table values of IPT and DOC must be reduced (for 5x, reduce to 90%). For complete speeds and feeds charts, please see www.harveytool.com.

Material	Hardness	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter													Depth of Cut	
			.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	Radial	Axial	
Hardened Steels	45 - 55 Rc	60	Semi-Roughing	.00004	.00008	.00012	.00015	.00019	.00023	.00031	.00047	.00062	.00078	.00094	.00125	.15 x Dia	.25 x Dia
			Finishing	.00005	.00009	.00014	.00019	.00024	.00028	.00038	.00056	.00076	.00094	.00113	.00151	.08 x Dia	.5 x Dia
Titanium Alloys	56 - 68 Rc	50	Semi-Roughing	.00003	.00006	.00009	.00012	.00016	.00019	.00025	.00037	.00050	.00062	.00075	.00100	.12 x Dia	.20 x Dia
Nickel Alloys			Finishing	.00003	.00007	.00010	.00014	.00017	.00020	.00027	.00041	.00055	.00069	.00082	.00110	.08 x Dia	.5 x Dia

END MILLS FOR HARDENED STEELS

Finishers – Ball

HARDENED STEELS

Stub Flute and
Large Rigid Core

- **Designed to profile and finish hardened tool, die, and mold steels 46Rc to 68Rc**
- Select carbide grade for improved edge retention
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- Geometry includes stub flute, large rigid core diameter, and eccentric relief
- Increased shank diameter to maintain strength and stiffness
- h6 shank tolerance for high precision tool holders ➤ Center cutting
- Reduced neck diameter to avoid heeling ➤ CNC ground in the USA 🇺🇸

mm & in

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO 2 FLUTE		AITIN NANO 3 FLUTE	
D ₁										
+ .0000" / - .0006"	+ .000mm / - .014mm	decimal equivalent	L ₂ + .010" / - .000" / + .125mm / - .000mm	L ₃ + .010" / - .000" / + .125mm / - .000mm	D ₂ (h6)	L ₁	2 FL	PRICE	3 FL	PRICE
.008		.0080	.006	.012 (1.5x)	1/4	2-1/2	37808-C6	100.80		
.008		.0080	.006	.025 (3x)	1/4	2-1/2	31408-C6	100.80		
.008		.0080	.006	.040 (5x)	1/4	2-1/2	38708-C6	105.70		
.010		.0100	.008	.015 (1.5x)	1/4	2-1/2	37810-C6	91.50		
.010		.0100	.008	.031 (3x)	1/4	2-1/2	31410-C6	91.50		
.010		.0100	.008	.050 (5x)	1/4	2-1/2	38710-C6	95.80		
.015 (1/64)		.0150	.012	-	1/4	2-1/2	958315-C6	77.20		
.015 (1/64)		.0150	.012	.023 (1.5x)	1/4	2-1/2	37815-C6	73.10		
.015 (1/64)		.0150	.012	.047 (3x)	1/4	2-1/2	31415-C6	73.10	813115-C6	77.90
.015 (1/64)		.0150	.012	.062 (4x)	1/4	2-1/2	881515-C6	75.80		
.015 (1/64)		.0150	.012	.078 (5x)	1/4	2-1/2	38715-C6	75.80	812915-C6	80.50
.015 (1/64)		.0150	.012	.125 (8x)	1/4	2-1/2	32015-C6	80.20		
.015 (1/64)		.0150	.012	.187 (12x)	1/4	2-1/2	33815-C6	98.60		
.020		.0200	.016	-	1/4	2-1/2	958320-C6	77.20		
.020		.0200	.016	.031 (1.5x)	1/4	2-1/2	37820-C6	73.10		
.020		.0200	.016	.062 (3x)	1/4	2-1/2	31420-C6	73.10		
.020		.0200	.016	.080 (4x)	1/4	2-1/2	881520-C6	75.80		
.020		.0200	.016	.100 (5x)	1/4	2-1/2	38720-C6	75.80		
.020		.0200	.016	.160 (8x)	1/4	2-1/2	32020-C6	76.50		
.020		.0200	.016	.200 (10x)	1/4	2-1/2	919120-C6	88.30		
.025		.0250	.020	.038 (1.5x)	1/4	2-1/2	37825-C6	73.10		
.025		.0250	.020	.075 (3x)	1/4	2-1/2	31425-C6	73.10		
.025		.0250	.020	.125 (5x)	1/4	2-1/2	38725-C6	75.80		
.031 (1/32)		.0310	.025	-	1/4	2-1/2	958331-C6	66.40		
.031 (1/32)		.0310	.025	.047 (1.5x)	1/4	2-1/2	37831-C6	62.50		
.031 (1/32)		.0310	.025	.093 (3x)	1/4	2-1/2	31431-C6	62.50	813131-C6	67.30
.031 (1/32)		.0310	.025	.125 (4x)	1/4	2-1/2	881531-C6	66.40		
.031 (1/32)		.0310	.025	.156 (5x)	1/4	2-1/2	38731-C6	68.40	812931-C6	73.10
.031 (1/32)		.0310	.025	.187 (6x)	1/4	2-1/2	858031-C6	69.80		
.031 (1/32)		.0310	.025	.218 (7x)	1/4	2-1/2	863231-C6	70.90		
.031 (1/32)		.0310	.025	.250 (8x)	1/4	2-1/2	32031-C6	72.10		
.031 (1/32)		.0310	.025	.312 (10x)	1/4	2-1/2	919131-C6	84.60		
.031 (1/32)		.0310	.025	.375 (12x)	1/4	2-1/2	33831-C6	84.60		
.031 (1/32)		.0310	.025	.470 (15x)	1/4	2-1/2	973231-C6	97.20		

continued on next page

END MILLS FOR HARDENED STEELS

Finishers – Ball (cont.)

continued from previous page

mm & in			CUTTER DIAMETER	LENGTH OF CUT	OVERALL REACH	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO 2 FLUTE		AITIN NANO 3 FLUTE	
D ₁								2 FL	PRICE	3 FL	PRICE
+ .0000" - .0006"	+ .000mm - .014mm	decimal equivalent	L ₂ + .010" - .000" + .125mm - .000mm	L ₃ + .010" - .000" + .125mm - .000mm	D ₂ (h6)	L ₁					
.039		.0390	.031	-	1/4	2-1/2	958339-C6	66.40			
.039		.0390	.031	.062 (1.5x)	1/4	2-1/2	37839-C6	62.50			
.039		.0390	.031	.117 (3x)	1/4	2-1/2	31439-C6	62.50			
.039		.0390	.031	.156 (4x)	1/4	2-1/2	881539-C6	68.40			
.039		.0390	.031	.203 (5x)	1/4	2-1/2	38739-C6	68.40			
.039		.0390	.031	.312 (8x)	1/4	2-1/2	32039-C6	72.10			
.039		.0390	.031	.468 (12x)	1/4	2-1/2	33839-C6	84.60			
	1.0 mm	.0393	.80 mm	3.00 mm (3x)	6 mm	63 mm	882922-C6	68.40			
	1.0 mm	.0393	.80 mm	5.00 mm (5x)	6 mm	63 mm	881722-C6	74.10			
.040		.0400	.032	.062 (1.5x)	1/4	2-1/2	37840-C6	62.50			
.040		.0400	.032	.125 (3x)	1/4	2-1/2	31440-C6	62.50			
.047 (3/64)		.0470	.038	-	1/4	2-1/2	958347-C6	66.40			
.047 (3/64)		.0470	.038	.071 (1.5x)	1/4	2-1/2	37847-C6	62.50			
.047 (3/64)		.0470	.038	.141 (3x)	1/4	2-1/2	31447-C6	62.50	813147-C6	67.30	
.047 (3/64)		.0470	.038	.187 (4x)	1/4	2-1/2	881547-C6	68.40			
.047 (3/64)		.0470	.038	.250 (5x)	1/4	2-1/2	38747-C6	68.40	812947-C6	73.10	
.047 (3/64)		.0470	.038	.375 (8x)	1/4	2-1/2	32047-C6	72.10			
.047 (3/64)		.0470	.038	.470 (10x)	1/4	2-1/2	919147-C6	84.60			
.047 (3/64)		.0470	.038	.564 (12x)	1/4	2-1/2	33847-C6	84.60			
.047 (3/64)		.0470	.038	.710 (15x)	1/4	2-1/2	973247-C6	97.20			
.050		.0500	.040	.078 (1.5x)	1/4	2-1/2	37850-C6	62.50			
.050		.0500	.040	.150 (3x)	1/4	2-1/2	31450-C6	62.50			
.060		.0600	.048	.093 (1.5x)	1/4	2-1/2	37860-C6	62.50			
.060		.0600	.048	.180 (3x)	1/4	2-1/2	31460-C6	62.50			
.062 (1/16)		.0620	.050	-	1/4	2-1/2	958362-C6	66.40			
.062 (1/16)		.0620	.050	.093 (1.5x)	1/4	2-1/2	37862-C6	62.50			
.062 (1/16)		.0620	.050	.187 (3x)	1/4	2-1/2	31462-C6	62.50	813162-C6	67.30	
.062 (1/16)		.0620	.050	.250 (4x)	1/4	2-1/2	881562-C6	66.40			
.062 (1/16)		.0620	.050	.312 (5x)	1/4	2-1/2	38762-C6	68.40	812962-C6	73.10	
.062 (1/16)		.0620	.050	.375 (6x)	1/4	2-1/2	858062-C6	69.80			
.062 (1/16)		.0620	.050	.437 (7x)	1/4	2-1/2	863262-C6	70.90			
.062 (1/16)		.0620	.050	.500 (8x)	1/4	2-1/2	32062-C6	72.10			
.062 (1/16)		.0620	.050	.625 (10x)	1/4	2-1/2	919162-C6	92.10			
.062 (1/16)		.0620	.050	.750 (12x)	1/4	4	33862-C6	92.10			
.062 (1/16)		.0620	.050	.950 (15x)	1/4	4	973262-C6	105.00			
.078 (5/64)		.0780	.062	-	1/4	2-1/2	958378-C6	66.40			
.078 (5/64)		.0780	.062	.117 (1.5x)	1/4	2-1/2	37878-C6	62.50			
.078 (5/64)		.0780	.062	.234 (3x)	1/4	2-1/2	31478-C6	62.50	813178-C6	67.30	
.078 (5/64)		.0780	.062	.312 (4x)	1/4	2-1/2	881578-C6	68.40			
.078 (5/64)		.0780	.062	.406 (5x)	1/4	2-1/2	38778-C6	68.40	812978-C6	73.10	
.078 (5/64)		.0780	.062	.625 (8x)	1/4	2-1/2	32078-C6	72.10			
.078 (5/64)		.0780	.062	.781 (10x)	1/4	2-1/2	919178-C6	92.10			
.078 (5/64)		.0780	.062	.937 (12x)	1/4	4	33878-C6	92.10			
.078 (5/64)		.0780	.062	1.187 (15x)	1/4	4	973278-C6	105.00			

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END MILLS FOR HARDENED STEELS

Finishers – Ball (cont.)



continued from previous page

HARDENED STEELS

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO 2 FLUTE		AITIN NANO 3 FLUTE	
D ₁ +.0000" -.0006"	+.000mm -.014mm	decimal equivalent	L ₂ +.010" -.000" +.125mm -.000mm	L ₃ +.010" -.000" +.125mm -.000mm	D ₂ (h6)	L ₁	2 FL	PRICE	3 FL	PRICE
2.0 mm	.0787		1.60 mm	6.00 mm (3x)	6 mm	63 mm	882945-C6	68.40		
2.0 mm	.0787		1.60 mm	10.00 mm (5x)	6 mm	63 mm	881745-C6	74.10		
.093 (3/32)	.0930		.074	-	1/4	2-1/2	958393-C6	66.40		
.093 (3/32)	.0930		.074	.140 (1.5x)	1/4	2-1/2	37893-C6	62.50		
.093 (3/32)	.0930		.074	.281 (3x)	1/4	2-1/2	31493-C6	62.50	813193-C6	67.30
.093 (3/32)	.0930		.074	.375 (4x)	1/4	2-1/2	881593-C6	66.40		
.093 (3/32)	.0930		.074	.500 (5x)	1/4	2-1/2	38793-C6	68.40	812993-C6	73.10
.093 (3/32)	.0930		.074	.585 (6x)	1/4	2-1/2	858093-C6	69.80		
.093 (3/32)	.0930		.074	.670 (7x)	1/4	2-1/2	863293-C6	70.90		
.093 (3/32)	.0930		.074	.750 (8x)	1/4	2-1/2	32093-C6	72.10		
.093 (3/32)	.0930		.074	.937 (10x)	1/4	4	919193-C6	92.10		
.093 (3/32)	.0930		.074	1.125 (12x)	1/4	4	33893-C6	92.10		
.093 (3/32)	.0930		.074	1.400 (15x)	1/4	4	973293-C6	105.00		
.118	.1180		.094	.177 (1.5x)	1/4	2-1/2	37905-C6	70.10		
.118	.1180		.094	.354 (3x)	1/4	2-1/2	31505-C6	70.10		
.118	.1180		.094	.625 (5x)	1/4	2-1/2	38805-C6	79.60		
3.0 mm	.1181		2.40 mm	9.00 mm (3x)	6 mm	63 mm	882957-C6	75.80		
3.0 mm	.1181		2.40 mm	15.00 mm (5x)	6 mm	63 mm	881757-C6	85.50		
.125 (1/8)	.1250		.100	-	1/4	2-1/2	958408-C6	74.10		
.125 (1/8)	.1250		.100	.187 (1.5x)	1/4	2-1/2	37908-C6	70.10		
.125 (1/8)	.1250		.100	.375 (3x)	1/4	2-1/2	31508-C6	70.10	813208-C6	74.80
.125 (1/8)	.1250		.100	.500 (4x)	1/4	2-1/2	881608-C6	77.70		
.125 (1/8)	.1250		.100	.625 (5x)	1/4	2-1/2	38808-C6	79.60	813008-C6	84.40
.125 (1/8)	.1250		.100	.750 (6x)	1/4	2-1/2	858108-C6	81.20		
.125 (1/8)	.1250		.100	.875 (7x)	1/4	2-1/2	863308-C6	82.80		
.125 (1/8)	.1250		.100	1.000 (8x)	1/4	2-1/2	32108-C6	84.40		
.125 (1/8)	.1250		.100	1.250 (10x)	1/4	4	919208-C6	99.60		
.125 (1/8)	.1250		.100	1.500 (12x)	1/4	4	33908-C6	99.60		
.125 (1/8)	.1250		.100	1.875 (15x)	1/4	4	973308-C6	112.40		

D ₁ +.000" -.001"	+.000mm -.018mm	decimal equivalent	L ₂ +.020" -.000" +.500mm -.000mm	L ₃ +.020" -.000" +.500mm -.000mm	D ₂ (h6)	L ₁	2 FL	PRICE	3 FL	PRICE
.140 (9/64)	.1406		.112	.220 (1.5x)	1/4	2-1/2	37909-C6	73.30		NEW
.140 (9/64)	.1406		.112	.425 (3x)	1/4	2-1/2			813209-C6	73.30 NEW
.156 (5/32)	.1560		.125	.235 (1.5x)	1/4	2-1/2	37910-C6	70.10		
.156 (5/32)	.1560		.125	.470 (3x)	1/4	2-1/2	31510-C6	70.10		
.156 (5/32)	.1560		.125	.750 (5x)	1/4	2-1/2	38810-C6	79.60		
.187 (3/16)	.1870		.150	-	1/4	2-1/2	958412-C6	74.10		
.187 (3/16)	.1870		.150	.285 (1.5x)	1/4	2-1/2	37912-C6	70.10		
.187 (3/16)	.1870		.150	.570 (3x)	1/4	2-1/2	31512-C6	70.10	813212-C6	74.80
.187 (3/16)	.1870		.150	.750 (4x)	1/4	2-1/2	881612-C6	79.60		
.187 (3/16)	.1870		.150	1.000 (5x)	1/4	2-1/2	38812-C6	79.60	813012-C6	84.40
.187 (3/16)	.1870		.150	1.500 (8x)	1/4	4	32112-C6	93.20		
.187 (3/16)	.1870		.150	2.250 (12x)	1/4	4	33912-C6	112.40		
6.0 mm	.2362		4.80 mm	18.00 mm (3x)	6 mm	63 mm	882966-C6	75.80		
6.0 mm	.2362		4.80 mm	30.00 mm (5x)	6 mm	63 mm	881766-C6	85.50		

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END MILLS FOR HARDENED STEELS

Finishers – Ball (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO 2 FLUTE		AITIN NANO 3 FLUTE	
D ₁										
+ .000" / - .001"	+ .000mm / - .018mm	decimal equivalent	L ₂	L ₃	D ₂ (h6)	L ₁	2 FL	PRICE	3 FL	PRICE
.250 (1/4)		.2500	.200	-	1/4	2-1/2	958416-C6	74.10		
.250 (1/4)		.2500	.200	.375 (1.5x)	1/4	2-1/2	37916-C6	70.10		
.250 (1/4)		.2500	.200	.750 (3x)	1/4	2-1/2	31516-C6	79.60	813216-C6	84.40
.250 (1/4)		.2500	.200	1.000 (4x)	1/4	2-1/2	881616-C6	79.60		
.250 (1/4)		.2500	.200	1.250 (5x)	1/4	2-1/2	38816-C6	79.60	813016-C6	84.40
.250 (1/4)		.2500	.200	1.500 (6x)	1/4	3	858116-C6	86.40		
.250 (1/4)		.2500	.200	1.750 (7x)	1/4	3	863316-C6	86.40		
.250 (1/4)		.2500	.200	2.000 (8x)	1/4	4	32116-C6	93.20		
.312 (5/16)		.3120	.250	.470 (1.5x)	5/16	2-1/2	37920-C6	91.80		
.312 (5/16)		.3120	.250	1.000 (3x)	5/16	2-1/2	31520-C6	97.10		
.375 (3/8)		.3750	.300	.570 (1.5x)	3/8	2-1/2	37924-C6	98.80		
.375 (3/8)		.3750	.300	1.125 (3x)	3/8	2-1/2	31524-C6	104.20		
.375 (3/8)		.3750	.300	2.000 (5x)	3/8	4	38824-C6	116.60		

NEW

HARDENED STEELS

GUIDELINES FOR MILLING HARDENED STEELS

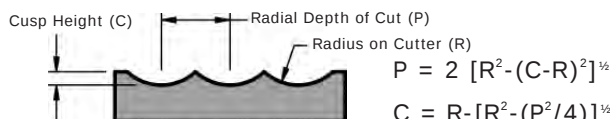
- Rigid machining enhances tool life by centering and balancing tool holders, which minimizes vibration.
- Mist or air coolant is recommended for material hardness of 45Rc or more.
- Enter workpiece slowly by ramping or helical interpolation to avoid potential chipping or breakage.
- Climb Milling will extend tool life and improve workpiece finish.

SPEEDS & FEEDS (End Mills for Hardened Steels – Ball)

Important Note: Values in table are in inches and are based on 2 flute end mills. For end mills with more flutes, table values of IPT must be reduced (for 3 Flutes, reduce to 90%). For complete speeds and feeds charts, please see www.harveytool.com.

Material Hardness	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter												Depth of Cut		
		.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	Radial*	Axial	
45-55 Rc	700	Finishing (.8x Reach)	.00028	.00058	.00088	.00116	.00146	.00174	.00234	.00350	.00468	.00584	.00702	.00936	.10 x Dia	.04 x Dia
		Finishing (1.5x Reach)	.00027	.00056	.00084	.00111	.00140	.00167	.00224	.00335	.00449	.00560	.00673	.00897	.10 x Dia	.04 x Dia
		Finishing (3x Reach)	.00026	.00053	.00081	.00106	.00134	.00160	.00215	.00321	.00429	.00535	.00644	.00858	.10 x Dia	.04 x Dia
		Finishing (4x Reach)	.00025	.00051	.00077	.00102	.00128	.00152	.00205	.00306	.00410	.00511	.00614	.00819	.10 x Dia	.04 x Dia
		Finishing (5x Reach)	.00023	.00048	.00073	.00097	.00122	.00145	.00195	.00292	.00390	.00487	.00585	.00780	.10 x Dia	.04 x Dia
		Finishing (6x Reach)	.00022	.00046	.00070	.00093	.00117	.00139	.00187	.00280	.00374	.00467	.00562	.00749	.10 x Dia	.03 x Dia
		Finishing (7x Reach)	.00022	.00044	.00067	.00089	.00112	.00133	.00179	.00268	.00359	.00448	.00538	.00718	.10 x Dia	.03 x Dia
		Finishing (8x Reach)	.00021	.00043	.00065	.00085	.00107	.00128	.00172	.00257	.00343	.00428	.00515	.00686	.10 x Dia	.03 x Dia
		Finishing (10x Reach)	.00019	.00039	.00059	.00077	.00097	.00116	.00156	.00233	.00312	.00389	.00468	.00624	.10 x Dia	.02 x Dia
56-68 Rc	600	Finishing (12x Reach)	.00016	.00034	.00051	.00068	.00085	.00102	.00137	.00204	.00273	.00341	.00410	.00546	.08 x Dia	.02 x Dia
		Finishing (15x Reach)	.00015	.00031	.00048	.00063	.00079	.00094	.00127	.00190	.00254	.00316	.00380	.00507	.08 x Dia	.01 x Dia
		Finishing (.8x Reach)	.00022	.00046	.00070	.00093	.00117	.00139	.00187	.00280	.00374	.00467	.00562	.00749	.07 x Dia	.04 x Dia
		Finishing (1.5x Reach)	.00022	.00044	.00067	.00089	.00112	.00133	.00179	.00268	.00359	.00448	.00538	.00718	.07 x Dia	.04 x Dia
		Finishing (3x Reach)	.00021	.00043	.00065	.00085	.00107	.00128	.00172	.00257	.00343	.00428	.00515	.00686	.07 x Dia	.04 x Dia
		Finishing (4x Reach)	.00020	.00041	.00062	.00081	.00102	.00122	.00164	.00245	.00328	.00409	.00491	.00655	.07 x Dia	.04 x Dia
		Finishing (5x Reach)	.00019	.00039	.00059	.00077	.00097	.00116	.00156	.00233	.00312	.00389	.00468	.00624	.07 x Dia	.04 x Dia
		Finishing (6x Reach)	.00018	.00037	.00056	.00074	.00093	.00111	.00150	.00224	.00300	.00374	.00449	.00599	.07 x Dia	.03 x Dia
		Finishing (7x Reach)	.00017	.00036	.00054	.00071	.00090	.00107	.00144	.00215	.00287	.00358	.00431	.00574	.07 x Dia	.03 x Dia
		Finishing (8x Reach)	.00016	.00034	.00052	.00068	.00086	.00102	.00137	.00205	.00275	.00343	.00412	.00549	.07 x Dia	.03 x Dia
		Finishing (10x Reach)	.00015	.00031	.00047	.00062	.00078	.00093	.00125	.00187	.00250	.00312	.00374	.00499	.07 x Dia	.02 x Dia
		Finishing (12x Reach)	.00013	.00027	.00041	.00054	.00068	.00081	.00109	.00163	.00218	.00273	.00328	.00437	.06 x Dia	.02 x Dia
		Finishing (15x Reach)	.00012	.00025	.00038	.00050	.00063	.00075	.00101	.00152	.00203	.00253	.00304	.00406	.06 x Dia	.01 x Dia

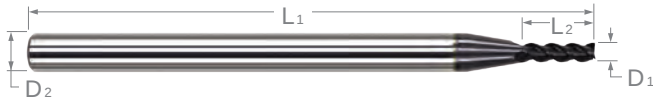
* Operator must consider proper Radial Depth of Cut since it relates directly to cusp height and part finish



VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Square

HIGH TEMP ALLOYS



- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design (approx. 34°) reduces chatter and harmonics and increases material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- Suitable for steels up to 45Rc
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in CUTTER DIAMETER	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
					TOOL #	PRICE
D ₁ +.0005" -.0005" +.00mm -.02mm decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁		
.2 mm .0078	.60 mm (3x)	3	4 mm	50 mm	942804-C6	58.50
.010 .0100	.015 (1.5x)	3	1/8	1-1/2	973710-C6	55.20
.010 .0100	.030 (3x)	3	1/8	1-1/2	967010-C6	54.70
.010 .0100	.050 (5x)	3	1/8	2-1/2	990710-C6	63.20
.015 (1/64) .0150	.012 (0.8x)	3	1/8	1-1/2	888015-C6	45.90
.015 (1/64) .0150	.023 (1.5x)	3	1/8	1-1/2	973715-C6	45.30
.015 (1/64) .0150	.023 (1.5x)	4	1/8	1-1/2	841615-C6	47.20
.015 (1/64) .0150	.045 (3x)	3	1/8	1-1/2	967015-C6	44.80
.015 (1/64) .0150	.045 (3x)	4	1/8	1-1/2	875415-C6	46.70
.015 (1/64) .0150	.062 (4x)	3	1/8	2-1/2	886215-C6	52.90
.015 (1/64) .0150	.078 (5x)	3	1/8	2-1/2	990715-C6	55.00
.4 mm .0157	1.20 mm (3x)	3	4 mm	50 mm	942809-C6	43.20
.5 mm .0196	.40 mm (0.8x)	3	4 mm	50 mm	848011-C6	44.50
.5 mm .0196	.75 mm (1.5x)	3	4 mm	50 mm	954511-C6	43.20
.5 mm .0196	1.50 mm (3x)	3	4 mm	50 mm	942811-C6	43.20
.020 .0200	.016 (0.8x)	3	1/8	1-1/2	888020-C6	40.30
.020 .0200	.030 (1.5x)	3	1/8	1-1/2	973720-C6	39.70
.020 .0200	.030 (1.5x)	4	1/8	1-1/2	841620-C6	41.60
.020 .0200	.060 (3x)	3	1/8	1-1/2	967020-C6	39.30
.020 .0200	.060 (3x)	4	1/8	1-1/2	875420-C6	41.20
.020 .0200	.080 (4x)	3	1/8	2-1/2	886220-C6	44.50
.020 .0200	.100 (5x)	3	1/8	2-1/2	990720-C6	46.70
.020 .0200	.100 (5x)	4	1/8	2-1/2	852920-C6	48.60
.6 mm .0236	1.80 mm (3x)	3	4 mm	50 mm	942813-C6	42.00
.025 .0250	.038 (1.5x)	3	1/8	1-1/2	973725-C6	38.30
.025 .0250	.075 (3x)	3	1/8	1-1/2	967025-C6	37.90
.025 .0250	.075 (3x)	4	1/8	1-1/2	875425-C6	39.70
.025 .0250	.100 (4x)	3	1/8	2-1/2	886225-C6	45.10
.025 .0250	.125 (5x)	3	1/8	2-1/2	990725-C6	45.10
.030 .0300	.024 (0.8x)	3	1/8	1-1/2	888030-C6	37.40
.030 .0300	.045 (1.5x)	3	1/8	1-1/2	973730-C6	38.30
.030 .0300	.045 (1.5x)	4	1/8	1-1/2	841630-C6	40.20
.030 .0300	.090 (3x)	3	1/8	1-1/2	967030-C6	37.90
.030 .0300	.090 (3x)	4	1/8	1-1/2	875430-C6	39.70
.030 .0300	.125 (4x)	3	1/8	2-1/2	886230-C6	45.10
.030 .0300	.156 (5x)	3	1/8	2-1/2	990730-C6	45.10

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Square (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" - .0005" +.00mm - .02mm decimal equivalent			L ₂ +.010" - .000" +.25mm - .00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.031 (1/32)	.0310		.025 (0.8x)	3	1/8	1-1/2	888031-C6	34.10
.031 (1/32)	.0310		.047 (1.5x)	3	1/8	1-1/2	973731-C6	32.70
.031 (1/32)	.0310		.047 (1.5x)	4	1/8	1-1/2	841631-C6	34.20
.031 (1/32)	.0310		.093 (3x)	3	1/8	1-1/2	967031-C6	32.30
.031 (1/32)	.0310		.093 (3x)	4	1/8	1-1/2	875431-C6	34.20
.031 (1/32)	.0310		.125 (4x)	3	1/8	2-1/2	886231-C6	38.80
.031 (1/32)	.0310		.156 (5x)	3	1/8	2-1/2	990731-C6	41.00
.031 (1/32)	.0310		.156 (5x)	4	1/8	2-1/2	852931-C6	42.80
.8 mm	.0314		2.40 mm (3x)	3	4 mm	50 mm	942818-C6	36.40
.8 mm	.0314		4.00 mm (5x)	3	4 mm	50 mm	910518-C6	38.30
.035	.0350		.028 (0.8x)	3	1/8	1-1/2	888035-C6	32.90
.035	.0350		.053 (1.5x)	3	1/8	1-1/2	973735-C6	32.70
.035	.0350		.053 (1.5x)	4	1/8	1-1/2	841635-C6	34.60
.035	.0350		.105 (3x)	3	1/8	1-1/2	967035-C6	32.30
.035	.0350		.105 (3x)	4	1/8	1-1/2	875435-C6	34.20
.035	.0350		.140 (4x)	3	1/8	2-1/2	886235-C6	38.80
.035	.0350		.187 (5x)	3	1/8	2-1/2	990735-C6	41.00
1.0 mm	.0393		.80 mm (0.8x)	3	4 mm	50 mm	848022-C6	37.20
1.0 mm	.0393		1.50 mm (1.5x)	3	4 mm	50 mm	954522-C6	37.10
1.0 mm	.0393		3.00 mm (3x)	3	4 mm	50 mm	942822-C6	36.40
1.0 mm	.0393		3.00 mm (3x)	4	4 mm	50 mm	821322-C6	38.30
1.0 mm	.0393		4.00 mm (4x)	3	4 mm	50 mm	820722-C6	41.10
1.0 mm	.0393		5.00 mm (5x)	3	4 mm	50 mm	910522-C6	45.00
.039	.0390		.117 (3x)	3	1/8	1-1/2	967039-C6	33.80 NEW
.040	.0400		.032 (0.8x)	3	1/8	1-1/2	888040-C6	32.90
.040	.0400		.060 (1.5x)	3	1/8	1-1/2	973740-C6	32.70
.040	.0400		.060 (1.5x)	4	1/8	1-1/2	841640-C6	34.60
.040	.0400		.120 (3x)	3	1/8	1-1/2	967040-C6	32.30
.040	.0400		.120 (3x)	4	1/8	1-1/2	875440-C6	34.20
.040	.0400		.160 (4x)	3	1/8	2-1/2	886240-C6	39.00
.040	.0400		.203 (5x)	3	1/8	2-1/2	990740-C6	41.00
.040	.0400		.203 (5x)	4	1/8	2-1/2	852940-C6	42.90 NEW
.045	.0450		.068 (1.5x)	3	1/8	1-1/2	973745-C6	32.70
.045	.0450		.135 (3x)	3	1/8	1-1/2	967045-C6	32.30
.045	.0450		.135 (3x)	4	1/8	1-1/2	875445-C6	34.20
.045	.0450		.225 (5x)	3	1/8	2-1/2	990745-C6	41.00
.047 (3/64)	.0470		.038 (0.8x)	3	1/8	1-1/2	888047-C6	35.70
.047 (3/64)	.0470		.071 (1.5x)	3	1/8	1-1/2	973747-C6	32.70
.047 (3/64)	.0470		.071 (1.5x)	4	1/8	1-1/2	841647-C6	34.40
.047 (3/64)	.0470		.141 (3x)	3	1/8	1-1/2	967047-C6	32.30
.047 (3/64)	.0470		.141 (3x)	4	1/8	1-1/2	875447-C6	34.20
.047 (3/64)	.0470		.187 (4x)	3	1/8	2-1/2	886247-C6	38.80
.047 (3/64)	.0470		.250 (5x)	3	1/8	2-1/2	990747-C6	41.00
.047 (3/64)	.0470		.250 (5x)	4	1/8	2-1/2	852947-C6	42.80
1.2 mm	.0472		3.50 mm (3x)	3	4 mm	50 mm	942827-C6	36.40

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

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NEW

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm	decimal equivalent	+ .010" / - .000" / + .25 mm / - .00 mm					
.050		.0500	.040 (0.8x)	3	1/8	1-1/2	888050-C6	31.90
.050		.0500	.075 (1.5x)	3	1/8	1-1/2	973750-C6	32.70
.050		.0500	.150 (3x)	3	1/8	1-1/2	967050-C6	32.30
.050		.0500	.150 (3x)	4	1/8	1-1/2	875450-C6	34.20
.050		.0500	.203 (4x)	3	1/8	1-1/2	886250-C6	38.80
.050		.0500	.250 (5x)	3	1/8	2-1/2	990750-C6	41.00
.055		.0550	.083 (1.5x)	3	1/8	1-1/2	973755-C6	32.70
.055		.0550	.165 (3x)	3	1/8	1-1/2	967055-C6	32.30
.055		.0550	.165 (3x)	4	1/8	1-1/2	875455-C6	34.20
.055		.0550	.275 (5x)	3	1/8	2-1/2	990755-C6	41.00
1.4 mm	.0551		4.00 mm (3x)	3	4 mm	50 mm	942831-C6	34.20
1.5 mm	.0590		2.20 mm (1.5x)	3	4 mm	50 mm	954533-C6	34.80
1.5 mm	.0590		4.50 mm (3x)	3	4 mm	50 mm	942833-C6	34.20
1.5 mm	.0590		4.50 mm (3x)	4	4 mm	50 mm	821333-C6	36.10
1.5 mm	.0590		7.50 mm (5x)	3	4 mm	50 mm	910533-C6	43.10
.060		.0600	.048 (0.8x)	3	1/8	1-1/2	888060-C6	31.90
.060		.0600	.090 (1.5x)	3	1/8	1-1/2	973760-C6	32.70
.060		.0600	.180 (3x)	3	1/8	1-1/2	967060-C6	32.30
.060		.0600	.180 (3x)	4	1/8	1-1/2	875460-C6	34.20
.060		.0600	.312 (5x)	3	1/8	2-1/2	990760-C6	41.00
.062 (1/16)	.0620		.050 (0.8x)	3	1/8	1-1/2	888062-C6	33.60
.062 (1/16)	.0620		.050 (0.8x)	4	1/8	1-1/2	790562-C6	35.40
.062 (1/16)	.0620		.093 (1.5x)	3	1/8	1-1/2	973762-C6	30.50
.062 (1/16)	.0620		.093 (1.5x)	4	1/8	1-1/2	841662-C6	32.20
.062 (1/16)	.0620		.186 (3x)	3	1/8	1-1/2	967062-C6	30.20
.062 (1/16)	.0620		.186 (3x)	4	1/8	1-1/2	875462-C6	32.10
.062 (1/16)	.0620		.250 (4x)	3	1/8	2-1/2	886262-C6	37.20
.062 (1/16)	.0620		.250 (4x)	4	1/8	2-1/2	790762-C6	39.10
.062 (1/16)	.0620		.312 (5x)	3	1/8	2-1/2	990762-C6	39.30
.062 (1/16)	.0620		.312 (5x)	4	1/8	2-1/2	852962-C6	41.20
1.6 mm	.0629		5.00 mm (3x)	3	4 mm	50 mm	942836-C6	34.90
.065	.0650		.195 (3x)	3	1/8	1-1/2	967065-C6	34.80
.070	.0700		.105 (1.5x)	3	1/8	1-1/2	973770-C6	30.50
.070	.0700		.210 (3x)	3	1/8	1-1/2	967070-C6	30.20
.070	.0700		.210 (3x)	4	1/8	1-1/2	875470-C6	32.10
.070	.0700		.375 (5x)	3	1/8	2-1/2	990770-C6	39.30
1.8 mm	.0708		5.50 mm (3x)	3	4 mm	50 mm	942840-C6	34.90
.075	.0750		.225 (3x)	3	1/8	1-1/2	967075-C6	34.80
.078 (5/64)	.0780		.062 (0.8x)	3	1/8	1-1/2	888078-C6	33.60
.078 (5/64)	.0780		.118 (1.5x)	3	1/8	1-1/2	973778-C6	30.50
.078 (5/64)	.0780		.118 (1.5x)	4	1/8	1-1/2	841678-C6	32.20
.078 (5/64)	.0780		.234 (3x)	3	1/8	1-1/2	967078-C6	30.20
.078 (5/64)	.0780		.234 (3x)	4	1/8	1-1/2	875478-C6	32.10
.078 (5/64)	.0780		.312 (4x)	3	1/8	2-1/2	886278-C6	37.20
.078 (5/64)	.0780		.406 (5x)	3	1/8	2-1/2	990778-C6	39.30
.078 (5/64)	.0780		.406 (5x)	4	1/8	2-1/2	852978-C6	41.20

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HIGH TEMP ALLOYS

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" -.0005"	+ .00mm -.02mm	decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
2.0 mm	.0787		3.00 mm (1.5x)	3	4 mm	50 mm	954545-C6	34.80
2.0 mm	.0787		6.00 mm (3x)	3	4 mm	50 mm	942845-C6	34.20
2.0 mm	.0787		6.00 mm (3x)	4	4 mm	50 mm	821345-C6	36.10
2.0 mm	.0787		10.00 mm (5x)	3	4 mm	50 mm	910545-C6	43.10
.080	.0800		.120 (1.5x)	3	1/8	1-1/2	973780-C6	30.50
.080	.0800		.240 (3x)	3	1/8	1-1/2	967080-C6	30.20
.080	.0800		.406 (5x)	3	1/8	2-1/2	990780-C6	39.30
.085	.0850		.255 (3x)	3	1/8	1-1/2	967085-C6	34.80
.090	.0900		.135 (1.5x)	3	1/8	1-1/2	973790-C6	30.50
.090	.0900		.135 (1.5x)	4	1/8	1-1/2	841690-C6	32.20
.090	.0900		.270 (3x)	3	1/8	1-1/2	967090-C6	30.20
.090	.0900		.450 (5x)	3	1/8	2-1/2	990790-C6	39.30
.093 (3/32)	.0930		.074 (0.8x)	3	1/8	1-1/2	888093-C6	33.60
.093 (3/32)	.0930		.074 (0.8x)	4	1/8	1-1/2	790593-C6	35.50 NEW
.093 (3/32)	.0930		.140 (1.5x)	3	1/8	1-1/2	973793-C6	30.50
.093 (3/32)	.0930		.140 (1.5x)	4	1/8	1-1/2	841693-C6	32.20
.093 (3/32)	.0930		.279 (3x)	3	1/8	1-1/2	967093-C6	30.20
.093 (3/32)	.0930		.279 (3x)	4	1/8	1-1/2	875493-C6	32.10
.093 (3/32)	.0930		.375 (4x)	3	1/8	2-1/2	886293-C6	37.20
.093 (3/32)	.0930		.375 (4x)	4	1/8	2-1/2	790793-C6	39.10
.093 (3/32)	.0930		.500 (5x)	3	1/8	2-1/2	990793-C6	39.30
.093 (3/32)	.0930		.500 (5x)	4	1/8	2-1/2	852993-C6	41.20
.095	.0950		.285 (3x)	3	1/8	1-1/2	967095-C6	34.00
2.5 mm	.0984		3.70 mm (1.5x)	3	4 mm	50 mm	954551-C6	34.80
2.5 mm	.0984		7.50 mm (3x)	3	4 mm	50 mm	942851-C6	34.20
2.5 mm	.0984		7.50 mm (3x)	4	4 mm	50 mm	821351-C6	36.10
2.5 mm	.0984		12.00 mm (5x)	3	4 mm	50 mm	910551-C6	43.10
.100	.1000		.150 (1.5x)	3	1/8	1-1/2	973800-C6	30.50
.100	.1000		.300 (3x)	3	1/8	1-1/2	967100-C6	30.20
.100	.1000		.500 (5x)	3	1/8	2-1/2	990800-C6	39.30
.109 (7/64)	.1090		.164 (1.5x)	3	1/8	1-1/2	973802-C6	30.50
.109 (7/64)	.1090		.327 (3x)	3	1/8	1-1/2	967102-C6	30.20
.109 (7/64)	.1090		.327 (3x)	4	1/8	1-1/2	875502-C6	32.10
.109 (7/64)	.1090		.570 (5x)	3	1/8	2-1/2	990802-C6	39.30
.118	.1180		.354 (3x)	3	1/8	1-1/2	967105-C6	32.20 NEW
3.0 mm	.1181		2.40 mm (0.8x)	3	4 mm	50 mm	848057-C6	34.70
3.0 mm	.1181		4.50 mm (1.5x)	3	4 mm	50 mm	954557-C6	34.80
3.0 mm	.1181		9.00 mm (3x)	3	4 mm	50 mm	942857-C6	34.20
3.0 mm	.1181		15.00 mm (5x)	3	4 mm	50 mm	910557-C6	43.10

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

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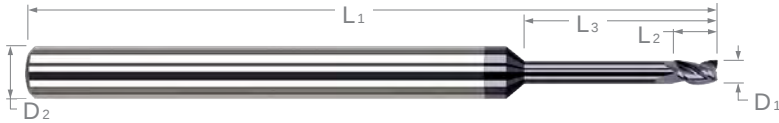
	CUTTER DIAMETER		LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
	D ₁ +.000" -.002" +.00mm -.04mm decimal equivalent		L ₂ +.030" -.000" +.75mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
NEW	.125 (1/8)	.1250	.100 (0.8x)	4	1/8	1-1/2	888108-C6	33.60
	.125 (1/8)	.1250	.187 (1.5x)	4	1/8	1-1/2	973808-C6	28.70
	.125 (1/8)	.1250	.187 (1.5x)	5	1/8	1-1/2	747108-C6	30.60
NEW	.125 (1/8)	.1250	.375 (3x)	4	1/8	1-1/2	967108-C6	28.70
	.125 (1/8)	.1250	.375 (3x)	5	1/8	1-1/2	747308-C6	30.60
	.125 (1/8)	.1250	.500 (4x)	4	1/8	2-1/2	886308-C6	37.20
	.125 (1/8)	.1250	.625 (5x)	4	1/8	2-1/2	990808-C6	39.30
	.140 (9/64)	.1406	.220 (1.5x)	4	3/16	2	973809-C6	32.90
	.140 (9/64)	.1406	.425 (3x)	4	3/16	2	967109-C6	32.90
	.140 (9/64)	.1406	.750 (5x)	4	3/16	3	990809-C6	41.70
	.156 (5/32)	.1562	.125 (0.8x)	4	3/16	2	888110-C6	32.30
	.156 (5/32)	.1562	.235 (1.5x)	4	3/16	2	973810-C6	32.90
	.156 (5/32)	.1562	.470 (3x)	4	3/16	2	967110-C6	32.90
	.156 (5/32)	.1562	.625 (4x)	4	3/16	3	886310-C6	34.80
	.156 (5/32)	.1562	.750 (5x)	4	3/16	3	990810-C6	41.70
	4.0 mm	.1574	12.00 mm (3x)	4	6 mm	63 mm	942861-C6	43.20
	.172 (11/64)	.1718	.505 (3x)	4	3/16	2	967111-C6	34.80
	.187 (3/16)	.1875	.150 (0.8x)	4	3/16	2	888112-C6	36.20
	.187 (3/16)	.1875	.285 (1.5x)	4	3/16	2	973812-C6	31.20
NEW	.187 (3/16)	.1875	.285 (1.5x)	5	3/16	2	747112-C6	33.10
	.187 (3/16)	.1875	.562 (3x)	4	3/16	2	967112-C6	31.20
NEW	.187 (3/16)	.1875	.562 (3x)	5	3/16	2	747312-C6	33.10
	.187 (3/16)	.1875	.750 (4x)	4	3/16	3	886312-C6	39.90
	.187 (3/16)	.1875	1.000 (5x)	4	3/16	3	990812-C6	41.70
NEW	5.0 mm	.1968	15.00 mm (3x)	4	6 mm	63 mm	821364-C6	43.20
	.218 (7/32)	.2187	.330 (1.5x)	4	1/4	2-1/2	973814-C6	43.00
	.218 (7/32)	.2187	.660 (3x)	4	1/4	2-1/2	967114-C6	43.00
	6.0 mm	.2362	18.00 mm (3x)	4	6 mm	63 mm	942866-C6	43.20
	.250 (1/4)	.2500	.200 (0.8x)	4	1/4	2-1/2	888116-C6	44.40
	.250 (1/4)	.2500	.375 (1.5x)	4	1/4	2-1/2	973816-C6	39.10
NEW	.250 (1/4)	.2500	.375 (1.5x)	5	1/4	2-1/2	747116-C6	41.00
	.250 (1/4)	.2500	.750 (3x)	4	1/4	2-1/2	967116-C6	39.10
NEW	.250 (1/4)	.2500	.750 (3x)	5	1/4	2-1/2	747316-C6	41.00
	.250 (1/4)	.2500	1.000 (4x)	4	1/4	4	886316-C6	48.00
	.250 (1/4)	.2500	1.250 (5x)	4	1/4	4	990816-C6	49.90
	.312 (5/16)	.3125	1.000 (3x)	4	5/16	2-1/2	967120-C6	54.50
	.375 (3/8)	.3750	.570 (1.5x)	4	3/8	2-1/2	973824-C6	63.10
	.375 (3/8)	.3750	1.125 (3x)	4	3/8	2-1/2	967124-C6	63.10
	10.0 mm	.3937	30.0 mm (3x)	4	10 mm	75 mm	942873-C6	68.70
	.500 (1/2)	.5000	.750 (1.5x)	4	1/2	3	973832-C6	81.50
	.500 (1/2)	.5000	1.500 (3x)	4	1/2	3	967132-C6	81.50

HIGH TEMP ALLOYS

PLEASE SEE SPEEDS & FEEDS ON PAGE 139

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Square – Long Reach, Stub Flute



- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 34°) reduces chatter and harmonics and increases material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- Suitable for steels up to 45Rc
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00mm - .02mm	decimal equivalent	+ .010" - .000" + .25mm - .00mm	+ .010" - .000" + .25mm - .00mm					
.010	.0100	.0100	.015	.050 (5x)	3	1/8	2-1/2	985310-C6	67.30
.010	.0100	.0100	.015	.080 (8x)	3	1/8	2-1/2	978210-C6	68.60
.015 (1/64)	.0150	.0150	.023	.078 (5x)	3	1/8	2-1/2	985315-C6	58.10
.015 (1/64)	.0150	.0150	.023	.125 (8x)	3	1/8	2-1/2	978215-C6	59.20
.020	.0200	.0200	.030	.060 (3x)	3	1/8	1-1/2	940520-C6	54.40
.020	.0200	.0200	.030	.100 (5x)	3	1/8	2-1/2	985320-C6	55.60
.020	.0200	.0200	.030	.100 (5x)	4	1/8	2-1/2	791320-C6	57.60
.020	.0200	.0200	.030	.120 (6x)	3	1/8	2-1/2	895520-C6	55.60
.020	.0200	.0200	.030	.140 (7x)	3	1/8	2-1/2	880720-C6	56.70
.020	.0200	.0200	.030	.160 (8x)	3	1/8	2-1/2	978220-C6	56.70
.020	.0200	.0200	.030	.200 (10x)	3	1/8	2-1/2	935720-C6	62.00
.025	.0250	.0250	.038	.125 (5x)	3	1/8	2-1/2	985325-C6	55.60
.025	.0250	.0250	.038	.203 (8x)	3	1/8	2-1/2	978225-C6	56.70
.030	.0300	.0300	.045	.156 (5x)	3	1/8	2-1/2	985330-C6	55.60
.030	.0300	.0300	.045	.250 (8x)	3	1/8	2-1/2	978230-C6	56.70
.031 (1/32)	.0310	.0310	.047	.093 (3x)	3	1/8	1-1/2	940531-C6	50.40
.031 (1/32)	.0310	.0310	.047	.156 (5x)	3	1/8	2-1/2	985331-C6	51.50
.031 (1/32)	.0310	.0310	.047	.187 (6x)	3	1/8	2-1/2	895531-C6	51.50
.031 (1/32)	.0310	.0310	.047	.218 (7x)	3	1/8	2-1/2	880731-C6	52.70
.031 (1/32)	.0310	.0310	.047	.250 (8x)	3	1/8	2-1/2	978231-C6	52.70
.031 (1/32)	.0310	.0310	.047	.250 (8x)	4	1/8	2-1/2	812331-C6	54.70
.031 (1/32)	.0310	.0310	.047	.312 (10x)	3	1/8	2-1/2	935731-C6	57.80
.031 (1/32)	.0310	.0310	.047	.375 (12x)	3	1/8	2-1/2	901331-C6	59.60
.031 (1/32)	.0310	.0310	.047	.470 (15x)	3	1/8	2-1/2	851531-C6	60.80
.035	.0350	.0350	.053	.187 (5x)	3	1/8	2-1/2	985335-C6	50.40
1.0 mm	.0393	.0393	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	905022-C6	56.70
1.0 mm	.0393	.0393	1.50 mm	8.0 mm (8x)	3	4 mm	50 mm	911422-C6	57.00
.040	.0400	.0400	.060	.203 (5x)	3	1/8	2-1/2	985340-C6	50.40
.040	.0400	.0400	.060	.325 (8x)	3	1/8	2-1/2	978240-C6	51.50
.045	.0450	.0450	.068	.225 (5x)	3	1/8	2-1/2	985345-C6	50.40

continued on next page

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Square – Long Reach, Stub Flute (cont.)



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	CUTTER DIAMETER		LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
	D ₁ +.0005" -.0005"	+.00mm -.02mm decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm	L ₃ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
NEW	.047 (3/64)	.0470	.071	.250 (5x)	3	1/8	2-1/2	985347-C6	50.40
	.047 (3/64)	.0470	.071	.250 (5x)	4	1/8	2-1/2	791347-C6	52.40
	.047 (3/64)	.0470	.071	.281 (6x)	3	1/8	2-1/2	895547-C6	50.40
	.047 (3/64)	.0470	.071	.328 (7x)	3	1/8	2-1/2	880747-C6	51.50
	.047 (3/64)	.0470	.071	.375 (8x)	3	1/8	2-1/2	978247-C6	51.50
	.047 (3/64)	.0470	.071	.375 (8x)	4	1/8	2-1/2	812347-C6	53.50
	.047 (3/64)	.0470	.071	.480 (10x)	3	1/8	2-1/2	935747-C6	56.20
	.050	.0500	.075	.250 (5x)	3	1/8	2-1/2	985350-C6	50.40
	.055	.0550	.083	.275 (5x)	3	1/8	2-1/2	985355-C6	50.40
	.060	.0600	.090	.312 (5x)	3	1/8	2-1/2	985360-C6	50.40
	.060	.0600	.090	.500 (8x)	3	1/8	2-1/2	978260-C6	51.50
	.062 (1/16)	.0620	.093	.186 (3x)	3	1/8	1-1/2	940562-C6	50.40
	.062 (1/16)	.0620	.093	.312 (5x)	3	1/8	2-1/2	985362-C6	51.50
	.062 (1/16)	.0620	.093	.312 (5x)	4	1/8	2-1/2	791362-C6	53.50
	.062 (1/16)	.0620	.093	.375 (6x)	3	1/8	2-1/2	895562-C6	51.50
	.062 (1/16)	.0620	.093	.437 (7x)	3	1/8	2-1/2	880762-C6	52.70
	.062 (1/16)	.0620	.093	.500 (8x)	3	1/8	2-1/2	978262-C6	52.70
	.062 (1/16)	.0620	.093	.500 (8x)	4	1/8	2-1/2	812362-C6	54.70
	.062 (1/16)	.0620	.093	.625 (10x)	3	1/8	2-1/2	935762-C6	57.80
	.062 (1/16)	.0620	.093	.750 (12x)	3	1/8	2-1/2	901362-C6	59.60
	.062 (1/16)	.0620	.093	.950 (15x)	3	1/8	2-1/2	851562-C6	60.80
NEW	.070	.0700	.105	.375 (5x)	3	1/8	2-1/2	985370-C6	54.60
	.078 (5/64)	.0780	.118	.406 (5x)	3	1/8	2-1/2	985378-C6	50.40
	.078 (5/64)	.0780	.118	.625 (8x)	3	1/8	2-1/2	978278-C6	51.50
	.078 (5/64)	.0780	.118	.625 (8x)	4	1/8	2-1/2	812378-C6	53.50
	.078 (5/64)	.0780	.118	.800 (10x)	3	1/8	2-1/2	935778-C6	56.20
	2.0 mm	.0787	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	905045-C6	57.50
	2.0 mm	.0787	3.00 mm	16.0 mm (8x)	3	4 mm	50 mm	911445-C6	58.10
	.080	.0800	.120	.406 (5x)	3	1/8	2-1/2	985380-C6	54.60
	.090	.0900	.135	.450 (5x)	3	1/8	2-1/2	985390-C6	54.60
	.093 (3/32)	.0930	.140	.279 (3x)	3	1/8	1-1/2	940593-C6	50.40
	.093 (3/32)	.0930	.140	.500 (5x)	3	1/8	2-1/2	985393-C6	51.50
	.093 (3/32)	.0930	.140	.500 (5x)	4	1/8	2-1/2	791393-C6	53.50
	.093 (3/32)	.0930	.140	.585 (6x)	3	1/8	2-1/2	895593-C6	51.50
	.093 (3/32)	.0930	.140	.670 (7x)	3	1/8	2-1/2	880793-C6	52.70
	.093 (3/32)	.0930	.140	.750 (8x)	3	1/8	2-1/2	978293-C6	52.70
	.093 (3/32)	.0930	.140	.750 (8x)	4	1/8	2-1/2	812393-C6	54.70
	.093 (3/32)	.0930	.140	.950 (10x)	3	1/8	2-1/2	935793-C6	57.80
	.093 (3/32)	.0930	.140	1.125 (12x)	3	1/8	2-1/2	901393-C6	59.60
	.093 (3/32)	.0930	.140	1.400 (15x)	3	1/8	3	851593-C6	60.80
	.100	.1000	.150	.500 (5x)	3	1/8	2-1/2	985400-C6	50.40
	.100	.1000	.150	.800 (8x)	3	1/8	2-1/2	978300-C6	51.50
	.109 (7/64)	.1090	.164	.570 (5x)	3	1/8	2-1/2	985402-C6	50.40
	.109 (7/64)	.1090	.164	.900 (8x)	3	1/8	2-1/2	978302-C6	51.50
	3.0 mm	.1181	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	905057-C6	52.30
	3.0 mm	.1181	4.50 mm	24.0 mm (8x)	3	4 mm	50 mm	911457-C6	52.50

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Square – Long Reach, Stub Flute (cont.)



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HIGH TEMP ALLOYS

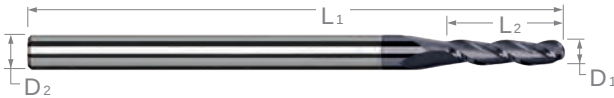
CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁								TOOL #	PRICE
+ .000" / - .002"	+ .00mm / - .04mm	decimal equivalent	L ₂ + .030" / - .000" / + .75mm / - .00mm	L ₃ + .030" / - .000" / + .75mm / - .00mm		D ₂ (h6)	L ₁		
.125 (1/8)	.1250	.1250	.187	.375 (3x)	4	1/8	1-1/2	940608-C6	50.40
.125 (1/8)	.1250	.1250	.187	.625 (5x)	4	1/8	2-1/2	985408-C6	51.50
.125 (1/8)	.1250	.1250	.187	.750 (6x)	4	1/8	2-1/2	895608-C6	51.50
.125 (1/8)	.1250	.1250	.187	.875 (7x)	4	1/8	2-1/2	880808-C6	52.70
.125 (1/8)	.1250	.1250	.187	1.000 (8x)	4	1/8	2-1/2	978308-C6	52.70
.125 (1/8)	.1250	.1250	.187	1.250 (10x)	4	1/8	2-1/2	935808-C6	57.80
.125 (1/8)	.1250	.1250	.187	1.500 (12x)	4	1/8	3	901408-C6	61.60
.140 (9/64)	.1406	.1406	.220	.750 (5x)	4	3/16	3	985409-C6	58.90
.156 (5/32)	.1562	.1562	.235	.750 (5x)	4	3/16	3	985410-C6	55.60
.156 (5/32)	.1562	.1562	.235	1.250 (8x)	4	3/16	3	978310-C6	56.70
.156 (5/32)	.1562	.1562	.235	1.570 (10x)	4	3/16	3	935810-C6	61.60
.187 (3/16)	.1875	.1875	.285	1.000 (5x)	4	3/16	3	985412-C6	55.60
.187 (3/16)	.1875	.1875	.285	1.500 (8x)	4	3/16	3	978312-C6	56.70
.187 (3/16)	.1875	.1875	.285	1.875 (10x)	4	3/16	4	935812-C6	61.60
6.0 mm	.2362	.2362	9.00mm	30.0mm (5x)	4	6 mm	63 mm	905066-C6	65.80
.250 (1/4)	.2500	.2500	.375	1.250 (5x)	4	1/4	4	985416-C6	62.00
.250 (1/4)	.2500	.2500	.375	2.000 (8x)	4	1/4	4	978316-C6	63.40
.375 (3/8)	.3750	.3750	.570	2.000 (5x)	4	3/8	4	985424-C6	70.60

PLEASE SEE SPEEDS & FEEDS ON PAGE 131

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball

HIGH TEMP ALLOYS



- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design (approx. 34°) reduces chatter and harmonics and increases material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- Suitable for steels up to 45Rc
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁ +.0005" -.0005" +.00mm -.02mm decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.2 mm .0078	.60 mm (3x)	3	4 mm	50 mm	975304-C6	66.10
.010 .0100	.015 (1.5x)	3	1/8	1-1/2	944210-C6	62.00
.010 .0100	.030 (3x)	3	1/8	1-1/2	970510-C6	62.00
.010 .0100	.050 (5x)	3	1/8	2-1/2	930610-C6	71.80
.015 (1/64) .0150	.023 (1.5x)	3	1/8	1-1/2	944215-C6	52.70
.015 (1/64) .0150	.045 (3x)	3	1/8	1-1/2	970515-C6	52.70
.015 (1/64) .0150	.078 (5x)	3	1/8	2-1/2	930615-C6	62.20
.4 mm .0157	1.20 mm (3x)	3	4 mm	50 mm	975309-C6	54.60
.5 mm .0196	1.50 mm (3x)	3	4 mm	50 mm	975311-C6	49.60
.020 .0200	.016 (0.8x)	3	1/8	1-1/2	848120-C6	47.90
.020 .0200	.030 (1.5x)	3	1/8	1-1/2	944220-C6	47.10
.020 .0200	.060 (3x)	3	1/8	1-1/2	970520-C6	47.10
.020 .0200	.060 (3x)	4	1/8	1-1/2	893020-C6	49.40
.020 .0200	.080 (4x)	3	1/8	2-1/2	811220-C6	51.80
.020 .0200	.100 (5x)	3	1/8	2-1/2	930620-C6	51.80
.6 mm .0236	1.80 mm (3x)	3	4 mm	50 mm	975313-C6	48.10
.025 .0250	.038 (1.5x)	3	1/8	1-1/2	944225-C6	45.60
.025 .0250	.075 (3x)	3	1/8	1-1/2	970525-C6	45.60
.025 .0250	.125 (5x)	3	1/8	2-1/2	930625-C6	50.40
.030 .0300	.045 (1.5x)	3	1/8	1-1/2	944230-C6	40.30
.030 .0300	.090 (3x)	3	1/8	1-1/2	970530-C6	40.30
.030 .0300	.156 (5x)	3	1/8	2-1/2	930630-C6	45.00
.031 (1/32) .0310	.025 (0.8x)	3	1/8	1-1/2	848131-C6	41.20
.031 (1/32) .0310	.047 (1.5x)	3	1/8	1-1/2	944231-C6	40.10
.031 (1/32) .0310	.047 (1.5x)	4	1/8	1-1/2	814531-C6	42.40
.031 (1/32) .0310	.093 (3x)	3	1/8	1-1/2	970531-C6	40.10
.031 (1/32) .0310	.093 (3x)	4	1/8	1-1/2	893031-C6	42.40
.031 (1/32) .0310	.125 (4x)	3	1/8	2-1/2	811231-C6	48.50
.031 (1/32) .0310	.156 (5x)	3	1/8	2-1/2	930631-C6	48.50
.8 mm .0314	1.20 mm (1.5x)	3	4 mm	50 mm	968018-C6	42.20
.8 mm .0314	2.40 mm (3x)	3	4 mm	50 mm	975318-C6	42.20
.035 .0350	.105 (3x)	3	1/8	1-1/2	970535-C6	40.30
1.0 mm .0393	.80 mm (0.8x)	3	4 mm	50 mm	872422-C6	42.80
1.0 mm .0393	1.50 mm (1.5x)	3	4 mm	50 mm	968022-C6	42.20
1.0 mm .0393	3.00 mm (3x)	3	4 mm	50 mm	975322-C6	42.20
1.0 mm .0393	3.00 mm (3x)	4	4 mm	50 mm	793822-C6	44.60
1.0 mm .0393	4.00 mm (4x)	3	4 mm	50 mm	790122-C6	50.60
1.0 mm .0393	5.00 mm (5x)	3	4 mm	50 mm	911322-C6	50.60

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm	decimal equivalent	+ .010" / - .000" / + .25 mm / - .00 mm					
.040		.0400	.060 (1.5x)	3	1/8	1-1/2	944240-C6	40.10
.040		.0400	.060 (1.5x)	4	1/8	1-1/2	814540-C6	42.40
.040		.0400	.120 (3x)	3	1/8	1-1/2	970540-C6	40.10
.040		.0400	.120 (3x)	4	1/8	1-1/2	893040-C6	42.40
.040		.0400	.160 (4x)	3	1/8	2-1/2	811240-C6	48.70
.040		.0400	.203 (5x)	3	1/8	2-1/2	930640-C6	48.70
.045		.0450	.135 (3x)	3	1/8	1-1/2	970545-C6	40.30
.047 (3/64)		.0470	.038 (0.8x)	3	1/8	1-1/2	848147-C6	40.40
.047 (3/64)		.0470	.071 (1.5x)	3	1/8	1-1/2	944247-C6	40.10
.047 (3/64)		.0470	.141 (3x)	3	1/8	1-1/2	970547-C6	40.10
.047 (3/64)		.0470	.141 (3x)	4	1/8	1-1/2	893047-C6	42.40
.047 (3/64)		.0470	.250 (5x)	3	1/8	2-1/2	930647-C6	48.70
1.2 mm		.0472	1.80 mm (1.5x)	3	4 mm	50 mm	968027-C6	42.20
1.2 mm		.0472	3.50 mm (3x)	3	4 mm	50 mm	975327-C6	42.20
.050		.0500	.075 (1.5x)	3	1/8	1-1/2	944250-C6	40.10
.050		.0500	.150 (3x)	3	1/8	1-1/2	970550-C6	40.10
.050		.0500	.250 (5x)	3	1/8	2-1/2	930650-C6	48.70
.055		.0550	.165 (3x)	3	1/8	1-1/2	970555-C6	40.30
1.4 mm		.0551	2.10 mm (1.5x)	3	4 mm	50 mm	968031-C6	42.20
1.4 mm		.0551	4.00 mm (3x)	3	4 mm	50 mm	975331-C6	42.20
1.5 mm		.0590	2.20 mm (1.5x)	3	4 mm	50 mm	968033-C6	42.20
1.5 mm		.0590	4.50 mm (3x)	3	4 mm	50 mm	975333-C6	42.20
1.5 mm		.0590	7.50 mm (5x)	3	4 mm	50 mm	911333-C6	50.60
.060		.0600	.090 (1.5x)	3	1/8	1-1/2	944260-C6	40.10
.060		.0600	.180 (3x)	3	1/8	1-1/2	970560-C6	40.10
.060		.0600	.312 (5x)	3	1/8	2-1/2	930660-C6	48.70
.062 (1/16)		.0620	.050 (0.8x)	3	1/8	1-1/2	848162-C6	38.90
.062 (1/16)		.0620	.050 (0.8x)	4	1/8	1-1/2	787162-C6	41.20
.062 (1/16)		.0620	.093 (1.5x)	3	1/8	1-1/2	944262-C6	37.80
.062 (1/16)		.0620	.093 (1.5x)	4	1/8	1-1/2	814562-C6	40.10
.062 (1/16)		.0620	.186 (3x)	3	1/8	1-1/2	970562-C6	37.80
.062 (1/16)		.0620	.186 (3x)	4	1/8	1-1/2	893062-C6	40.10
.062 (1/16)		.0620	.250 (4x)	3	1/8	2-1/2	811262-C6	46.50
.062 (1/16)		.0620	.312 (5x)	3	1/8	2-1/2	930662-C6	46.50
.062 (1/16)		.0620	.312 (5x)	4	1/8	2-1/2	778862-C6	48.80
1.6 mm		.0629	2.40 mm (1.5x)	3	4 mm	50 mm	968036-C6	39.70
1.6 mm		.0629	5.00 mm (3x)	3	4 mm	50 mm	975336-C6	39.70
.070		.0700	.105 (1.5x)	3	1/8	1-1/2	944270-C6	38.30
.070		.0700	.210 (3x)	3	1/8	1-1/2	970570-C6	38.30
.070		.0700	.210 (3x)	4	1/8	1-1/2	893070-C6	40.60
.070		.0700	.375 (5x)	3	1/8	2-1/2	930670-C6	45.50
1.8 mm		.0708	2.70 mm (1.5x)	3	4 mm	50 mm	968040-C6	39.70
1.8 mm		.0708	5.50 mm (3x)	3	4 mm	50 mm	975340-C6	39.70
.078 (5/64)		.0780	.062 (0.8x)	3	1/8	1-1/2	848178-C6	38.90
.078 (5/64)		.0780	.118 (1.5x)	3	1/8	1-1/2	944278-C6	37.80
.078 (5/64)		.0780	.234 (3x)	3	1/8	1-1/2	970578-C6	37.80
.078 (5/64)		.0780	.234 (3x)	4	1/8	1-1/2	893078-C6	40.10
.078 (5/64)		.0780	.406 (5x)	3	1/8	2-1/2	930678-C6	46.00

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00 mm - .02 mm	decimal equivalent	+ .010" - .000" + .25 mm - .00 mm					
2.0 mm	.0787		3.00 mm (1.5x)	3	4 mm	50 mm	968045-C6	39.70
2.0 mm	.0787		6.00 mm (3x)	3	4 mm	50 mm	975345-C6	39.70
2.0 mm	.0787		10.00 mm (5x)	3	4 mm	50 mm	911345-C6	48.10
.080	.0800		.120 (1.5x)	3	1/8	1-1/2	944280-C6	38.30
.080	.0800		.240 (3x)	3	1/8	1-1/2	970580-C6	38.30
.090	.0900		.135 (1.5x)	3	1/8	1-1/2	944290-C6	38.30
.090	.0900		.270 (3x)	3	1/8	1-1/2	970590-C6	38.30
.093 (3/32)	.0930		.074 (0.8x)	3	1/8	1-1/2	848193-C6	38.90
.093 (3/32)	.0930		.140 (1.5x)	3	1/8	1-1/2	944293-C6	37.80
.093 (3/32)	.0930		.140 (1.5x)	4	1/8	1-1/2	814593-C6	40.10
.093 (3/32)	.0930		.279 (3x)	3	1/8	1-1/2	970593-C6	37.80
.093 (3/32)	.0930		.279 (3x)	4	1/8	1-1/2	893093-C6	40.10
.093 (3/32)	.0930		.375 (4x)	3	1/8	2-1/2	811293-C6	46.50
.093 (3/32)	.0930		.500 (5x)	3	1/8	2-1/2	930693-C6	46.50
2.5 mm	.0984		3.70 mm (1.5x)	3	4 mm	50 mm	968051-C6	41.80
2.5 mm	.0984		7.50 mm (3x)	3	4 mm	50 mm	975351-C6	41.80
.100	.1000		.150 (1.5x)	3	1/8	1-1/2	944300-C6	38.00
.100	.1000		.300 (3x)	3	1/8	1-1/2	970600-C6	38.00
.100	.1000		.500 (5x)	3	1/8	2-1/2	930700-C6	46.60
.109 (7/64)	.1090		.327 (3x)	3	1/8	1-1/2	970602-C6	40.30
3.0 mm	.1181		4.50 mm (1.5x)	3	4 mm	50 mm	968057-C6	39.70
3.0 mm	.1181		9.00 mm (3x)	3	4 mm	50 mm	975357-C6	39.70
3.0 mm	.1181		9.00 mm (3x)	4	4 mm	50 mm	793857-C6	42.00
3.0 mm	.1181		15.00 mm (5x)	3	4 mm	50 mm	911357-C6	48.10

D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" - .002"	+ .00 mm - .04 mm	decimal equivalent	+ .030" - .000" + .75 mm - .00 mm					
.125 (1/8)	.1250		.100 (0.8x)	4	1/8	1-1/2	848208-C6	38.90
.125 (1/8)	.1250		.187 (1.5x)	4	1/8	1-1/2	944308-C6	35.70
.125 (1/8)	.1250		.375 (3x)	4	1/8	1-1/2	970608-C6	35.70
.125 (1/8)	.1250		.500 (4x)	4	1/8	2-1/2	811308-C6	46.50
.125 (1/8)	.1250		.625 (5x)	4	1/8	2-1/2	930708-C6	46.50
.140 (9/64)	.1406		.220 (1.5x)	4	3/16	2	944309-C6	48.70
.140 (9/64)	.1406		.425 (3x)	4	3/16	2	970609-C6	48.70
.140 (9/64)	.1406		.750 (5x)	4	3/16	3	930709-C6	54.50
.156 (5/32)	.1562		.235 (1.5x)	4	3/16	2	944310-C6	40.30
.156 (5/32)	.1562		.470 (3x)	4	3/16	2	970610-C6	40.30
.156 (5/32)	.1562		.750 (5x)	4	3/16	3	930710-C6	49.10
.187 (3/16)	.1875		.150 (0.8x)	4	3/16	2	848212-C6	41.40
.187 (3/16)	.1875		.285 (1.5x)	4	3/16	2	944312-C6	37.90
.187 (3/16)	.1875		.562 (3x)	4	3/16	2	970612-C6	37.90
.187 (3/16)	.1875		.750 (4x)	4	3/16	3	811312-C6	41.40
.187 (3/16)	.1875		1.000 (5x)	4	3/16	3	930712-C6	49.10
6.0 mm	.2362		18.00 mm (3x)	4	6 mm	63 mm	975372-C6	52.60

continued on next page

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" / - .002"	+ .00 mm / - .04 mm	decimal equivalent	+ .030" / - .000" / + .75 mm / - .00 mm					
.250 (1/4)	.2500	.2500	.200 (0.8x)	4	1/4	2-1/2	848216-C6	50.00
.250 (1/4)	.2500	.2500	.375 (1.5x)	4	1/4	2-1/2	944316-C6	45.90
.250 (1/4)	.2500	.2500	.750 (3x)	4	1/4	2-1/2	970616-C6	45.90
.250 (1/4)	.2500	.2500	1.000 (4x)	4	1/4	4	811316-C6	55.20
.250 (1/4)	.2500	.2500	1.250 (5x)	4	1/4	4	930716-C6	57.50
.375 (3/8)	.3750	.3750	.570 (1.5x)	4	3/8	2-1/2	944324-C6	71.60 NEW
.375 (3/8)	.3750	.3750	1.125 (3x)	4	3/8	2-1/2	970624-C6	71.60
.500 (1/2)	.5000	.5000	.750 (1.5x)	4	1/2	3	944332-C6	86.30 NEW
.500 (1/2)	.5000	.5000	1.500 (3x)	4	1/2	3	970632-C6	86.30 NEW

PLEASE SEE SPEEDS & FEEDS ON PAGE 139

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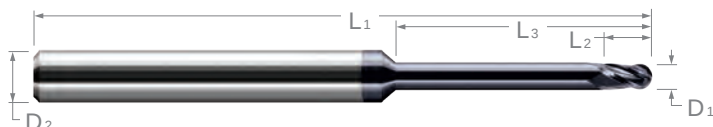


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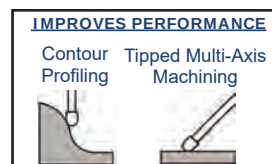


VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball – Long Reach, Stub Flute



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- h6 shank tolerance for high precision tool holders
- Center cutting Solid carbide CNC ground in the USA 



HIGH TEMP ALLOYS

mm & in

CUTTER DIAMETER			LENGTH OF CUT L ₂	OVERALL REACH L ₃	FLUTES	SHANK DIAMETER D ₂ (h6)	OVERALL LENGTH L ₁	AITIN NANO COATED	
D ₁								4 FL	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .010" / - .000" / + .25mm / - .00mm	+ .010" / - .000" / + .25mm / - .00mm					
.015 (1/64)	.0150		.022	.078 (5x)	4	1/8	2-1/2	63615-C6	65.80
.015 (1/64)	.0150		.022	.125 (8x)	4	1/8	2-1/2	56115-C6	67.00
.015 (1/64)	.0150		.022	.187 (12x)	4	1/8	2-1/2	64815-C6	71.40
.4 mm	.0157		.60 mm	2.0 mm (5x)	4	4 mm	50 mm	988709-C6	71.70
.4 mm	.0157		.60 mm	3.2 mm (8x)	4	4 mm	50 mm	974009-C6	72.80
.4 mm	.0157		.60 mm	4.8 mm (12x)	4	4 mm	50 mm	981309-C6	78.10
.5 mm	.0196		.75 mm	2.5 mm (5x)	4	4 mm	50 mm	988711-C6	69.40
.5 mm	.0196		.75 mm	4.0 mm (8x)	4	4 mm	50 mm	974011-C6	70.40
.5 mm	.0196		.75 mm	6.0 mm (12x)	4	4 mm	50 mm	981311-C6	75.40
.5 mm	.0196		.75 mm	8.0 mm (16x)	4	4 mm	50 mm	976511-C6	78.80
.020	.0200		.030	.100 (5x)	4	1/8	2-1/2	63620-C6	62.80
.020	.0200		.030	.160 (8x)	4	1/8	2-1/2	56120-C6	64.10
.020	.0200		.030	.250 (12x)	4	1/8	2-1/2	64820-C6	68.70
.6 mm	.0236		.90 mm	3.0 mm (5x)	4	4 mm	50 mm	988713-C6	67.60
.6 mm	.0236		.90 mm	4.8 mm (8x)	4	4 mm	50 mm	974013-C6	69.10
.6 mm	.0236		.90 mm	7.2 mm (12x)	4	4 mm	50 mm	981313-C6	73.70
.025	.0250		.037	.125 (5x)	4	1/8	2-1/2	63625-C6	61.20
.025	.0250		.037	.203 (8x)	4	1/8	2-1/2	56125-C6	62.50
.025	.0250		.037	.312 (12x)	4	1/8	2-1/2	64825-C6	67.30
.031 (1/32)	.0310		.047	.093 (3x)	4	1/8	1-1/2	929031-C6	56.00
.031 (1/32)	.0310		.047	.156 (5x)	4	1/8	2-1/2	63631-C6	57.50
.031 (1/32)	.0310		.047	.187 (6x)	4	1/8	2-1/2	797531-C6	57.50
.031 (1/32)	.0310		.047	.250 (8x)	4	1/8	2-1/2	56131-C6	58.90
.031 (1/32)	.0310		.047	.312 (10x)	4	1/8	2-1/2	887231-C6	60.00
.031 (1/32)	.0310		.047	.375 (12x)	4	1/8	2-1/2	64831-C6	60.70
.031 (1/32)	.0310		.047	.470 (15x)	4	1/8	2-1/2	953331-C6	63.70
.8 mm	.0314		1.20 mm	4.0 mm (5x)	4	4 mm	50 mm	988718-C6	63.10
.8 mm	.0314		1.20 mm	6.5 mm (8x)	4	4 mm	50 mm	974018-C6	64.50
.8 mm	.0314		1.20 mm	9.5 mm (12x)	4	4 mm	50 mm	981318-C6	66.10
.035	.0350		.052	.187 (5x)	4	1/8	2-1/2	63635-C6	57.50

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball – Long Reach, Stub Flute (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁		decimal equivalent	L ₂	L ₃		D ₂ (h6)	L ₁	4 FL	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm		+ .010" / - .000" / + .25 mm / - .00 mm	+ .010" / - .000" / + .25 mm / - .00 mm					
1.0 mm	.0393		1.50 mm	5.0 mm (5x)	4	4 mm	50 mm	988722-C6	63.10
1.0 mm	.0393		1.50 mm	8.0 mm (8x)	4	4 mm	50 mm	974022-C6	64.50
1.0 mm	.0393		1.50 mm	12.0 mm (12x)	4	4 mm	50 mm	981322-C6	66.10
1.0 mm	.0393		1.50 mm	16.0 mm (16x)	4	4 mm	50 mm	976522-C6	69.40
.040	.0400		.060	.203 (5x)	4	1/8	2-1/2	63640-C6	57.50
.040	.0400		.060	.325 (8x)	4	1/8	2-1/2	56140-C6	58.90
.045	.0450		.067	.225 (5x)	4	1/8	2-1/2	63645-C6	57.50
.047 (3/64)	.0470		.070	.250 (5x)	4	1/8	2-1/2	63647-C6	57.50
.047 (3/64)	.0470		.070	.375 (8x)	4	1/8	2-1/2	56147-C6	58.90
.047 (3/64)	.0470		.070	.480 (10x)	4	1/8	2-1/2	887247-C6	60.00
.047 (3/64)	.0470		.070	.570 (12x)	4	1/8	2-1/2	64847-C6	60.70
.050	.0500		.075	.250 (5x)	4	1/8	2-1/2	63650-C6	57.50
.050	.0500		.075	.400 (8x)	4	1/8	2-1/2	56150-C6	58.90
.055	.0550		.082	.275 (5x)	4	1/8	2-1/2	63655-C6	57.50
1.5 mm	.0590		2.20 mm	7.5 mm (5x)	4	4 mm	50 mm	988733-C6	63.10
1.5 mm	.0590		2.20 mm	12.0 mm (8x)	4	4 mm	50 mm	974033-C6	64.50
1.5 mm	.0590		2.20 mm	18.0 mm (12x)	4	4 mm	50 mm	981333-C6	66.10
1.5 mm	.0590		2.20 mm	24.0 mm (16x)	4	4 mm	63 mm	976533-C6	69.40
.060	.0600		.090	.312 (5x)	4	1/8	2-1/2	63660-C6	57.50
.060	.0600		.090	.500 (8x)	4	1/8	2-1/2	56160-C6	58.90
.062 (1/16)	.0620		.093	.186 (3x)	4	1/8	1-1/2	929062-C6	56.00
.062 (1/16)	.0620		.093	.312 (5x)	4	1/8	2-1/2	63662-C6	57.50
.062 (1/16)	.0620		.093	.375 (6x)	4	1/8	2-1/2	797562-C6	57.50
.062 (1/16)	.0620		.093	.500 (8x)	4	1/8	2-1/2	56162-C6	58.90
.062 (1/16)	.0620		.093	.625 (10x)	4	1/8	2-1/2	887262-C6	60.00
.062 (1/16)	.0620		.093	.750 (12x)	4	1/8	2-1/2	64862-C6	60.70
.062 (1/16)	.0620		.093	.950 (15x)	4	1/8	2-1/2	953362-C6	63.70
.070	.0700		.105	.375 (5x)	4	1/8	2-1/2	63670-C6	57.50
.070	.0700		.105	.570 (8x)	4	1/8	2-1/2	56170-C6	58.90
.078 (5/64)	.0780		.117	.406 (5x)	4	1/8	2-1/2	63678-C6	57.50
.078 (5/64)	.0780		.117	.625 (8x)	4	1/8	2-1/2	56178-C6	58.90
.078 (5/64)	.0780		.117	.940 (12x)	4	1/8	2-1/2	64878-C6	60.70
2.0 mm	.0787		3.00 mm	10.0 mm (5x)	4	4 mm	50 mm	988745-C6	62.90
2.0 mm	.0787		3.00 mm	12.0 mm (6x)	4	4 mm	50 mm	749245-C6	63.60
2.0 mm	.0787		3.00 mm	16.0 mm (8x)	4	4 mm	50 mm	974045-C6	64.30
2.0 mm	.0787		3.00 mm	24.0 mm (12x)	4	4 mm	63 mm	981345-C6	66.10
2.0 mm	.0787		3.00 mm	32.0 mm (16x)	4	4 mm	63 mm	976545-C6	69.40
.093 (3/32)	.0930		.139	.279 (3x)	4	1/8	1-1/2	929093-C6	56.00
.093 (3/32)	.0930		.139	.500 (5x)	4	1/8	2-1/2	63693-C6	57.50
.093 (3/32)	.0930		.139	.585 (6x)	4	1/8	2-1/2	797593-C6	57.50
.093 (3/32)	.0930		.139	.750 (8x)	4	1/8	2-1/2	56193-C6	58.90
.093 (3/32)	.0930		.139	.950 (10x)	4	1/8	2-1/2	887293-C6	60.00
.093 (3/32)	.0930		.139	1.125 (12x)	4	1/8	2-1/2	64893-C6	60.70
.093 (3/32)	.0930		.139	1.400 (15x)	4	1/8	3	953393-C6	63.70

NEW

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Ball – Long Reach, Stub Flute (cont.)



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CUTTER DIAMETER	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" - .0005" +.00mm - .02mm decimal equivalent	L ₂ +.010" - .000" +.25mm - .00mm	L ₃ +.010" - .000" +.25mm - .00mm		D ₂ (h6)	L ₁	4 FL	PRICE
.100	.150	.500 (5x)	4	1/8	2-1/2	63700-C6	56.90
.100	.150	.800 (8x)	4	1/8	2-1/2	56200-C6	58.10
3.0 mm	4.50 mm	15.0 mm (5x)	4	4 mm	50 mm	988757-C6	59.70
3.0 mm	4.50 mm	24.0 mm (8x)	4	4 mm	50 mm	974057-C6	61.10

D ₁ +.000" - .002" decimal equivalent	L ₂ +.030" - .000" L ₃ +.030" - .000"		D ₂ (h6)	L ₁	4 FL	PRICE
.125 (1/8)	.187	.375 (3x)	4	1/8	1-1/2	929108-C6 56.00
.125 (1/8)	.187	.625 (5x)	4	1/8	2-1/2	63708-C6 57.10
.125 (1/8)	.187	.750 (6x)	4	1/8	2-1/2	797608-C6 57.10
.125 (1/8)	.187	1.000 (8x)	4	1/8	2-1/2	56208-C6 58.30
.125 (1/8)	.187	1.250 (10x)	4	1/8	3	887308-C6 60.00
.125 (1/8)	.187	1.500 (12x)	4	1/8	3	64908-C6 60.70
.140 (9/64)	.220	.750 (5x)	4	3/16	3	63709-C6 61.90
.156 (5/32)	.234	.750 (5x)	4	3/16	3	63710-C6 61.90
.156 (5/32)	.234	1.250 (8x)	4	3/16	3	56210-C6 63.10
.156 (5/32)	.234	1.570 (10x)	4	3/16	4	887310-C6 66.00
.187 (3/16)	.281	1.000 (5x)	4	3/16	3	63712-C6 62.80
.187 (3/16)	.281	1.500 (8x)	4	3/16	3	56212-C6 64.20
.187 (3/16)	.281	1.875 (10x)	4	3/16	4	887312-C6 67.20
.250 (1/4)	.375	1.250 (5x)	4	1/4	4	63716-C6 69.60
.250 (1/4)	.375	2.000 (8x)	4	1/4	4	56216-C6 70.90
.250 (1/4)	.375	2.500 (10x)	4	1/4	6	887316-C6 82.50
.375 (3/8)	.570	2.000 (5x)	4	3/8	4	63724-C6 86.70

NEW

HIGH TEMP ALLOYS

SPEEDS & FEEDS (Variable Helix – Long Reach, Stub Flute for High Temp Alloys)

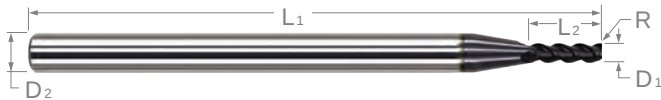
Important Note: Values in table are in inches and are based on 4 flute, reached (8x Dia) end mills. For 3 flutes, table values of IPT must be increased to 105% before adjustments for different reaches. For shorter reaches, table values of IPT must be increased (for 3x, increase to 135%; for 5x, increase to 125%; for 6x, increase to 120%; for 7x, increase to 110%). For longer reaches, table values of IPT and DOC must be reduced (for 10x, reduce to 90%; for 12x, reduce to 80%; for 15x, reduce to 75%). For complete speeds and feeds charts, please see www.harveytool.com

Material	Hardness (HBN)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter											
			.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500
Stainless Steels: 40x, 41x, 42x, 43x, 44x, 13-8, 15-5, 15-7, 17-4, 17-7 Tool Steels: D, H, M, T, S series	275 - 300	160	Slotting	.00004	.00008	.00012	.00016	.00021	.00025	.00033	.00049	.00066	.00086	.00104
	300 - 350	140	Roughing	.00005	.00010	.00016	.00021	.00026	.00031	.00042	.00063	.00084	.00110	.00132
	350 - 400	100	Finishing	.00007	.00014	.00021	.00027	.00034	.00041	.00055	.00082	.00110	.00144	.00173
	400 - 425	80	Max	.00008	.00016	.00025	.00033	.00041	.00049	.00066	.00099	.00132	.00173	.00208
Titanium: All alloys	275 - 300	200	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .28x Dia Finishing: .1x Dia Axial Depth of Cut*: Slotting: .28x Dia Roughing: .5x - .7x Dia Finishing: .5x - 1x Dia											
	300 - 350	125												
	350 - 400	75												
	400 - 425	75												
Nickel Alloys: Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	275 - 300	80												
	300 - 350	60												
	350 - 400	50												
	400 - 425	40												

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius



- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design (approx. 34°) reduces chatter and harmonics and increases material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- Suitable for steels up to 45Rc
- Center cutting Solid carbide CNC ground in the USA 


mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁			R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm	decimal equivalent	+ .001" / - .001" / + .025 mm / - .025 mm	+ .010" / - .000" / + .25 mm / - .00 mm					
.2 mm	.0078		.05 mm	.30 mm (1.5x)	3	4 mm	50 mm	984104-C6	58.60
.2 mm	.0078		.05 mm	.60 mm (3x)	3	4 mm	50 mm	979304-C6	58.60
.010	.0100		.003	.015 (1.5x)	3	1/8	1-1/2	52210-C6	55.20
.010	.0100		.003	.030 (3x)	3	1/8	1-1/2	46810-C6	55.60
.3 mm	.0118		.08 mm	.45 mm (1.5x)	3	4 mm	50 mm	984106-C6	57.10
.3 mm	.0118		.08 mm	.90 mm (3x)	3	4 mm	50 mm	979306-C6	57.10
.015 (1/64)	.0150		.003	.012 (0.8x)	3	1/8	1-1/2	954215-C6	48.50
.015 (1/64)	.0150		.003	.022 (1.5x)	3	1/8	1-1/2	52215-C6	45.80
.015 (1/64)	.0150		.003	.045 (3x)	3	1/8	1-1/2	46815-C6	45.80
.015 (1/64)	.0150		.003	.078 (5x)	3	1/8	2-1/2	53615-C6	55.50
.015 (1/64)	.0150		.005	.045 (3x)	3	1/8	1-1/2	936415-C6	52.10
.4 mm	.0157		.08 mm	.60 mm (1.5x)	3	4 mm	50 mm	984109-C6	49.10
.4 mm	.0157		.08 mm	1.20 mm (3x)	3	4 mm	50 mm	979309-C6	49.10
.5 mm	.0196		.10 mm	.75 mm (1.5x)	3	4 mm	50 mm	984111-C6	43.90
.5 mm	.0196		.10 mm	1.50 mm (3x)	3	4 mm	50 mm	979311-C6	43.90
.5 mm	.0196		.10 mm	2.50 mm (5x)	3	4 mm	50 mm	965811-C6	55.70
.020	.0200		.004	.016 (0.8x)	3	1/8	1-1/2	954220-C6	42.80
.020	.0200		.004	.030 (1.5x)	3	1/8	1-1/2	52220-C6	40.30
.020	.0200		.004	.060 (3x)	3	1/8	1-1/2	46820-C6	40.30
.020	.0200		.004	.060 (3x)	4	1/8	1-1/2	786620-C6	42.60
.020	.0200		.004	.100 (5x)	3	1/8	2-1/2	53620-C6	49.30
.6 mm	.0236		.10 mm	.90 mm (1.5x)	3	4 mm	50 mm	984113-C6	42.50
.6 mm	.0236		.10 mm	1.80 mm (3x)	3	4 mm	50 mm	979313-C6	42.50
.025	.0250		.004	.020 (0.8x)	3	1/8	1-1/2	954225-C6	41.70
.025	.0250		.004	.038 (1.5x)	3	1/8	1-1/2	52225-C6	39.10
.025	.0250		.004	.075 (3x)	3	1/8	1-1/2	46825-C6	39.10
.025	.0250		.004	.075 (3x)	4	1/8	1-1/2	786625-C6	41.40
.025	.0250		.004	.125 (5x)	3	1/8	2-1/2	53625-C6	47.70
.7 mm	.0275		.10 mm	2.10 mm (3x)	3	4 mm	50 mm	979315-C6	42.50
.030	.0300		.004	.045 (1.5x)	3	1/8	1-1/2	52230-C6	39.10
.030	.0300		.004	.090 (3x)	3	1/8	1-1/2	46830-C6	39.10
.030	.0300		.004	.156 (5x)	3	1/8	2-1/2	53630-C6	47.70

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
D ₁		decimal equivalent	R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm		+ .001" / - .001" / + .025 mm / - .025 mm	+ .010" / - .000" / + .25 mm / - .00 mm					
.031 (1/32)		.0310	.003	.047 (1.5x)	3	1/8	1-1/2	853631-C6	35.90
.031 (1/32)		.0310	.003	.093 (3x)	3	1/8	1-1/2	923631-C6	33.00
.031 (1/32)		.0310	.005	.025 (0.8x)	3	1/8	1-1/2	954231-C6	34.30
.031 (1/32)		.0310	.005	.047 (1.5x)	3	1/8	1-1/2	52231-C6	33.30
.031 (1/32)		.0310	.005	.047 (1.5x)	4	1/8	1-1/2	795531-C6	35.20
.031 (1/32)		.0310	.005	.093 (3x)	3	1/8	1-1/2	46831-C6	33.30
.031 (1/32)		.0310	.005	.093 (3x)	4	1/8	1-1/2	850731-C6	35.20
.031 (1/32)		.0310	.005	.125 (4x)	3	1/8	2-1/2	796731-C6	37.10
.031 (1/32)		.0310	.005	.156 (5x)	3	1/8	2-1/2	53631-C6	41.40
.031 (1/32)		.0310	.005	.156 (5x)	4	1/8	2-1/2	796931-C6	44.30
.031 (1/32)		.0310	.008	.047 (1.5x)	3	1/8	1-1/2	847831-C6	36.10
.031 (1/32)		.0310	.008	.093 (3x)	3	1/8	1-1/2	848431-C6	36.10
.031 (1/32)		.0310	.010	.047 (1.5x)	3	1/8	1-1/2	912931-C6	35.90
.031 (1/32)		.0310	.010	.093 (3x)	3	1/8	1-1/2	950731-C6	36.10
.031 (1/32)		.0310	.010	.093 (3x)	4	1/8	1-1/2	856431-C6	35.20
.031 (1/32)		.0310	.010	.156 (5x)	3	1/8	2-1/2	869831-C6	44.30
.8 mm		.0314	.10 mm	1.20 mm (1.5x)	3	4 mm	50 mm	984118-C6	36.90
.8 mm		.0314	.10 mm	2.40 mm (3x)	3	4 mm	50 mm	979318-C6	36.90
.035		.0350	.005	.053 (1.5x)	3	1/8	1-1/2	52235-C6	33.30
.035		.0350	.005	.105 (3x)	3	1/8	1-1/2	46835-C6	33.30
.035		.0350	.005	.187 (5x)	3	1/8	2-1/2	53635-C6	41.40
.035		.0350	.010	.105 (3x)	3	1/8	1-1/2	950735-C6	36.10
.9 mm		.0354	.10 mm	2.70 mm (3x)	3	4 mm	50 mm	979320-C6	36.90
1.0 mm		.0393	.10 mm	1.50 mm (1.5x)	3	4 mm	50 mm	984122-C6	36.90
1.0 mm		.0393	.10 mm	3.00 mm (3x)	3	4 mm	50 mm	979322-C6	36.90
1.0 mm		.0393	.10 mm	5.00 mm (5x)	3	4 mm	50 mm	965822-C6	45.60
1.0 mm		.0393	.30 mm	3.00 mm (3x)	3	4 mm	50 mm	843322-C6	36.90
.040		.0400	.003	.120 (3x)	3	1/8	1-1/2	923640-C6	33.30
.040		.0400	.005	.032 (0.8x)	3	1/8	1-1/2	954240-C6	35.90
.040		.0400	.005	.060 (1.5x)	3	1/8	1-1/2	52240-C6	33.30
.040		.0400	.005	.120 (3x)	3	1/8	1-1/2	46840-C6	33.30
.040		.0400	.005	.203 (5x)	3	1/8	2-1/2	53640-C6	41.40
.040		.0400	.010	.120 (3x)	3	1/8	1-1/2	950740-C6	36.10
1.1 mm		.0433	.10 mm	3.00 mm (3x)	3	4 mm	50 mm	979324-C6	36.90
.045		.0450	.005	.068 (1.5x)	3	1/8	1-1/2	52245-C6	33.30
.045		.0450	.005	.135 (3x)	3	1/8	1-1/2	46845-C6	33.30
.045		.0450	.005	.225 (5x)	3	1/8	2-1/2	53645-C6	41.40
.047 (3/64)		.0470	.003	.141 (3x)	3	1/8	1-1/2	923647-C6	33.00
.047 (3/64)		.0470	.005	.038 (0.8x)	3	1/8	1-1/2	954247-C6	34.30
.047 (3/64)		.0470	.005	.071 (1.5x)	3	1/8	1-1/2	52247-C6	33.30
.047 (3/64)		.0470	.005	.071 (1.5x)	4	1/8	1-1/2	795547-C6	35.20
.047 (3/64)		.0470	.005	.141 (3x)	3	1/8	1-1/2	46847-C6	33.30
.047 (3/64)		.0470	.005	.141 (3x)	4	1/8	1-1/2	850747-C6	35.20
.047 (3/64)		.0470	.005	.187 (4x)	3	1/8	2-1/2	796747-C6	37.10
.047 (3/64)		.0470	.005	.250 (5x)	3	1/8	2-1/2	53647-C6	41.40
.047 (3/64)		.0470	.005	.250 (5x)	4	1/8	2-1/2	796947-C6	44.30
.047 (3/64)		.0470	.010	.071 (1.5x)	3	1/8	1-1/2	912947-C6	35.90
.047 (3/64)		.0470	.010	.141 (3x)	3	1/8	1-1/2	950747-C6	36.10
.047 (3/64)		.0470	.015	.071 (1.5x)	3	1/8	1-1/2	975647-C6	33.30
.047 (3/64)		.0470	.015	.141 (3x)	3	1/8	1-1/2	964147-C6	36.10

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER		CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" -.0005"	+.00mm -.02mm decimal equivalent	R +.001" -.001" +.025mm -.025mm	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
1.2 mm	.0472	.10 mm	1.80 mm (1.5x)	3	4 mm	50 mm	984127-C6	36.90
1.2 mm	.0472	.10 mm	3.50 mm (3x)	3	4 mm	50 mm	979327-C6	36.90
.050	.0500	.005	.040 (0.8x)	3	1/8	1-1/2	954250-C6	35.90
.050	.0500	.005	.075 (1.5x)	3	1/8	1-1/2	52250-C6	33.00
.050	.0500	.005	.150 (3x)	3	1/8	1-1/2	46850-C6	33.00
.050	.0500	.005	.250 (5x)	3	1/8	2-1/2	53650-C6	41.40
.050	.0500	.010	.075 (1.5x)	3	1/8	1-1/2	912950-C6	35.90
.050	.0500	.010	.150 (3x)	3	1/8	1-1/2	950750-C6	36.10
.050	.0500	.015	.075 (1.5x)	3	1/8	1-1/2	975650-C6	36.10
.050	.0500	.015	.150 (3x)	3	1/8	1-1/2	964150-C6	34.30
1.3 mm	.0511	.10 mm	4.00 mm (3x)	3	4 mm	50 mm	979329-C6	36.90
.055	.0550	.005	.083 (1.5x)	3	1/8	1-1/2	52255-C6	33.00
.055	.0550	.005	.165 (3x)	3	1/8	1-1/2	46855-C6	33.00
.055	.0550	.005	.275 (5x)	3	1/8	2-1/2	53655-C6	41.40
.055	.0550	.010	.083 (1.5x)	3	1/8	1-1/2	912955-C6	35.90
.055	.0550	.010	.165 (3x)	3	1/8	1-1/2	950755-C6	36.10
.055	.0550	.015	.083 (1.5x)	3	1/8	1-1/2	975655-C6	36.10
.055	.0550	.015	.165 (3x)	3	1/8	1-1/2	964155-C6	36.10
1.4 mm	.0551	.10 mm	2.10 mm (1.5x)	3	4 mm	50 mm	984131-C6	36.90
1.4 mm	.0551	.10 mm	4.00 mm (3x)	3	4 mm	50 mm	979331-C6	36.90
1.5 mm	.0590	.20 mm	2.20 mm (1.5x)	3	4 mm	50 mm	984133-C6	34.60
1.5 mm	.0590	.20 mm	4.50 mm (3x)	3	4 mm	50 mm	979333-C6	34.60
1.5 mm	.0590	.20 mm	7.50 mm (5x)	3	4 mm	50 mm	965833-C6	42.30
.060	.0600	.005	.090 (1.5x)	3	1/8	1-1/2	908860-C6	33.00
.060	.0600	.005	.180 (3x)	3	1/8	1-1/2	936460-C6	33.00
.060	.0600	.005	.312 (5x)	3	1/8	2-1/2	869060-C6	41.40
.060	.0600	.010	.048 (0.8x)	3	1/8	1-1/2	954260-C6	35.90
.060	.0600	.010	.090 (1.5x)	3	1/8	1-1/2	52260-C6	33.00
.060	.0600	.010	.180 (3x)	3	1/8	1-1/2	46860-C6	33.00
.060	.0600	.010	.312 (5x)	3	1/8	2-1/2	53660-C6	41.40
.060	.0600	.015	.090 (1.5x)	3	1/8	1-1/2	975660-C6	33.30
.060	.0600	.015	.180 (3x)	3	1/8	1-1/2	964160-C6	33.30
.060	.0600	.020	.090 (1.5x)	3	1/8	1-1/2	931760-C6	33.70
.060	.0600	.020	.180 (3x)	3	1/8	1-1/2	959260-C6	34.00
.062 (1/16)	.0620	.003	.093 (1.5x)	3	1/8	1-1/2	853662-C6	31.00
.062 (1/16)	.0620	.003	.186 (3x)	3	1/8	1-1/2	923662-C6	31.00
.062 (1/16)	.0620	.005	.093 (1.5x)	3	1/8	1-1/2	908862-C6	31.00
.062 (1/16)	.0620	.005	.093 (1.5x)	4	1/8	1-1/2	795562-C6	33.30
.062 (1/16)	.0620	.005	.186 (3x)	3	1/8	1-1/2	936462-C6	31.00
.062 (1/16)	.0620	.005	.186 (3x)	4	1/8	1-1/2	850762-C6	33.30
.062 (1/16)	.0620	.005	.312 (5x)	3	1/8	2-1/2	869062-C6	39.50
.062 (1/16)	.0620	.008	.093 (1.5x)	3	1/8	1-1/2	847862-C6	31.00
.062 (1/16)	.0620	.008	.186 (3x)	3	1/8	1-1/2	848462-C6	31.00
.062 (1/16)	.0620	.010	.050 (0.8x)	3	1/8	1-1/2	954262-C6	31.00
.062 (1/16)	.0620	.010	.093 (1.5x)	3	1/8	1-1/2	52262-C6	31.00
.062 (1/16)	.0620	.010	.093 (1.5x)	4	1/8	1-1/2	797162-C6	35.20
.062 (1/16)	.0620	.010	.186 (3x)	3	1/8	1-1/2	46862-C6	31.00
.062 (1/16)	.0620	.010	.186 (3x)	4	1/8	1-1/2	856462-C6	35.20
.062 (1/16)	.0620	.010	.250 (4x)	3	1/8	2-1/2	796562-C6	36.50

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00mm - .02mm	decimal equivalent	+ .001" - .001" + .025mm - .025mm	+ .010" - .000" + .25mm - .00mm					
.062 (1/16)		.0620	.010	.312 (5x)	3	1/8	2-1/2	53662-C6	39.70
.062 (1/16)		.0620	.010	.312 (5x)	4	1/8	2-1/2	797362-C6	43.60
.062 (1/16)		.0620	.015	.093 (1.5x)	3	1/8	1-1/2	975662-C6	31.00
.062 (1/16)		.0620	.015	.186 (3x)	3	1/8	1-1/2	964162-C6	31.00
.062 (1/16)		.0620	.015	.312 (5x)	3	1/8	2-1/2	860262-C6	39.70
.062 (1/16)		.0620	.020	.093 (1.5x)	3	1/8	1-1/2	931762-C6	34.10
.062 (1/16)		.0620	.020	.186 (3x)	3	1/8	1-1/2	959262-C6	37.40
.062 (1/16)		.0620	.020	.186 (3x)	4	1/8	1-1/2	786462-C6	38.90
.062 (1/16)		.0620	.020	.312 (5x)	3	1/8	2-1/2	870662-C6	39.70
1.6 mm		.0629	.20 mm	2.40 mm (1.5x)	3	4 mm	50 mm	984136-C6	34.60
1.6 mm		.0629	.20 mm	5.00 mm (3x)	3	4 mm	50 mm	979336-C6	34.60
1.7 mm		.0669	.20 mm	5.00 mm (3x)	3	4 mm	50 mm	979338-C6	34.60
.070		.0700	.005	.210 (3x)	3	1/8	1-1/2	936470-C6	31.00
.070		.0700	.010	.105 (1.5x)	3	1/8	1-1/2	52270-C6	31.00
.070		.0700	.010	.210 (3x)	3	1/8	1-1/2	46870-C6	31.00
.070		.0700	.010	.375 (5x)	3	1/8	2-1/2	53670-C6	39.70
1.8 mm		.0708	.20 mm	2.70 mm (1.5x)	3	4 mm	50 mm	984140-C6	34.60
1.8 mm		.0708	.20 mm	5.50 mm (3x)	3	4 mm	50 mm	979340-C6	34.60
1.9 mm		.0748	.20 mm	5.50 mm (3x)	3	4 mm	50 mm	979342-C6	34.60
.078 (5/64)		.0780	.003	.234 (3x)	3	1/8	1-1/2	923678-C6	31.60
.078 (5/64)		.0780	.005	.117 (1.5x)	3	1/8	1-1/2	908878-C6	31.00
.078 (5/64)		.0780	.005	.117 (1.5x)	4	1/8	1-1/2	795578-C6	33.30
.078 (5/64)		.0780	.005	.234 (3x)	3	1/8	1-1/2	936478-C6	31.00
.078 (5/64)		.0780	.005	.406 (5x)	3	1/8	2-1/2	869078-C6	39.50
.078 (5/64)		.0780	.010	.062 (0.8x)	3	1/8	1-1/2	954278-C6	31.00
.078 (5/64)		.0780	.010	.117 (1.5x)	3	1/8	1-1/2	52278-C6	31.00
.078 (5/64)		.0780	.010	.117 (1.5x)	4	1/8	1-1/2	797178-C6	35.20
.078 (5/64)		.0780	.010	.234 (3x)	3	1/8	1-1/2	46878-C6	31.00
.078 (5/64)		.0780	.010	.234 (3x)	4	1/8	1-1/2	856478-C6	35.20
.078 (5/64)		.0780	.010	.312 (4x)	3	1/8	2-1/2	796578-C6	37.10
.078 (5/64)		.0780	.010	.406 (5x)	3	1/8	2-1/2	53678-C6	39.50
.078 (5/64)		.0780	.010	.406 (5x)	4	1/8	2-1/2	797378-C6	44.20
.078 (5/64)		.0780	.015	.117 (1.5x)	3	1/8	1-1/2	975678-C6	34.40
.078 (5/64)		.0780	.015	.234 (3x)	3	1/8	1-1/2	964178-C6	34.40
.078 (5/64)		.0780	.020	.117 (1.5x)	3	1/8	1-1/2	931778-C6	37.40
.078 (5/64)		.0780	.020	.234 (3x)	3	1/8	1-1/2	959278-C6	37.40
.078 (5/64)		.0780	.020	.406 (5x)	3	1/8	2-1/2	870678-C6	46.40
.078 (5/64)		.0780	.025	.234 (3x)	3	1/8	1-1/2	848878-C6	37.40
2.0 mm		.0787	.20 mm	3.00 mm (1.5x)	3	4 mm	50 mm	984145-C6	34.60
2.0 mm		.0787	.20 mm	6.00 mm (3x)	3	4 mm	50 mm	979345-C6	34.60
2.0 mm		.0787	.20 mm	10.00 mm (5x)	3	4 mm	50 mm	965845-C6	42.30
2.0 mm		.0787	.50 mm	6.00 mm (3x)	3	4 mm	50 mm	842545-C6	34.60
.080		.0800	.010	.120 (1.5x)	3	1/8	1-1/2	52280-C6	31.00
.080		.0800	.010	.240 (3x)	3	1/8	1-1/2	46880-C6	31.00
.090		.0900	.010	.135 (1.5x)	3	1/8	1-1/2	52290-C6	31.00
.090		.0900	.010	.270 (3x)	3	1/8	1-1/2	46890-C6	31.00

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00 mm - .02 mm	decimal equivalent	+ .001" - .001" + .025 mm - .025 mm	+ .010" - .000" + .25 mm - .00 mm					
.093 (3/32)		.0930	.003	.279 (3x)	3	1/8	1-1/2	923693-C6	30.50
.093 (3/32)		.0930	.005	.074 (0.8x)	3	1/8	1-1/2	840593-C6	31.00
.093 (3/32)		.0930	.005	.140 (1.5x)	3	1/8	1-1/2	908893-C6	31.00
.093 (3/32)		.0930	.005	.140 (1.5x)	4	1/8	1-1/2	795593-C6	35.20
.093 (3/32)		.0930	.005	.279 (3x)	3	1/8	1-1/2	936493-C6	31.00
.093 (3/32)		.0930	.005	.279 (3x)	4	1/8	1-1/2	850793-C6	35.20
.093 (3/32)		.0930	.005	.500 (5x)	3	1/8	2-1/2	869093-C6	39.40
.093 (3/32)		.0930	.008	.140 (1.5x)	3	1/8	1-1/2	847893-C6	31.00
.093 (3/32)		.0930	.008	.279 (3x)	3	1/8	1-1/2	848493-C6	31.00
.093 (3/32)		.0930	.010	.074 (0.8x)	3	1/8	1-1/2	954293-C6	31.00
.093 (3/32)		.0930	.010	.140 (1.5x)	3	1/8	1-1/2	52293-C6	31.00
.093 (3/32)		.0930	.010	.140 (1.5x)	4	1/8	1-1/2	797193-C6	35.20
.093 (3/32)		.0930	.010	.279 (3x)	3	1/8	1-1/2	46893-C6	31.00
.093 (3/32)		.0930	.010	.279 (3x)	4	1/8	1-1/2	856493-C6	35.20
.093 (3/32)		.0930	.010	.375 (4x)	3	1/8	2-1/2	796593-C6	37.10
.093 (3/32)		.0930	.010	.500 (5x)	3	1/8	2-1/2	53693-C6	39.50
.093 (3/32)		.0930	.010	.500 (5x)	4	1/8	2-1/2	797393-C6	44.20
.093 (3/32)		.0930	.015	.140 (1.5x)	3	1/8	1-1/2	975693-C6	31.00
.093 (3/32)		.0930	.015	.279 (3x)	3	1/8	1-1/2	964193-C6	31.00
.093 (3/32)		.0930	.020	.140 (1.5x)	3	1/8	1-1/2	931793-C6	31.00
.093 (3/32)		.0930	.020	.279 (3x)	3	1/8	1-1/2	959293-C6	31.00
.093 (3/32)		.0930	.020	.500 (5x)	3	1/8	2-1/2	870693-C6	39.50
.093 (3/32)		.0930	.025	.279 (3x)	3	1/8	1-1/2	848893-C6	37.50
.093 (3/32)		.0930	.030	.140 (1.5x)	3	1/8	1-1/2	929393-C6	37.50
.093 (3/32)		.0930	.030	.279 (3x)	3	1/8	1-1/2	943893-C6	37.50
.093 (3/32)		.0930	.030	.500 (5x)	3	1/8	2-1/2	871493-C6	45.80
2.5 mm		.0984	.20 mm	3.70 mm (1.5x)	3	4 mm	50 mm	984151-C6	32.00
2.5 mm		.0984	.20 mm	7.50 mm (3x)	3	4 mm	50 mm	979351-C6	34.60
2.5 mm		.0984	.20 mm	12.00 mm (5x)	3	4 mm	50 mm	965851-C6	42.30
.100		.1000	.005	.150 (1.5x)	3	1/8	1-1/2	908800-C6	31.00
.100		.1000	.005	.300 (3x)	3	1/8	1-1/2	936500-C6	31.00
.100		.1000	.010	.150 (1.5x)	3	1/8	1-1/2	52300-C6	31.00
.100		.1000	.010	.300 (3x)	3	1/8	1-1/2	46900-C6	31.00
.100		.1000	.010	.500 (5x)	3	1/8	2-1/2	53700-C6	39.70
.100		.1000	.015	.150 (1.5x)	3	1/8	1-1/2	907700-C6	34.40
.100		.1000	.015	.300 (3x)	3	1/8	1-1/2	964200-C6	34.40
.100		.1000	.020	.150 (1.5x)	3	1/8	1-1/2	931800-C6	37.40
.100		.1000	.020	.300 (3x)	3	1/8	1-1/2	959300-C6	37.40
.100		.1000	.030	.150 (1.5x)	3	1/8	1-1/2	929400-C6	37.50
.100		.1000	.030	.300 (3x)	3	1/8	1-1/2	943900-C6	37.50
.109 (7/64)		.1090	.005	.327 (3x)	3	1/8	1-1/2	936502-C6	31.00
.109 (7/64)		.1090	.010	.327 (3x)	3	1/8	1-1/2	46902-C6	31.00
.109 (7/64)		.1090	.015	.327 (3x)	3	1/8	1-1/2	964202-C6	34.40
.118		.1180	.010	.177 (1.5x)	3	1/8	1-1/2	52305-C6	31.00
.118		.1180	.010	.354 (3x)	3	1/8	1-1/2	46905-C6	31.00
3.0 mm		.1181	.20 mm	4.50 mm (1.5x)	3	4 mm	50 mm	984157-C6	34.60
3.0 mm		.1181	.20 mm	9.00 mm (3x)	3	4 mm	50 mm	979357-C6	34.60
3.0 mm		.1181	.20 mm	15.00 mm (5x)	3	4 mm	50 mm	965857-C6	42.30

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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	CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
	D ₁ +.000" -.002"	+.00mm -.04mm	decimal equivalent	R +.001" -.001" +.025mm -.025mm	L ₂ +.030" -.000" +.75mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
NEW	3.0 mm		.1181	.50 mm	9.00 mm (3x)	3	4 mm	50 mm	842557-C6	34.60
	3.0 mm		.1181	.50 mm	15.00 mm (5x)	3	4 mm	50 mm	760957-C6	42.30
	3.0 mm		.1181	1.00 mm	9.00 mm (3x)	3	4 mm	50 mm	842157-C6	40.60
	.125 (1/8)		.1250	.003	.375 (3x)	4	1/8	1-1/2	923708-C6	30.80
	.125 (1/8)		.1250	.005	.100 (0.8x)	4	1/8	1-1/2	840608-C6	30.80
	.125 (1/8)		.1250	.005	.187 (1.5x)	4	1/8	1-1/2	908908-C6	30.80
	.125 (1/8)		.1250	.005	.375 (3x)	4	1/8	1-1/2	936508-C6	30.80
	.125 (1/8)		.1250	.005	.625 (5x)	4	1/8	2-1/2	869108-C6	39.70
	.125 (1/8)		.1250	.008	.187 (1.5x)	4	1/8	1-1/2	847908-C6	30.80
	.125 (1/8)		.1250	.008	.375 (3x)	4	1/8	1-1/2	848508-C6	30.80
	.125 (1/8)		.1250	.010	.187 (1.5x)	4	1/8	1-1/2	913008-C6	29.20
	.125 (1/8)		.1250	.010	.375 (3x)	4	1/8	1-1/2	950808-C6	29.20
	.125 (1/8)		.1250	.010	.625 (5x)	4	1/8	2-1/2	869908-C6	39.70
	.125 (1/8)		.1250	.015	.100 (0.8x)	4	1/8	1-1/2	954308-C6	31.00
	.125 (1/8)		.1250	.015	.187 (1.5x)	4	1/8	1-1/2	52308-C6	29.20
	.125 (1/8)		.1250	.015	.375 (3x)	4	1/8	1-1/2	46908-C6	29.20
	.125 (1/8)		.1250	.015	.500 (4x)	4	1/8	2-1/2	796408-C6	34.80
	.125 (1/8)		.1250	.015	.625 (5x)	4	1/8	2-1/2	53708-C6	39.70
	.125 (1/8)		.1250	.020	.100 (0.8x)	4	1/8	1-1/2	816408-C6	31.00
	.125 (1/8)		.1250	.020	.187 (1.5x)	4	1/8	1-1/2	931808-C6	35.30
	.125 (1/8)		.1250	.020	.375 (3x)	4	1/8	1-1/2	959308-C6	35.30
	.125 (1/8)		.1250	.020	.625 (5x)	4	1/8	2-1/2	870708-C6	45.10
	.125 (1/8)		.1250	.025	.375 (3x)	4	1/8	1-1/2	848908-C6	35.50
	.125 (1/8)		.1250	.030	.187 (1.5x)	4	1/8	1-1/2	929408-C6	35.50
	.125 (1/8)		.1250	.030	.375 (3x)	4	1/8	1-1/2	943908-C6	35.50
	.125 (1/8)		.1250	.030	.625 (5x)	4	1/8	2-1/2	871508-C6	46.20
	.125 (1/8)		.1250	.040	.375 (3x)	4	1/8	1-1/2	844008-C6	37.40
NEW	.140 (9/64)		.1406	.010	.425 (3x)	4	3/16	2	950809-C6	36.70
	.140 (9/64)		.1406	.015	.112 (0.8x)	4	3/16	2	954309-C6	36.90
	.140 (9/64)		.1406	.015	.220 (1.5x)	4	3/16	2	52309-C6	36.70
	.140 (9/64)		.1406	.015	.425 (3x)	4	3/16	2	46909-C6	36.90
	.140 (9/64)		.1406	.015	.750 (5x)	4	3/16	3	53709-C6	46.00
NEW	.140 (9/64)		.1406	.020	.425 (3x)	4	3/16	2	959309-C6	36.90
	.140 (9/64)		.1406	.030	.425 (3x)	4	3/16	2	943909-C6	36.90
	.156 (5/32)		.1562	.005	.235 (1.5x)	4	3/16	2	908956-C6	33.30
	.156 (5/32)		.1562	.005	.470 (3x)	4	3/16	2	936510-C6	33.30
	.156 (5/32)		.1562	.010	.235 (1.5x)	4	3/16	2	913010-C6	31.60
	.156 (5/32)		.1562	.010	.470 (3x)	4	3/16	2	950810-C6	31.60
	.156 (5/32)		.1562	.015	.125 (0.8x)	4	3/16	2	954310-C6	33.60
	.156 (5/32)		.1562	.015	.235 (1.5x)	4	3/16	2	52310-C6	33.30
	.156 (5/32)		.1562	.015	.470 (3x)	4	3/16	2	46910-C6	33.30
	.156 (5/32)		.1562	.015	.750 (5x)	4	3/16	3	53710-C6	43.10
	.156 (5/32)		.1562	.020	.470 (3x)	4	3/16	2	959310-C6	33.30
	.156 (5/32)		.1562	.025	.470 (3x)	4	3/16	2	848910-C6	33.30
	.156 (5/32)		.1562	.030	.235 (1.5x)	4	3/16	2	929410-C6	31.60
	.156 (5/32)		.1562	.030	.470 (3x)	4	3/16	2	943910-C6	31.60
	.156 (5/32)		.1562	.030	.750 (5x)	4	3/16	3	871510-C6	42.20

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" - .002"	+ .00 mm - .04 mm	decimal equivalent	+ .001" - .001" + .025 mm - .025 mm	+ .030" - .001" + .75 mm - .00 mm					
4.0 mm	.1574		.40 mm	6.00 mm (1.5x)	4	6 mm	63 mm	984161-C6	37.10
4.0 mm	.1574		.40 mm	12.00 mm (3x)	4	6 mm	63 mm	979361-C6	37.10
.187 (3/16)	.1875		.005	.285 (1.5x)	4	3/16	2	908910-C6	33.30
.187 (3/16)	.1875		.005	.562 (3x)	4	3/16	2	936512-C6	33.30
.187 (3/16)	.1875		.005	1.000 (5x)	4	3/16	3	869112-C6	42.70
.187 (3/16)	.1875		.008	.562 (3x)	4	3/16	2	848512-C6	33.30
.187 (3/16)	.1875		.010	.150 (0.8x)	4	3/16	2	763212-C6	34.90
.187 (3/16)	.1875		.010	.285 (1.5x)	4	3/16	2	913012-C6	31.60
.187 (3/16)	.1875		.010	.562 (3x)	4	3/16	2	950812-C6	31.60
.187 (3/16)	.1875		.010	1.000 (5x)	4	3/16	3	869912-C6	43.10
.187 (3/16)	.1875		.015	.150 (0.8x)	4	3/16	2	954312-C6	33.60
.187 (3/16)	.1875		.015	.285 (1.5x)	4	3/16	2	52312-C6	31.60
.187 (3/16)	.1875		.015	.562 (3x)	4	3/16	2	46912-C6	31.60
.187 (3/16)	.1875		.015	.750 (4x)	4	3/16	3	796412-C6	37.20
.187 (3/16)	.1875		.015	1.000 (5x)	4	3/16	3	53712-C6	43.10
.187 (3/16)	.1875		.020	.150 (0.8x)	4	3/16	2	816412-C6	40.80
.187 (3/16)	.1875		.020	.285 (1.5x)	4	3/16	2	931812-C6	37.40
.187 (3/16)	.1875		.020	.562 (3x)	4	3/16	2	959312-C6	37.40
.187 (3/16)	.1875		.020	1.000 (5x)	4	3/16	3	870712-C6	41.20
.187 (3/16)	.1875		.025	.285 (1.5x)	4	3/16	2	749412-C6	37.40
.187 (3/16)	.1875		.025	.562 (3x)	4	3/16	2	848912-C6	42.70
.187 (3/16)	.1875		.030	.285 (1.5x)	4	3/16	2	929412-C6	37.70
.187 (3/16)	.1875		.030	.562 (3x)	4	3/16	2	943912-C6	39.00
.187 (3/16)	.1875		.030	1.000 (5x)	4	3/16	3	871512-C6	42.70
.187 (3/16)	.1875		.040	.562 (3x)	4	3/16	2	844012-C6	39.70
.187 (3/16)	.1875		.045	.285 (1.5x)	4	3/16	2	857612-C6	39.70
.187 (3/16)	.1875		.045	.562 (3x)	4	3/16	2	864512-C6	39.70
.187 (3/16)	.1875		.060	.285 (1.5x)	4	3/16	2	845412-C6	37.40
.187 (3/16)	.1875		.060	.562 (3x)	4	3/16	2	885612-C6	37.40
.187 (3/16)	.1875		.060	1.000 (5x)	4	3/16	3	804412-C6	40.20
5.0 mm	.1968		.40 mm	7.50 mm (1.5x)	4	6 mm	63 mm	984164-C6	37.10
5.0 mm	.1968		.40 mm	15.00 mm (3x)	4	6 mm	63 mm	979364-C6	37.10
5.0 mm	.1968		1.00 mm	7.50 mm (1.5x)	4	6 mm	63 mm	752464-C6	37.10
5.0 mm	.1968		1.00 mm	15.00 mm (3x)	4	6 mm	63 mm	752964-C6	37.10
6.0 mm	.2362		.40 mm	9.00 mm (1.5x)	4	6 mm	63 mm	984166-C6	37.10
6.0 mm	.2362		.40 mm	18.00 mm (3x)	4	6 mm	63 mm	979366-C6	37.10
.250 (1/4)	.2500		.005	.375 (1.5x)	4	1/4	2-1/2	908916-C6	41.70
.250 (1/4)	.2500		.005	.750 (3x)	4	1/4	2-1/2	936516-C6	41.70
.250 (1/4)	.2500		.008	.750 (3x)	4	1/4	2-1/2	848516-C6	41.70
.250 (1/4)	.2500		.010	.375 (1.5x)	4	1/4	2-1/2	913016-C6	39.60
.250 (1/4)	.2500		.010	.750 (3x)	4	1/4	2-1/2	950816-C6	39.60
.250 (1/4)	.2500		.015	.200 (0.8x)	4	1/4	2-1/2	954316-C6	42.30
.250 (1/4)	.2500		.015	.375 (1.5x)	4	1/4	2-1/2	52316-C6	39.90
.250 (1/4)	.2500		.015	.750 (3x)	4	1/4	2-1/2	46916-C6	39.90
.250 (1/4)	.2500		.015	1.250 (5x)	4	1/4	4	53716-C6	53.30
.250 (1/4)	.2500		.020	.200 (0.8x)	4	1/4	2-1/2	816416-C6	47.50
.250 (1/4)	.2500		.020	.375 (1.5x)	4	1/4	2-1/2	931816-C6	45.40
.250 (1/4)	.2500		.020	.750 (3x)	4	1/4	2-1/2	959316-C6	45.40
.250 (1/4)	.2500		.025	.750 (3x)	4	1/4	2-1/2	848916-C6	45.40

NEW

NEW

NEW

continued on next page

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius (cont.)



continued from previous page

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
D ₁		decimal equivalent	R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" - .002"	+ .00mm - .04mm		+ .001" - .001" + .025mm - .025mm	+ .030" - .000" + .75mm - .00mm					
.250 (1/4)		.2500	.030	.375 (1.5x)	4	1/4	2-1/2	929416-C6	45.40
.250 (1/4)		.2500	.030	.750 (3x)	4	1/4	2-1/2	943916-C6	45.40
.250 (1/4)		.2500	.030	1.250 (5x)	4	1/4	4	871516-C6	50.20
.250 (1/4)		.2500	.040	.750 (3x)	4	1/4	2-1/2	844016-C6	48.10
.250 (1/4)		.2500	.045	.750 (3x)	4	1/4	2-1/2	864516-C6	48.10
.250 (1/4)		.2500	.060	.375 (1.5x)	4	1/4	2-1/2	845416-C6	45.40
.250 (1/4)		.2500	.060	.750 (3x)	4	1/4	2-1/2	885616-C6	45.40
.312 (5/16)		.3125	.015	.470 (1.5x)	4	5/16	2-1/2	52320-C6	57.60
.312 (5/16)		.3125	.015	1.000 (3x)	4	5/16	2-1/2	46920-C6	57.60
.375 (3/8)		.3750	.015	.570 (1.5x)	4	3/8	2-1/2	52324-C6	66.40
.375 (3/8)		.3750	.015	1.125 (3x)	4	3/8	2-1/2	46924-C6	66.40
.375 (3/8)		.3750	.020	.570 (1.5x)	4	3/8	2-1/2	931824-C6	71.90
.375 (3/8)		.3750	.030	.570 (1.5x)	4	3/8	2-1/2	929424-C6	71.90
.375 (3/8)		.3750	.030	1.125 (3x)	4	3/8	2-1/2	943924-C6	71.90
.375 (3/8)		.3750	.040	1.125 (3x)	4	3/8	2-1/2	844024-C6	71.90
.500 (1/2)		.5000	.015	.750 (1.5x)	4	1/2	3	816232-C6	85.80
.500 (1/2)		.5000	.030	.750 (1.5x)	4	1/2	3	52332-C6	85.80

HIGH TEMP ALLOYS

SPEEDS & FEEDS (Variable Helix for High Temp Alloys)

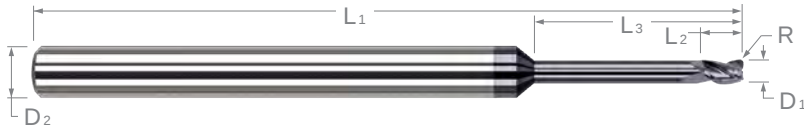
Important Note: Values in table are in inches and are based on 4 flute, standard (3x Dia) length of cut end mills. For 3 flutes, table values of IPT must be increased to 105% before adjustments for different lengths of cut. For shorter lengths of cut, table values of IPT must be increased (for 0.8x, increase to 115%; for 1.5x, increase to 108%). For longer lengths of cut, table values of IPT must be reduced (for 4x, reduce to 85%; for 5x, reduce to 70%). For complete speeds and feeds charts, please see www.harveytool.com.

Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter											
			.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500
Stainless Steels: 40x, 41x, 42x, 43x, 44x, 13-8, 15-5, 15-7, 17-4, 17-7	275 - 300	160												
	300 - 350	140												
	350 - 400	100												
	400 - 425	80												
Titanium: All alloys	275 - 300	200												
	300 - 350	125												
	350 - 400	75												
	400 - 425	75												
Nickel Alloys: Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	275 - 300	80												
	300 - 350	60												
	350 - 400	50												
	400 - 425	40												
			Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: .1x Dia											
			Axial Depth of Cut*: Slotting: .4x Dia Roughing: .5x - .7x Dia Finishing: .5x - 1x Dia											

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius – Long Reach, Stub Flute



Reduced Neck Diameter to Avoid Heeling

- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 34°) reduces chatter and harmonics and increases material removal rates
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- Suitable for steels up to 45Rc
- Center cutting
- Solid carbide
- CNC ground in the USA

HIGH TEMP ALLOYS

mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D1			R	L2	L3		D2 (h6)	L1	TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .001" / - .001" / + .025mm / - .025mm	+ .010" / - .000" / + .25mm / - .00mm	+ .010" / - .000" / + .25mm / - .00mm					
.015 (1/64)	.0150		.003	.022	.045 (3x)	3	1/8	1-1/2	947615-C6	58.90
.015 (1/64)	.0150		.003	.022	.078 (5x)	3	1/8	2-1/2	64415-C6	58.90
.015 (1/64)	.0150		.003	.022	.125 (8x)	3	1/8	2-1/2	54815-C6	60.10
.015 (1/64)	.0150		.003	.022	.187 (12x)	3	1/8	2-1/2	63015-C6	65.80
.015 (1/64)	.0150		.003	.022	.225 (15x)	3	1/8	2-1/2	968915-C6	71.70
.4 mm	.0157		.08 mm	.60 mm	2.0 mm (5x)	3	4 mm	50 mm	980709-C6	65.80
.4 mm	.0157		.08 mm	.60 mm	3.2 mm (8x)	3	4 mm	50 mm	975009-C6	67.20
.4 mm	.0157		.08 mm	.60 mm	4.8 mm (12x)	3	4 mm	50 mm	987309-C6	71.70
.5 mm	.0196		.10 mm	.75 mm	2.5 mm (5x)	3	4 mm	50 mm	980711-C6	63.10
.5 mm	.0196		.10 mm	.75 mm	4.0 mm (8x)	3	4 mm	50 mm	975011-C6	64.50
.5 mm	.0196		.10 mm	.75 mm	6.0 mm (12x)	3	4 mm	50 mm	987311-C6	69.70
.5 mm	.0196		.10 mm	.75 mm	8.0 mm (16x)	3	4 mm	50 mm	971511-C6	72.80
.020	.0200		.004	.030	.060 (3x)	3	1/8	1-1/2	947620-C6	56.00
.020	.0200		.004	.030	.100 (5x)	3	1/8	2-1/2	64420-C6	56.20
.020	.0200		.004	.030	.160 (8x)	3	1/8	2-1/2	54820-C6	57.50
.020	.0200		.004	.030	.200 (10x)	3	1/8	2-1/2	932520-C6	60.40
.020	.0200		.004	.030	.250 (12x)	3	1/8	2-1/2	63020-C6	63.40
.6 mm	.0236		.10 mm	.90 mm	3.0 mm (5x)	3	4 mm	50 mm	980713-C6	62.00
.6 mm	.0236		.10 mm	.90 mm	4.8 mm (8x)	3	4 mm	50 mm	975013-C6	63.10
.6 mm	.0236		.10 mm	.90 mm	7.2 mm (12x)	3	4 mm	50 mm	987313-C6	67.40
.025	.0250		.004	.038	.075 (3x)	3	1/8	1-1/2	947625-C6	54.30
.025	.0250		.004	.038	.125 (5x)	3	1/8	2-1/2	64425-C6	55.00
.025	.0250		.004	.038	.203 (8x)	3	1/8	2-1/2	54825-C6	56.00
.025	.0250		.004	.038	.312 (12x)	3	1/8	2-1/2	63025-C6	61.90
.031 (1/32)	.0310		.005	.047	.093 (3x)	3	1/8	1-1/2	947631-C6	51.80
.031 (1/32)	.0310		.005	.047	.156 (5x)	3	1/8	2-1/2	64431-C6	52.10
.031 (1/32)	.0310		.005	.047	.156 (5x)	4	1/8	2-1/2	812131-C6	54.10
.031 (1/32)	.0310		.005	.047	.187 (6x)	3	1/8	2-1/2	796131-C6	54.10
.031 (1/32)	.0310		.005	.047	.250 (8x)	3	1/8	2-1/2	54831-C6	53.30
.031 (1/32)	.0310		.005	.047	.312 (10x)	3	1/8	2-1/2	932531-C6	54.60
.031 (1/32)	.0310		.005	.047	.375 (12x)	3	1/8	2-1/2	63031-C6	55.60
.031 (1/32)	.0310		.005	.047	.470 (15x)	3	1/8	2-1/2	968931-C6	60.90
.031 (1/32)	.0310		.010	.047	.156 (5x)	3	1/8	2-1/2	917331-C6	51.50
.031 (1/32)	.0310		.010	.047	.250 (8x)	3	1/8	2-1/2	908631-C6	53.30
.8 mm	.0314		.10 mm	1.20 mm	4.0 mm (5x)	3	4 mm	50 mm	980718-C6	57.00
.8 mm	.0314		.10 mm	1.20 mm	6.5 mm (8x)	3	4 mm	50 mm	975018-C6	58.50
.8 mm	.0314		.10 mm	1.20 mm	9.5 mm (12x)	3	4 mm	50 mm	987318-C6	60.10

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius – Long Reach, Stub Flute (cont.)



continued from previous page

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00mm - .02mm	decimal equivalent	+ .001" - .001" + .025mm - .025mm	+ .010" - .000" + .25mm - .00mm	+ .010" - .000" + .25mm - .00mm					
.035		.0350	.005	.053	.105 (3x)	3	1/8	1-1/2	947635-C6	51.80
.035		.0350	.005	.053	.187 (5x)	3	1/8	2-1/2	64435-C6	52.10
.035		.0350	.005	.053	.281 (8x)	3	1/8	2-1/2	54835-C6	53.30
.035		.0350	.005	.053	.350 (10x)	3	1/8	2-1/2	932535-C6	55.60
1.0 mm		.0393	.10 mm	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	980722-C6	57.00
1.0 mm		.0393	.10 mm	1.50 mm	8.0 mm (8x)	3	4 mm	50 mm	975022-C6	58.50
1.0 mm		.0393	.10 mm	1.50 mm	12.0 mm (12x)	3	4 mm	50 mm	987322-C6	60.10
1.0 mm		.0393	.10 mm	1.50 mm	16.0 mm (16x)	3	4 mm	50 mm	971522-C6	63.40
.040		.0400	.005	.060	.120 (3x)	3	1/8	1-1/2	947640-C6	51.80
.040		.0400	.005	.060	.203 (5x)	3	1/8	2-1/2	64440-C6	52.10
.040		.0400	.005	.060	.325 (8x)	3	1/8	2-1/2	54840-C6	53.30
.045		.0450	.005	.068	.135 (3x)	3	1/8	1-1/2	947645-C6	51.80
.045		.0450	.005	.068	.225 (5x)	3	1/8	2-1/2	64445-C6	52.10
.045		.0450	.005	.068	.375 (8x)	3	1/8	2-1/2	54845-C6	53.30
.047 (3/64)		.0470	.005	.070	.141 (3x)	3	1/8	1-1/2	947647-C6	51.80
.047 (3/64)		.0470	.005	.070	.250 (5x)	3	1/8	2-1/2	64447-C6	52.10
.047 (3/64)		.0470	.005	.070	.281 (6x)	3	1/8	2-1/2	796147-C6	52.10
.047 (3/64)		.0470	.005	.070	.375 (8x)	3	1/8	2-1/2	54847-C6	53.30
.047 (3/64)		.0470	.005	.070	.570 (12x)	3	1/8	2-1/2	63047-C6	55.60
.047 (3/64)		.0470	.005	.070	.710 (15x)	3	1/8	2-1/2	968947-C6	60.90
.047 (3/64)		.0470	.010	.070	.250 (5x)	3	1/8	2-1/2	917347-C6	52.10
.047 (3/64)		.0470	.010	.070	.375 (8x)	3	1/8	2-1/2	908647-C6	53.30
.050		.0500	.005	.075	.150 (3x)	3	1/8	1-1/2	947650-C6	51.80
.050		.0500	.005	.075	.250 (5x)	3	1/8	2-1/2	64450-C6	52.10
.050		.0500	.005	.075	.400 (8x)	3	1/8	2-1/2	54850-C6	53.30
.055		.0550	.005	.083	.275 (5x)	3	1/8	2-1/2	64455-C6	52.10
.055		.0550	.005	.083	.450 (8x)	3	1/8	2-1/2	54855-C6	53.30
1.5 mm		.0590	.20 mm	2.20 mm	7.5 mm (5x)	3	4 mm	50 mm	980733-C6	57.00
1.5 mm		.0590	.20 mm	2.20 mm	12.0 mm (8x)	3	4 mm	50 mm	975033-C6	58.50
1.5 mm		.0590	.20 mm	2.20 mm	18.0 mm (12x)	3	4 mm	50 mm	987333-C6	60.10
1.5 mm		.0590	.20 mm	2.20 mm	24.0 mm (16x)	3	4 mm	63 mm	971533-C6	63.40
.060		.0600	.005	.090	.312 (5x)	3	1/8	2-1/2	919860-C6	52.10
.060		.0600	.005	.090	.500 (8x)	3	1/8	2-1/2	915360-C6	53.30
.060		.0600	.010	.090	.312 (5x)	3	1/8	2-1/2	64460-C6	52.10
.060		.0600	.010	.090	.500 (8x)	3	1/8	2-1/2	54860-C6	53.30
.060		.0600	.010	.090	.625 (10x)	3	1/8	2-1/2	932560-C6	55.60
.062 (1/16)		.0620	.005	.093	.312 (5x)	3	1/8	2-1/2	919862-C6	51.50
.062 (1/16)		.0620	.005	.093	.500 (8x)	3	1/8	2-1/2	915362-C6	53.30
.062 (1/16)		.0620	.005	.093	.625 (10x)	3	1/8	2-1/2	884462-C6	53.90
.062 (1/16)		.0620	.010	.093	.186 (3x)	3	1/8	1-1/2	947662-C6	51.50
.062 (1/16)		.0620	.010	.093	.312 (5x)	3	1/8	2-1/2	64462-C6	52.10
.062 (1/16)		.0620	.010	.093	.312 (5x)	4	1/8	2-1/2	811862-C6	54.10
.062 (1/16)		.0620	.010	.093	.375 (6x)	3	1/8	2-1/2	795962-C6	54.10
.062 (1/16)		.0620	.010	.093	.500 (8x)	3	1/8	2-1/2	54862-C6	53.30
.062 (1/16)		.0620	.010	.093	.625 (10x)	3	1/8	2-1/2	932562-C6	54.60
.062 (1/16)		.0620	.010	.093	.750 (12x)	3	1/8	2-1/2	63062-C6	55.60
.062 (1/16)		.0620	.010	.093	.950 (15x)	3	1/8	2-1/2	968962-C6	60.90

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HIGH TEMP ALLOYS

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius – Long Reach, Stub Flute (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005"	+ .00 mm	decimal	+ .001"	+ .010"	+ .010"					
- .0005"	- .02 mm	equivalent	- .001"	- .000"	- .000"					
			+ .025 mm	+ .25 mm	+ .25 mm					
			- .025 mm	- .00 mm	- .00 mm					
.062 (1/16)	.0620		.015	.093	.312 (5x)	3	1/8	2-1/2	902662-C6	51.50
.062 (1/16)	.0620		.015	.093	.500 (8x)	3	1/8	2-1/2	912062-C6	53.30
.062 (1/16)	.0620		.020	.093	.312 (5x)	3	1/8	2-1/2	866862-C6	51.50
.062 (1/16)	.0620		.020	.093	.500 (8x)	3	1/8	2-1/2	847562-C6	53.30
.078 (5/64)	.0780		.005	.117	.406 (5x)	3	1/8	2-1/2	919878-C6	52.10
.078 (5/64)	.0780		.005	.117	.625 (8x)	3	1/8	2-1/2	915378-C6	53.30
.078 (5/64)	.0780		.010	.117	.234 (3x)	3	1/8	1-1/2	947678-C6	51.50
.078 (5/64)	.0780		.010	.117	.406 (5x)	3	1/8	2-1/2	64478-C6	52.10
.078 (5/64)	.0780		.010	.117	.406 (5x)	4	1/8	2-1/2	811878-C6	54.10
.078 (5/64)	.0780		.010	.117	.475 (6x)	3	1/8	2-1/2	795978-C6	52.10
.078 (5/64)	.0780		.010	.117	.625 (8x)	3	1/8	2-1/2	54878-C6	53.30
.078 (5/64)	.0780		.010	.117	.940 (12x)	3	1/8	2-1/2	63078-C6	55.60
.078 (5/64)	.0780		.010	.117	1.187 (15x)	3	1/8	2-1/2	968978-C6	60.90
2.0 mm	.0787		.20 mm	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	980745-C6	57.00
2.0 mm	.0787		.20 mm	3.00 mm	16.0 mm (8x)	3	4 mm	50 mm	975045-C6	58.50
2.0 mm	.0787		.20 mm	3.00 mm	24.0 mm (12x)	3	4 mm	63 mm	987345-C6	60.10
2.0 mm	.0787		.20 mm	3.00 mm	32.0 mm (16x)	3	4 mm	63 mm	971545-C6	63.40
.093 (3/32)	.0930		.005	.139	.500 (5x)	3	1/8	2-1/2	919893-C6	51.50
.093 (3/32)	.0930		.005	.139	.750 (8x)	3	1/8	2-1/2	915393-C6	53.30
.093 (3/32)	.0930		.010	.139	.279 (3x)	3	1/8	1-1/2	947693-C6	51.50
.093 (3/32)	.0930		.010	.139	.500 (5x)	3	1/8	2-1/2	64493-C6	52.10
.093 (3/32)	.0930		.010	.139	.500 (5x)	4	1/8	2-1/2	811893-C6	54.10
.093 (3/32)	.0930		.010	.139	.585 (6x)	3	1/8	2-1/2	795993-C6	52.10
.093 (3/32)	.0930		.010	.139	.750 (8x)	3	1/8	2-1/2	54893-C6	53.30
.093 (3/32)	.0930		.010	.139	.950 (10x)	3	1/8	2-1/2	932593-C6	54.60
.093 (3/32)	.0930		.010	.139	1.125 (12x)	3	1/8	2-1/2	63093-C6	55.60
.093 (3/32)	.0930		.010	.139	1.400 (15x)	3	1/8	3	968993-C6	60.90
.093 (3/32)	.0930		.015	.139	.500 (5x)	3	1/8	2-1/2	902693-C6	51.50
.093 (3/32)	.0930		.015	.139	.750 (8x)	3	1/8	2-1/2	912093-C6	53.30
.093 (3/32)	.0930		.020	.139	.500 (5x)	3	1/8	2-1/2	866893-C6	51.50
.093 (3/32)	.0930		.020	.139	.750 (8x)	3	1/8	2-1/2	847593-C6	53.30
.093 (3/32)	.0930		.030	.139	.500 (5x)	3	1/8	2-1/2	910193-C6	51.50
.093 (3/32)	.0930		.030	.139	.750 (8x)	3	1/8	2-1/2	906493-C6	53.30
.100	.1000		.010	.150	.500 (5x)	3	1/8	2-1/2	64500-C6	51.50
.100	.1000		.010	.150	.800 (8x)	3	1/8	2-1/2	54900-C6	52.90
3.0 mm	.1181		.20 mm	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	980757-C6	54.10
3.0 mm	.1181		.20 mm	4.50 mm	24.0 mm (8x)	3	4 mm	50 mm	975057-C6	54.20

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Access **Simulation Files** in DXF format for every Harvey Tool product, downloadable from [Harveytool.com](https://www.harveytool.com)

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Corner Radius – Long Reach, Stub Flute (cont.)



continued from previous page

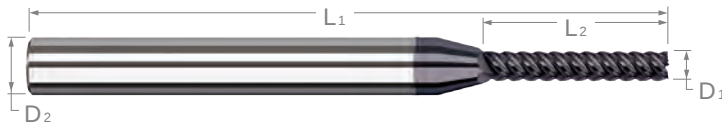
CUTTER DIAMETER		CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
D ₁ $\begin{smallmatrix} +.000" \\ -.002" \end{smallmatrix}$	decimal equivalent	R $\begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	L ₂ $\begin{smallmatrix} +.030" \\ -.000" \end{smallmatrix}$	L ₃ $\begin{smallmatrix} +.030" \\ -.000" \end{smallmatrix}$		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)	.1250	.005	.187	.625 (5x)	4	1/8	2-1/2	919908-C6	48.50
.125 (1/8)	.1250	.005	.187	1.000 (8x)	4	1/8	2-1/2	915408-C6	50.20
.125 (1/8)	.1250	.010	.187	.625 (5x)	4	1/8	2-1/2	917408-C6	51.10
.125 (1/8)	.1250	.010	.187	1.000 (8x)	4	1/8	2-1/2	908708-C6	52.90
.125 (1/8)	.1250	.015	.187	.375 (3x)	4	1/8	1-1/2	947708-C6	49.20
.125 (1/8)	.1250	.015	.187	.625 (5x)	4	1/8	2-1/2	64508-C6	51.50
.125 (1/8)	.1250	.015	.187	.750 (6x)	4	1/8	2-1/2	795808-C6	51.50
.125 (1/8)	.1250	.015	.187	1.000 (8x)	4	1/8	2-1/2	54908-C6	52.90
.125 (1/8)	.1250	.015	.187	1.250 (10x)	4	1/8	2-1/2	932608-C6	54.60
.125 (1/8)	.1250	.015	.187	1.500 (12x)	4	1/8	3	63108-C6	55.60
.125 (1/8)	.1250	.020	.187	.625 (5x)	4	1/8	2-1/2	866908-C6	51.10
.125 (1/8)	.1250	.020	.187	1.000 (8x)	4	1/8	2-1/2	847608-C6	52.90
.125 (1/8)	.1250	.030	.187	.625 (5x)	4	1/8	2-1/2	910208-C6	51.10
.125 (1/8)	.1250	.030	.187	1.000 (8x)	4	1/8	2-1/2	906508-C6	52.90
.140 (9/64)	.1406	.015	.220	.750 (5x)	4	3/16	3	64509-C6	56.90
.140 (9/64)	.1406	.015	.220	1.125 (8x)	4	3/16	3	54909-C6	58.10
.156 (5/32)	.1562	.010	.235	.750 (5x)	4	3/16	3	917410-C6	56.90
.156 (5/32)	.1562	.015	.235	.750 (5x)	4	3/16	3	64510-C6	56.90
.156 (5/32)	.1562	.015	.235	1.250 (8x)	4	3/16	3	54910-C6	58.10
.156 (5/32)	.1562	.015	.235	1.875 (12x)	4	3/16	4	63110-C6	69.80
.156 (5/32)	.1562	.030	.235	.750 (5x)	4	3/16	3	910210-C6	56.90
.187 (3/16)	.1875	.005	.281	1.000 (5x)	4	3/16	3	919912-C6	54.80
.187 (3/16)	.1875	.005	.281	1.500 (8x)	4	3/16	3	915412-C6	56.10
.187 (3/16)	.1875	.010	.281	1.000 (5x)	4	3/16	3	917412-C6	57.50
.187 (3/16)	.1875	.010	.281	1.500 (8x)	4	3/16	3	908712-C6	58.90
.187 (3/16)	.1875	.015	.281	1.000 (5x)	4	3/16	3	64512-C6	57.50
.187 (3/16)	.1875	.015	.281	1.156 (6x)	4	3/16	3	795812-C6	57.50
.187 (3/16)	.1875	.015	.281	1.500 (8x)	4	3/16	3	54912-C6	58.90
.187 (3/16)	.1875	.015	.281	1.875 (10x)	4	3/16	4	932612-C6	68.00
.187 (3/16)	.1875	.015	.281	2.250 (12x)	4	3/16	4	63112-C6	69.80
.187 (3/16)	.1875	.020	.281	1.000 (5x)	4	3/16	3	866912-C6	57.10
.187 (3/16)	.1875	.020	.281	1.500 (8x)	4	3/16	3	847612-C6	58.50
.187 (3/16)	.1875	.030	.281	1.000 (5x)	4	3/16	3	910212-C6	57.10
.187 (3/16)	.1875	.030	.281	1.500 (8x)	4	3/16	3	906512-C6	58.50
.187 (3/16)	.1875	.040	.281	1.000 (5x)	4	3/16	3	785612-C6	57.10
.187 (3/16)	.1875	.040	.281	1.500 (8x)	4	3/16	3	785412-C6	58.50
.250 (1/4)	.2500	.015	.375	1.250 (5x)	4	1/4	4	64516-C6	63.90
.250 (1/4)	.2500	.015	.375	2.000 (8x)	4	1/4	4	54916-C6	64.90
.250 (1/4)	.2500	.015	.375	3.000 (12x)	4	1/4	6	63116-C6	78.10
.250 (1/4)	.2500	.030	.375	1.250 (5x)	4	1/4	4	910216-C6	63.50
.250 (1/4)	.2500	.030	.375	2.000 (8x)	4	1/4	4	906516-C6	64.50
.375 (3/8)	.3750	.015	.570	2.000 (5x)	4	3/8	4	64524-C6	71.80

HIGH TEMP ALLOYS

PLEASE SEE SPEEDS & FEEDS ON PAGE 131

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square



**Up to 7
Flutes!**

- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Variable helix design (approx. 41°) reduces chatter and harmonics improving finish
- Large core and eccentric relief for improved tool life
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- End cutting (not center cutting) Solid carbide CNC ground in the USA

mm & in

CUTTER DIAMETER	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁ +.0005" +.00mm decimal -.0005" -.02mm equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.2 mm .0078	.60 mm (3x)	4	4 mm	50 mm	967604-C6	57.00
.2 mm .0078	1.00 mm (5x)	4	4 mm	50 mm	974504-C6	65.50
.2 mm .0078	1.60 mm (8x)	4	4 mm	50 mm	976104-C6	67.20
.010 .0100	.030 (3x)	4	1/8	1-1/2	57810-C6	56.20
.010 .0100	.050 (5x)	4	1/8	2-1/2	62610-C6	64.50
.3 mm .0118	.90 mm (3x)	4	4 mm	50 mm	967606-C6	52.60
.015 (1/64) .0150	.023 (1.5x)	4	1/8	1-1/2	946115-C6	44.80
.015 (1/64) .0150	.045 (3x)	4	1/8	1-1/2	57815-C6	44.80
.015 (1/64) .0150	.062 (4x)	4	1/8	2-1/2	890115-C6	55.60
.015 (1/64) .0150	.078 (5x)	4	1/8	2-1/2	62615-C6	55.60
.015 (1/64) .0150	.125 (8x)	4	1/8	2-1/2	59015-C6	57.10
.015 (1/64) .0150	.156 (10x)	4	1/8	2-1/2	941815-C6	66.70
.4 mm .0157	1.20 mm (3x)	4	4 mm	50 mm	967609-C6	50.00
.4 mm .0157	2.00 mm (5x)	4	4 mm	50 mm	974509-C6	58.60
.4 mm .0157	3.20 mm (8x)	4	4 mm	50 mm	976109-C6	60.40
.5 mm .0196	1.50 mm (3x)	4	4 mm	50 mm	967611-C6	50.00
.5 mm .0196	2.50 mm (5x)	4	4 mm	50 mm	974511-C6	57.80
.5 mm .0196	4.00 mm (8x)	4	4 mm	50 mm	976111-C6	59.30
.020 .0200	.030 (1.5x)	4	1/8	1-1/2	946120-C6	43.90
.020 .0200	.060 (3x)	4	1/8	1-1/2	57820-C6	43.90
.020 .0200	.080 (4x)	4	1/8	2-1/2	890120-C6	55.30
.020 .0200	.100 (5x)	4	1/8	2-1/2	62620-C6	55.30
.020 .0200	.160 (8x)	4	1/8	2-1/2	59020-C6	56.90
.020 .0200	.200 (10x)	4	1/8	2-1/2	941820-C6	66.10
.6 mm .0236	1.80 mm (3x)	4	4 mm	50 mm	967613-C6	50.00
.6 mm .0236	3.00 mm (5x)	4	4 mm	50 mm	974513-C6	57.80
.6 mm .0236	4.80 mm (8x)	4	4 mm	50 mm	976113-C6	59.30
.025 .0250	.075 (3x)	4	1/8	1-1/2	57825-C6	41.20
.025 .0250	.125 (5x)	4	1/8	2-1/2	62625-C6	53.30
.025 .0250	.203 (8x)	4	1/8	2-1/2	59025-C6	55.00
.025 .0250	.250 (10x)	4	1/8	2-1/2	941825-C6	64.30
.7 mm .0275	2.10 mm (3x)	4	4 mm	50 mm	967615-C6	49.80
.030 .0300	.090 (3x)	6	1/8	1-1/2	57830-C6	41.20
.030 .0300	.156 (5x)	6	1/8	2-1/2	62630-C6	53.30

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" -.0005"	+ .00mm -.02mm	decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.031 (1/32)		.0310	.047 (1.5x)	6	1/8	1-1/2	946131-C6	36.90
.031 (1/32)		.0310	.093 (3x)	6	1/8	1-1/2	57831-C6	36.90
.031 (1/32)		.0310	.125 (4x)	6	1/8	2-1/2	890131-C6	51.00
.031 (1/32)		.0310	.156 (5x)	6	1/8	2-1/2	62631-C6	51.00
.031 (1/32)		.0310	.187 (6x)	6	1/8	2-1/2	868531-C6	51.60
.031 (1/32)		.0310	.218 (7x)	6	1/8	2-1/2	881331-C6	51.60
.031 (1/32)		.0310	.250 (8x)	6	1/8	2-1/2	59031-C6	52.50
.031 (1/32)		.0310	.312 (10x)	6	1/8	2-1/2	941831-C6	61.60
.031 (1/31)		.0310	.375 (12x)	6	1/8	2-1/2	69131-C6	66.10
.8 mm		.0314	2.40 mm (3x)	6	4 mm	50 mm	967618-C6	44.90
.8 mm		.0314	4.00 mm (5x)	6	4 mm	50 mm	974518-C6	52.60
.8 mm		.0314	6.50 mm (8x)	6	4 mm	50 mm	976118-C6	54.20
.035		.0350	.105 (3x)	6	1/8	1-1/2	57835-C6	39.70
.035		.0350	.187 (5x)	6	1/8	2-1/2	62635-C6	41.60
.9 mm		.0354	2.70 mm (3x)	6	4 mm	50 mm	967620-C6	43.70
1.0 mm		.0393	1.50 mm (1.5x)	6	4 mm	50 mm	846722-C6	43.70
1.0 mm		.0393	3.00 mm (3x)	6	4 mm	50 mm	967622-C6	43.70
1.0 mm		.0393	5.00 mm (5x)	6	4 mm	50 mm	974522-C6	54.10
1.0 mm		.0393	8.00 mm (8x)	6	4 mm	50 mm	976122-C6	56.70
1.0 mm		.0393	10.00 mm (10x)	6	4 mm	50 mm	938322-C6	63.90
.040		.0400	.060 (1.5x)	6	1/8	1-1/2	946140-C6	36.90
.040		.0400	.120 (3x)	6	1/8	1-1/2	57840-C6	36.90
.040		.0400	.160 (4x)	6	1/8	2-1/2	890140-C6	51.00
.040		.0400	.203 (5x)	6	1/8	2-1/2	62640-C6	51.00
.040		.0400	.240 (6x)	6	1/8	2-1/2	868540-C6	51.60
.040		.0400	.325 (8x)	6	1/8	2-1/2	59040-C6	52.50
1.1 mm		.0433	3.00 mm (3x)	6	4 mm	50 mm	967624-C6	42.10
.045		.0450	.135 (3x)	6	1/8	1-1/2	57845-C6	39.70
.045		.0450	.225 (5x)	6	1/8	2-1/2	62645-C6	41.60
.047 (3/64)		.0470	.071 (1.5x)	6	1/8	1-1/2	946147-C6	37.80
.047 (3/64)		.0470	.141 (3x)	6	1/8	1-1/2	57847-C6	36.90
.047 (3/64)		.0470	.187 (4x)	6	1/8	2-1/2	890147-C6	51.00
.047 (3/64)		.0470	.250 (5x)	6	1/8	2-1/2	62647-C6	51.00
.047 (3/64)		.0470	.281 (6x)	6	1/8	2-1/2	868547-C6	51.60
.047 (3/64)		.0470	.328 (7x)	6	1/8	2-1/2	881347-C6	51.60
.047 (3/64)		.0470	.375 (8x)	6	1/8	2-1/2	59047-C6	52.50
.047 (3/64)		.0470	.480 (10x)	6	1/8	2-1/2	941847-C6	61.60
.047 (3/64)		.0470	.570 (12x)	6	1/8	2-1/2	69147-C6	66.10
1.2 mm		.0472	3.50 mm (3x)	6	4 mm	50 mm	967627-C6	43.70
1.2 mm		.0472	6.00 mm (5x)	6	4 mm	50 mm	974527-C6	54.10
1.2 mm		.0472	9.50 mm (8x)	6	4 mm	50 mm	976127-C6	56.70
.050		.0500	.075 (1.5x)	7	1/8	1-1/2	946150-C6	37.80
.050		.0500	.150 (3x)	7	1/8	1-1/2	57850-C6	36.90
.050		.0500	.250 (5x)	7	1/8	2-1/2	62650-C6	51.00
.050		.0500	.400 (8x)	7	1/8	2-1/2	59050-C6	52.50

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)



continued from previous page

HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .010" / - .000" / + .25mm / - .00mm					
1.3 mm	.0511		4.00 mm (3x)	7	4 mm	50 mm	967629-C6	43.70
.055	.0550		.165 (3x)	7	1/8	1-1/2	57855-C6	39.10
.055	.0550		.275 (5x)	7	1/8	2-1/2	62655-C6	40.50
1.4 mm	.0551		4.00 mm (3x)	7	4 mm	50 mm	967631-C6	43.70
1.4 mm	.0551		7.00 mm (5x)	7	4 mm	50 mm	974531-C6	54.10
1.4 mm	.0551		11.00 mm (8x)	7	4 mm	50 mm	976131-C6	56.70
1.5 mm	.0590		2.20 mm (1.5x)	7	4 mm	50 mm	846733-C6	42.20
1.5 mm	.0590		4.50 mm (3x)	7	4 mm	50 mm	967633-C6	42.20
1.5 mm	.0590		7.50 mm (5x)	7	4 mm	50 mm	974533-C6	52.60
1.5 mm	.0590		12.00 mm (8x)	7	4 mm	50 mm	976133-C6	55.10
1.5 mm	.0590		15.00 mm (10x)	7	4 mm	50 mm	938333-C6	65.20
.060	.0600		.090 (1.5x)	7	1/8	1-1/2	946160-C6	36.40
.060	.0600		.180 (3x)	7	1/8	1-1/2	57860-C6	36.40
.060	.0600		.312 (5x)	7	1/8	2-1/2	62660-C6	47.10
.060	.0600		.500 (8x)	7	1/8	2-1/2	59060-C6	48.70
.062 (1/16)	.0620		.093 (1.5x)	7	1/8	1-1/2	946162-C6	36.40
.062 (1/16)	.0620		.186 (3x)	7	1/8	1-1/2	57862-C6	36.40
.062 (1/16)	.0620		.250 (4x)	7	1/8	2-1/2	890162-C6	48.10
.062 (1/16)	.0620		.312 (5x)	7	1/8	2-1/2	62662-C6	48.10
.062 (1/16)	.0620		.375 (6x)	7	1/8	2-1/2	868562-C6	48.80
.062 (1/16)	.0620		.437 (7x)	7	1/8	2-1/2	881362-C6	48.80
.062 (1/16)	.0620		.500 (8x)	7	1/8	2-1/2	59062-C6	49.60
.062 (1/16)	.0620		.625 (10x)	7	1/8	2-1/2	941862-C6	62.70
.062 (1/16)	.0620		.750 (12x)	7	1/8	2-1/2	69162-C6	70.40
.062 (1/16)	.0620		.950 (15x)	7	1/8	2-1/2	68762-C6	88.60
1.6 mm	.0629		5.00 mm (3x)	7	4 mm	50 mm	967636-C6	42.20
1.6 mm	.0629		8.00 mm (5x)	7	4 mm	50 mm	974536-C6	52.60
1.6 mm	.0629		13.00 mm (8x)	7	4 mm	50 mm	976136-C6	55.10
1.7 mm	.0669		5.00 mm (3x)	7	4 mm	50 mm	967638-C6	42.20
.070	.0700		.210 (3x)	7	1/8	1-1/2	57870-C6	34.40
.070	.0700		.375 (5x)	7	1/8	2-1/2	62670-C6	48.10
.070	.0700		.570 (8x)	7	1/8	2-1/2	59070-C6	49.60
1.8 mm	.0708		5.50 mm (3x)	7	4 mm	50 mm	967640-C6	42.20
1.8 mm	.0708		9.00 mm (5x)	7	4 mm	50 mm	974540-C6	52.60
1.8 mm	.0708		14.00 mm (8x)	7	4 mm	50 mm	976140-C6	55.10
1.9 mm	.0748		5.50 mm (3x)	7	4 mm	50 mm	967642-C6	42.20
.078 (5/64)	.0780		.117 (1.5x)	7	1/8	1-1/2	946178-C6	34.40
.078 (5/64)	.0780		.234 (3x)	7	1/8	1-1/2	57878-C6	34.40
.078 (5/64)	.0780		.312 (4x)	7	1/8	2-1/2	890178-C6	48.10
.078 (5/64)	.0780		.406 (5x)	7	1/8	2-1/2	62678-C6	48.10
.078 (5/64)	.0780		.475 (6x)	7	1/8	2-1/2	868578-C6	48.80
.078 (5/64)	.0780		.550 (7x)	7	1/8	2-1/2	881378-C6	48.80
.078 (5/64)	.0780		.625 (8x)	7	1/8	2-1/2	59078-C6	49.60
.078 (5/64)	.0780		.800 (10x)	7	1/8	2-1/2	941878-C6	62.70

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00 mm - .02 mm	decimal equivalent	+ .010" - .000" + .25 mm - .00 mm					
.078 (5/64)	.0780		.940 (12x)	7	1/8	2-1/2	69178-C6	70.40
.078 (5/64)	.0780		1.187 (15x)	7	1/8	2-1/2	68778-C6	88.60
2.0 mm	.0787		3.00 mm (1.5x)	7	4 mm	50 mm	846745-C6	42.20
2.0 mm	.0787		6.00 mm (3x)	7	4 mm	50 mm	967645-C6	42.20
2.0 mm	.0787		10.00 mm (5x)	7	4 mm	50 mm	974545-C6	52.30
2.0 mm	.0787		16.00 mm (8x)	7	4 mm	50 mm	976145-C6	54.80
.080	.0800		.120 (1.5x)	7	1/8	1-1/2	946180-C6	36.40
.080	.0800		.240 (3x)	7	1/8	1-1/2	57880-C6	34.40
.080	.0800		.406 (5x)	7	1/8	2-1/2	62680-C6	48.10
.080	.0800		.650 (8x)	7	1/8	2-1/2	59080-C6	49.60
.090	.0900		.270 (3x)	7	1/8	1-1/2	57890-C6	34.40
.090	.0900		.450 (5x)	7	1/8	2-1/2	62690-C6	48.10
.090	.0900		.750 (8x)	7	1/8	2-1/2	59090-C6	49.60
.093 (3/32)	.0930		.074 (0.8x)	7	1/8	1-1/2	836593-C6	37.40
.093 (3/32)	.0930		.140 (1.5x)	7	1/8	1-1/2	946193-C6	34.40
.093 (3/32)	.0930		.279 (3x)	7	1/8	1-1/2	57893-C6	34.40
.093 (3/32)	.0930		.375 (4x)	7	1/8	2-1/2	890193-C6	48.10
.093 (3/32)	.0930		.500 (5x)	7	1/8	2-1/2	62693-C6	48.10
.093 (3/32)	.0930		.585 (6x)	7	1/8	2-1/2	868593-C6	48.80
.093 (3/32)	.0930		.670 (7x)	7	1/8	2-1/2	881393-C6	48.80
.093 (3/32)	.0930		.750 (8x)	7	1/8	2-1/2	59093-C6	49.60
.093 (3/32)	.0930		.950 (10x)	7	1/8	2-1/2	941893-C6	62.70
.093 (3/32)	.0930		1.125 (12x)	7	1/8	2-1/2	69193-C6	70.40
.093 (3/32)	.0930		1.400 (15x)	7	1/8	3	68793-C6	89.00
2.5 mm	.0984		7.50 mm (3x)	7	4 mm	50 mm	967651-C6	42.20
.100	.1000		.150 (1.5x)	7	1/8	1-1/2	960100-C6	34.60
.100	.1000		.300 (3x)	7	1/8	1-1/2	57900-C6	34.40
.100	.1000		.500 (5x)	7	1/8	2-1/2	62700-C6	48.10
.100	.1000		.800 (8x)	7	1/8	2-1/2	59100-C6	49.60
.109 (7/64)	.1090		.327 (3x)	7	1/8	1-1/2	57902-C6	34.40
.109 (7/64)	.1090		.570 (5x)	7	1/8	2-1/2	62702-C6	48.10
.109 (7/64)	.1090		.900 (8x)	7	1/8	2-1/2	59102-C6	51.60
3.0 mm	.1181		4.50 mm (1.5x)	7	4 mm	50 mm	846757-C6	42.20
3.0 mm	.1181		9.00 mm (3x)	7	4 mm	50 mm	967657-C6	42.20
3.0 mm	.1181		12.00 mm (4x)	7	4 mm	50 mm	773057-C6	42.20
3.0 mm	.1181		15.00 mm (5x)	7	4 mm	50 mm	974557-C6	43.60
3.0 mm	.1181		24.00 mm (8x)	7	4 mm	50 mm	976157-C6	47.30

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)



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HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" - .002"	+ .00 mm - .04 mm	decimal equivalent	+ .030" - .000" + .75 mm - .00 mm					
.125 (1/8)		.1250	.100 (0.8x)	7	1/8	1-1/2	836608-C6	36.10
.125 (1/8)		.1250	.187 (1.5x)	7	1/8	1-1/2	960108-C6	33.00
.125 (1/8)		.1250	.375 (3x)	7	1/8	1-1/2	57908-C6	32.40
.125 (1/8)		.1250	.500 (4x)	7	1/8	2-1/2	890208-C6	47.30
.125 (1/8)		.1250	.625 (5x)	7	1/8	2-1/2	62708-C6	47.30
.125 (1/8)		.1250	.750 (6x)	7	1/8	2-1/2	868608-C6	48.00
.125 (1/8)		.1250	.875 (7x)	7	1/8	2-1/2	881408-C6	48.00
.125 (1/8)		.1250	1.000 (8x)	7	1/8	2-1/2	59108-C6	48.80
.125 (1/8)		.1250	1.250 (10x)	7	1/8	2-1/2	941908-C6	62.00
.125 (1/8)		.1250	1.500 (12x)	7	1/8	3	69208-C6	69.90
.125 (1/8)		.1250	1.875 (15x)	7	1/8	3	68808-C6	90.30
.140 (9/64)		.1406	.425 (3x)	7	3/16	2	57909-C6	45.30
.140 (9/64)		.1406	.750 (5x)	7	3/16	3	62709-C6	47.30
.140 (9/64)		.1406	1.125 (8x)	7	3/16	3	59109-C6	50.40
.156 (5/32)		.1562	.235 (1.5x)	7	3/16	2	960110-C6	37.40
.156 (5/32)		.1562	.470 (3x)	7	3/16	2	57910-C6	36.90
.156 (5/32)		.1562	.625 (4x)	7	3/16	3	890210-C6	36.90
.156 (5/32)		.1562	.750 (5x)	7	3/16	3	62710-C6	49.80
.156 (5/32)		.1562	1.250 (8x)	7	3/16	3	59110-C6	53.40
.187 (3/16)		.1875	.150 (0.8x)	7	3/16	2	836612-C6	40.50
.187 (3/16)		.1875	.285 (1.5x)	7	3/16	2	960112-C6	37.40
.187 (3/16)		.1875	.570 (3x)	7	3/16	2	57912-C6	36.90
.187 (3/16)		.1875	.750 (4x)	7	3/16	3	890212-C6	49.80
.187 (3/16)		.1875	1.000 (5x)	7	3/16	3	62712-C6	49.80
.187 (3/16)		.1875	1.156 (6x)	7	3/16	3	868612-C6	52.70
.187 (3/16)		.1875	1.312 (7x)	7	3/16	3	881412-C6	52.70
.187 (3/16)		.1875	1.500 (8x)	7	3/16	3	59112-C6	53.60
5.0 mm		.1968	25.00 mm (5x)	7	6 mm	63 mm	974564-C6	50.40
.218 (7/32)		.2187	.660 (3x)	7	1/4	2-1/2	57814-C6	49.00
.218 (7/32)		.2187	1.125 (5x)	7	1/4	4	62714-C6	62.10
6.0 mm		.2362	18.00 mm (3x)	7	6 mm	63 mm	967666-C6	47.50
6.0 mm		.2362	30.00 mm (5x)	7	6 mm	63 mm	974566-C6	50.40
.250 (1/4)		.2500	.200 (0.8x)	7	1/4	2-1/2	836616-C6	51.80
.250 (1/4)		.2500	.375 (1.5x)	7	1/4	2-1/2	960116-C6	48.70
.250 (1/4)		.2500	.750 (3x)	7	1/4	2-1/2	57916-C6	47.90
.250 (1/4)		.2500	1.000 (4x)	7	1/4	4	890216-C6	61.10
.250 (1/4)		.2500	1.250 (5x)	7	1/4	4	62716-C6	61.10
.250 (1/4)		.2500	1.500 (6x)	7	1/4	4	868616-C6	64.50
.250 (1/4)		.2500	1.750 (7x)	7	1/4	4	881416-C6	64.50
.250 (1/4)		.2500	2.000 (8x)	7	1/4	4	59116-C6	65.20
.312 (5/16)		.3125	.470 (1.5x)	7	5/16	2-1/2	960120-C6	65.80
.312 (5/16)		.3125	1.000 (3x)	7	5/16	2-1/2	57920-C6	64.90
.375 (3/8)		.3750	.570 (1.5x)	7	3/8	2-1/2	960124-C6	74.70
.375 (3/8)		.3750	1.125 (3x)	7	3/8	2-1/2	57924-C6	74.10
.375 (3/8)		.3750	2.000 (5x)	7	3/8	4	62724-C6	94.00
.500 (1/2)		.5000	.750 (1.5x)	7	1/2	3	960132-C6	96.00
.500 (1/2)		.5000	1.500 (3x)	7	1/2	3	57932-C6	96.00

NEW

see Speeds & Feeds on next page

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)

SPEEDS & FEEDS (Finishers for High Temp Alloys)														
Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter									Depth of Cut		
			.015	.031	.047	.062	.078	.093	.125	.187	.250	Radial	Axial	
Stainless Steels: 40x, 41x, 42x, 43x, 44x, 13-8, 15-5, 15-7, 17-4, 17-7	275 - 300 300 - 350	400 350	Finishing (0.8x LOC)	.00013	.00026	.00040	.00053	.00066	.00079	.00106	.00158	.00212	< .10x Dia	5x - 1.5x Dia
			Finishing (1.5x LOC)	.00012	.00024	.00036	.00048	.00060	.00072	.00096	.00144	.00193	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00011	.00022	.00033	.00043	.00055	.00065	.00088	.00131	.00175	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00010	.00021	.00031	.00042	.00052	.00062	.00084	.00125	.00167	< .10x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00008	.00016	.00025	.00033	.00041	.00049	.00066	.00098	.00131	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00007	.00015	.00022	.00030	.00037	.00044	.00060	.00089	.00119	< .07x Dia	5x - 6x Dia
			Finishing (7x LOC)	.00006	.00013	.00020	.00026	.00032	.00039	.00052	.00078	.00104	< .05x Dia	5x - 7x Dia
			Finishing (8x LOC)	.00006	.00012	.00018	.00024	.00030	.00036	.00048	.00072	.00096	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00011	.00017	.00023	.00028	.00034	.00046	.00068	.00091	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00011	.00016	.00022	.00027	.00033	.00044	.00065	.00088	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00020	.00025	.00029	.00039	.00059	.00079	< .02x Dia	5x - 15x Dia
Tool Steels: D, H, M, T, S series	300 - 350	500	Finishing (0.8x LOC)	.00013	.00026	.00040	.00053	.00066	.00079	.00106	.00158	.00212	< .10x Dia	5x - 1.5x Dia
			Finishing (1.5x LOC)	.00012	.00024	.00036	.00048	.00060	.00072	.00096	.00144	.00193	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00011	.00022	.00033	.00043	.00055	.00065	.00088	.00131	.00175	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00010	.00021	.00031	.00042	.00052	.00062	.00084	.00125	.00167	< .10x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00008	.00016	.00025	.00033	.00041	.00049	.00066	.00098	.00131	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00007	.00015	.00022	.00030	.00037	.00044	.00060	.00089	.00119	< .07x Dia	5x - 6x Dia
			Finishing (7x LOC)	.00006	.00013	.00020	.00026	.00032	.00039	.00052	.00078	.00104	< .05x Dia	5x - 7x Dia
			Finishing (8x LOC)	.00006	.00012	.00018	.00024	.00030	.00036	.00048	.00072	.00096	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00011	.00017	.00023	.00028	.00034	.00046	.00068	.00091	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00011	.00016	.00022	.00027	.00033	.00044	.00065	.00088	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00020	.00025	.00029	.00039	.00059	.00079	< .02x Dia	5x - 15x Dia
	350 - 400	250	Finishing (0.8x LOC)	.00010	.00021	.00032	.00042	.00053	.00063	.00085	.00127	.00169	< .10x Dia	5x - 1.5x Dia
			Finishing (1.5x LOC)	.00009	.00019	.00029	.00038	.00048	.00057	.00077	.00115	.00154	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00008	.00017	.00026	.00035	.00044	.00052	.00070	.00105	.00140	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00008	.00017	.00025	.00033	.00042	.00050	.00067	.00100	.00134	< .10x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00006	.00013	.00020	.00026	.00033	.00039	.00053	.00079	.00105	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00006	.00012	.00018	.00024	.00030	.00035	.00048	.00071	.00095	< .07x Dia	5x - 6x Dia
			Finishing (7x LOC)	.00005	.00010	.00016	.00021	.00026	.00031	.00042	.00062	.00083	< .05x Dia	5x - 7x Dia
			Finishing (8x LOC)	.00005	.00010	.00014	.00019	.00024	.00029	.00039	.00058	.00077	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00009	.00014	.00018	.00023	.00027	.00036	.00054	.00073	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00009	.00013	.00017	.00022	.00026	.00035	.00052	.00070	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00016	.00020	.00023	.00032	.00047	.00063	< .02x Dia	5x - 15x Dia
	400 - 540	200	Finishing (0.8x LOC)	.00008	.00017	.00026	.00034	.00043	.00051	.00069	.00103	.00138	< .10x Dia	5x - 1.5x Dia
			Finishing (1.5x LOC)	.00008	.00016	.00024	.00031	.00039	.00047	.00063	.00094	.00125	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00007	.00014	.00021	.00028	.00035	.00042	.00057	.00085	.00114	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00007	.00013	.00020	.00027	.00034	.00040	.00054	.00081	.00109	< .10x Dia	5x - 5x Dia
			Finishing (5x LOC)	.00005	.00011	.00016	.00021	.00027	.00032	.00043	.00064	.00085	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00005	.00010	.00015	.00019	.00024	.00029	.00039	.00058	.00077	< .07x Dia	5x - 6x Dia
			Finishing (7x LOC)	.00004	.00008	.00013	.00017	.00021	.00025	.00034	.00050	.00067	< .05x Dia	5x - 7x Dia
			Finishing (8x LOC)	.00004	.00008	.00012	.00016	.00020	.00023	.00031	.00047	.00063	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00007	.00011	.00015	.00018	.00022	.00030	.00044	.00059	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00007	.00011	.00014	.00018	.00021	.00028	.00043	.00057	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00013	.00016	.00019	.00026	.00038	.00051	< .02x Dia	5x - 15x Dia

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square (cont.)

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SPEEDS & FEEDS (Finishers for High Temp Alloys)														
Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter								Depth of Cut			
			.015	.031	.047	.062	.078	.093	.125	.187	.250	Radial	Axial	
Titanium: All alloys	275 - 300 300 - 350	300 200	Finishing (0.8x LOC)	.00006	.00012	.00018	.00023	.00029	.00035	.00047	.00070	.00094	< .10x Dia	.5x - 1.5x Dia
			Finishing (1.5x LOC)	.00005	.00011	.00016	.00021	.00027	.00032	.00043	.00064	.00085	< .10x Dia	.5x - 1.5x Dia
			Finishing (3x LOC)	.00005	.00010	.00015	.00019	.00024	.00029	.00039	.00058	.00078	< .10x Dia	.5x - 3x Dia
			Finishing (4x LOC)	.00004	.00009	.00014	.00018	.00023	.00028	.00037	.00055	.00074	< .10x Dia	.5x - 4x Dia
			Finishing (5x LOC)	.00003	.00007	.00011	.00014	.00018	.00022	.00029	.00043	.00058	< .07x Dia	.5x - 5x Dia
			Finishing (6x LOC)	.00003	.00007	.00010	.00013	.00016	.00020	.00026	.00039	.00053	< .07x Dia	.5x - 6x Dia
			Finishing (7x LOC)	.00003	.00006	.00009	.00011	.00014	.00017	.00023	.00034	.00046	< .05x Dia	.5x - 7x Dia
			Finishing (8x LOC)	.00003	.00005	.00008	.00011	.00013	.00016	.00021	.00032	.00043	< .05x Dia	.5x - 8x Dia
			Finishing (10x LOC)	-	.00005	.00008	.00010	.00013	.00015	.00020	.00030	.00040	< .04x Dia	.5x - 10x Dia
			Finishing (12x LOC)	-	.00005	.00007	.00010	.00012	.00014	.00019	.00029	.00039	< .04x Dia	.5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00009	.00011	.00013	.00017	.00026	.00035	< .02x Dia	.5x - 15x Dia
	350 - 400 400 - 425	150 100	Finishing (0.8x LOC)	.00005	.00009	.00014	.00019	.00023	.00028	.00038	.00056	.00075	< .10x Dia	.5x - 1.5x Dia
			Finishing (1.5x LOC)	.00004	.00008	.00013	.00017	.00021	.00025	.00034	.00051	.00068	< .10x Dia	.5x - 1.5x Dia
			Finishing (3x LOC)	.00004	.00008	.00012	.00015	.00019	.00023	.00031	.00046	.00062	< .10x Dia	.5x - 3x Dia
			Finishing (4x LOC)	.00004	.00007	.00011	.00015	.00019	.00022	.00030	.00044	.00059	< .10x Dia	.5x - 4x Dia
			Finishing (5x LOC)	.00003	.00006	.00009	.00012	.00015	.00017	.00023	.00035	.00047	< .07x Dia	.5x - 5x Dia
			Finishing (6x LOC)	.00003	.00005	.00008	.00010	.00013	.00016	.00021	.00032	.00042	< .07x Dia	.5x - 6x Dia
			Finishing (7x LOC)	.00002	.00005	.00007	.00009	.00011	.00014	.00018	.00028	.00037	< .05x Dia	.5x - 7x Dia
			Finishing (8x LOC)	.00002	.00004	.00006	.00008	.00011	.00013	.00017	.00026	.00034	< .05x Dia	.5x - 8x Dia
			Finishing (10x LOC)	-	.00004	.00006	.00008	.00010	.00012	.00016	.00024	.00032	< .04x Dia	.5x - 10x Dia
			Finishing (12x LOC)	-	.00004	.00006	.00008	.00010	.00012	.00016	.00023	.00031	< .04x Dia	.5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00007	.00009	.00010	.00014	.00021	.00028	< .02x Dia	.5x - 15x Dia
Nickel Alloys: Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	275 - 300 300 - 350	150 100	Finishing (0.8x LOC)	.00002	.00005	.00007	.00010	.00012	.00015	.00020	.00029	.00039	< .10x Dia	.5x - 1.5x Dia
			Finishing (1.5x LOC)	.00002	.00004	.00007	.00009	.00011	.00013	.00018	.00027	.00036	< .10x Dia	.5x - 1.5x Dia
			Finishing (3x LOC)	.00002	.00004	.00006	.00008	.00010	.00012	.00016	.00024	.00033	< .10x Dia	.5x - 3x Dia
			Finishing (4x LOC)	.00002	.00004	.00005	.00007	.00009	.00011	.00014	.00021	.00029	< .10x Dia	.5x - 4x Dia
			Finishing (5x LOC)	.00001	.00002	.00004	.00005	.00006	.00007	.00010	.00015	.00020	< .05x Dia	.5x - 5x Dia
			Finishing (6x LOC)	.00001	.00002	.00003	.00005	.00006	.00007	.00009	.00014	.00018	< .05x Dia	.5x - 6x Dia
			Finishing (7x LOC)	.00001	.00002	.00003	.00004	.00005	.00006	.00007	.00011	.00015	< .03x Dia	.5x - 7x Dia
			Finishing (8x LOC)	.00001	.00002	.00003	.00004	.00005	.00006	.00008	.00011	.00015	< .03x Dia	.5x - 8x Dia
			Finishing (10x LOC)	-	.00002	.00003	.00003	.00004	.00005	.00007	.00010	.00014	< .02x Dia	.5x - 10x Dia
			Finishing (12x LOC)	-	.00002	.00002	.00003	.00004	.00005	.00007	.00010	.00013	< .02x Dia	.5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00003	.00004	.00004	.00006	.00009	.00011	< .01x Dia	.5x - 15x Dia
	350 - 400 400 - 425	80 60	Finishing (0.8x LOC)	.00002	.00004	.00006	.00008	.00010	.00012	.00016	.00024	.00031	< .10x Dia	.5x - 1.5x Dia
			Finishing (1.5x LOC)	.00002	.00004	.00005	.00007	.00009	.00011	.00014	.00021	.00029	< .10x Dia	.5x - 1.5x Dia
			Finishing (3x LOC)	.00002	.00003	.00005	.00006	.00008	.00010	.00013	.00019	.00026	< .10x Dia	.5x - 3x Dia
			Finishing (4x LOC)	.00001	.00003	.00004	.00006	.00007	.00009	.00011	.00017	.00023	< .10x Dia	.5x - 4x Dia
			Finishing (5x LOC)	.00001	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	< .05x Dia	.5x - 5x Dia
			Finishing (6x LOC)	.00001	.00002	.00003	.00004	.00005	.00005	.00007	.00011	.00015	< .05x Dia	.5x - 6x Dia
			Finishing (7x LOC)	.00001	.00001	.00002	.00003	.00004	.00004	.00006	.00009	.00012	< .03x Dia	.5x - 7x Dia
			Finishing (8x LOC)	.00001	.00002	.00002	.00003	.00004	.00005	.00006	.00009	.00012	< .03x Dia	.5x - 8x Dia
			Finishing (10x LOC)	-	.00001	.00002	.00003	.00003	.00004	.00006	.00008	.00011	< .02x Dia	.5x - 10x Dia
			Finishing (12x LOC)	-	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00010	< .02x Dia	.5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00002	.00003	.00003	.00005	.00007	.00009	< .01x Dia	.5x - 15x Dia

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square – Long Reach



- Optimized for titanium alloys, inconel, nickel alloys, and other high-temperature materials with outstanding performance in difficult-to-machine steels, stainless steels, and tool steels
- Long reach design for deep cavities and increased rigidity
- Length of cut = 3x diameter
- Variable helix design (approx. 41°) reduces chatter and harmonics improving finish
- Large core and eccentric relief for improved tool life
- Latest generation AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- End cutting (not center cutting)
- Solid carbide
- CNC ground in the USA

HIGH TEMP ALLOYS

mm & in

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
D ₁								TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	L ₂ + .010" / - .000" / + .25mm / - .00mm	L ₃ + .010" / - .000" / + .25mm / - .00mm		D ₂ (h6)	L ₁		
.015 (1/64)	.0150	.0150	.045	.078 (5x)	4	1/8	2-1/2	940715-C6	59.20
.015 (1/64)	.0150	.0150	.045	.125 (8x)	4	1/8	2-1/2	962115-C6	61.20
.015 (1/64)	.0150	.0150	.045	.187 (12x)	4	1/8	2-1/2	951815-C6	64.50
.020	.0200	.0200	.060	.160 (8x)	4	1/8	2-1/2	962120-C6	53.50
.025	.0250	.0250	.075	.203 (8x)	4	1/8	2-1/2	962125-C6	53.50
.031 (1/32)	.0310	.0310	.093	.156 (5x)	6	1/8	2-1/2	940731-C6	52.10
.031 (1/32)	.0310	.0310	.093	.187 (6x)	6	1/8	2-1/2	792531-C6	52.10
.031 (1/32)	.0310	.0310	.093	.250 (8x)	6	1/8	2-1/2	962131-C6	53.50
.031 (1/32)	.0310	.0310	.093	.312 (10x)	6	1/8	2-1/2	862831-C6	55.30
.031 (1/32)	.0310	.0310	.093	.375 (12x)	6	1/8	2-1/2	951831-C6	56.90
1.0 mm	.0393	.0393	3.00 mm	8.0 mm (8x)	6	4 mm	50 mm	924722-C6	54.00
.040	.0400	.0400	.120	.325 (8x)	6	1/8	2-1/2	962140-C6	53.50
.047 (3/64)	.0470	.0470	.141	.250 (5x)	6	1/8	2-1/2	940747-C6	52.10
.047 (3/64)	.0470	.0470	.141	.375 (8x)	6	1/8	2-1/2	962147-C6	53.50
.047 (3/64)	.0470	.0470	.141	.570 (12x)	6	1/8	2-1/2	951847-C6	56.90
.050	.0500	.0500	.150	.250 (5x)	7	1/8	2-1/2	940750-C6	52.10
.050	.0500	.0500	.150	.400 (8x)	7	1/8	2-1/2	962150-C6	53.50
1.5 mm	.0590	.0590	4.50 mm	12.0 mm (8x)	7	4 mm	50 mm	924733-C6	54.00
.060	.0600	.0600	.180	.500 (8x)	7	1/8	2-1/2	962160-C6	53.50
.062 (1/16)	.0620	.0620	.186	.312 (5x)	7	1/8	2-1/2	940762-C6	49.80
.062 (1/16)	.0620	.0620	.186	.375 (6x)	7	1/8	2-1/2	792562-C6	49.80
.062 (1/16)	.0620	.0620	.186	.500 (8x)	7	1/8	2-1/2	962162-C6	51.30
.062 (1/16)	.0620	.0620	.186	.625 (10x)	7	1/8	2-1/2	862862-C6	53.10
.062 (1/16)	.0620	.0620	.186	.750 (12x)	7	1/8	2-1/2	951862-C6	54.80
.070	.0700	.0700	.210	.570 (8x)	7	1/8	2-1/2	962170-C6	51.30
.078 (5/64)	.0780	.0780	.234	.406 (5x)	7	1/8	2-1/2	940778-C6	49.80
.078 (5/64)	.0780	.0780	.234	.625 (8x)	7	1/8	2-1/2	962178-C6	51.30
.078 (5/64)	.0780	.0780	.234	.940 (12x)	7	1/8	2-1/2	951878-C6	54.80
2.0 mm	.0787	.0787	6.00 mm	16.0 mm (8x)	7	4 mm	50 mm	924745-C6	51.80

continued on next page

VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

Finishers – Square – Long Reach (cont.)



continued from previous page

HIGH TEMP ALLOYS

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm	L ₃ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.080		.0800	.240	.650 (8x)	7	1/8	2-1/2	962180-C6	51.30
.090		.0900	.270	.750 (8x)	7	1/8	2-1/2	962190-C6	51.30
.093 (3/32)		.0930	.279	.500 (5x)	7	1/8	2-1/2	940793-C6	49.80
.093 (3/32)		.0930	.279	.585 (6x)	7	1/8	2-1/2	792593-C6	49.80
.093 (3/32)		.0930	.279	.750 (8x)	7	1/8	2-1/2	962193-C6	51.30
.093 (3/32)		.0930	.279	.950 (10x)	7	1/8	2-1/2	862893-C6	53.10
.093 (3/32)		.0930	.279	1.125 (12x)	7	1/8	2-1/2	951893-C6	54.80
.100		.1000	.300	.800 (8x)	7	1/8	2-1/2	962200-C6	51.30
.109 (7/64)		.1094	.327	.570 (5x)	7	1/8	2-1/2	940802-C6	49.80
.109 (7/64)		.1094	.327	.900 (8x)	7	1/8	2-1/2	962202-C6	51.30
3.0 mm		.1181	9.00 mm	24.0 mm (8x)	7	4 mm	50 mm	924757-C6	51.80

D ₁ +.000" -.002"		L ₂ +.030" -.000"	L ₃ +.030" -.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)	.1250	.375	.625 (5x)	7	1/8	2-1/2	940808-C6	48.10
.125 (1/8)	.1250	.375	.750 (6x)	7	1/8	2-1/2	792608-C6	48.10
.125 (1/8)	.1250	.375	1.000 (8x)	7	1/8	2-1/2	962208-C6	49.50
.125 (1/8)	.1250	.375	1.250 (10x)	7	1/8	3	862908-C6	51.10
.125 (1/8)	.1250	.375	1.500 (12x)	7	1/8	3	951908-C6	52.70
.140 (9/64)	.1406	.425	.703 (5x)	7	3/16	3	940809-C6	51.30
.140 (9/64)	.1406	.425	1.125 (8x)	7	3/16	3	962209-C6	52.70
.156 (5/32)	.1562	.470	.750 (5x)	7	3/16	3	940810-C6	48.10
.156 (5/32)	.1562	.470	1.250 (8x)	7	3/16	3	962210-C6	49.50
.187 (3/16)	.1875	.570	1.000 (5x)	7	3/16	3	940812-C6	51.00
.187 (3/16)	.1875	.570	1.500 (8x)	7	3/16	3	962212-C6	52.30
.250 (1/4)	.2500	.750	1.250 (5x)	7	1/4	4	940816-C6	61.60
.250 (1/4)	.2500	.750	2.000 (8x)	7	1/4	4	962216-C6	63.60

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VARIABLE HELIX END MILLS FOR HIGH TEMP ALLOYS

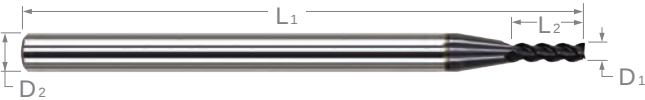
Finishers – Square – Long Reach (cont.)

HIGH TEMP ALLOYS

SPEEDS & FEEDS (Finishers – Long Reach for High Temp Alloys)														
Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter									Depth of Cut		
				.015	.031	.047	.062	.078	.093	.125	.187	.250	Radial	Axial
Stainless Steels: 40x, 41x, 42x, 43x, 44x, 13-8, 15-5, 15-7, 17-4, 17-7	275 - 300 300 - 350	400 350	Finishing (5x Reach)	.00009	.00020	.00030	.00039	.00049	.00059	.00079	.00118	.00158	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00009	.00018	.00028	.00037	.00046	.00055	.00074	.00111	.00148	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00008	.00016	.00025	.00032	.00041	.00049	.00065	.00098	.00131	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00007	.00015	.00023	.00031	.00039	.00046	.00062	.00093	.00124	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00007	.00015	.00022	.00029	.00037	.00044	.00059	.00088	.00118	< .05x Dia	.5x - 3x Dia
Tool Steels: D, H, M, T, S series	300 - 350	500	Finishing (5x Reach)	.00009	.00020	.00030	.00039	.00049	.00059	.00079	.00118	.00158	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00009	.00018	.00028	.00037	.00046	.00055	.00074	.00111	.00148	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00008	.00016	.00025	.00032	.00041	.00049	.00065	.00098	.00131	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00007	.00015	.00023	.00031	.00039	.00046	.00062	.00093	.00124	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00007	.00015	.00022	.00029	.00037	.00044	.00059	.00088	.00118	< .05x Dia	.5x - 3x Dia
	350 - 400	250	Finishing (5x Reach)	.00008	.00016	.00024	.00031	.00039	.00047	.00063	.00094	.00126	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00007	.00015	.00022	.00029	.00037	.00044	.00059	.00089	.00118	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00006	.00013	.00020	.00026	.00033	.00039	.00052	.00078	.00105	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00006	.00012	.00019	.00025	.00031	.00037	.00050	.00074	.00100	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00006	.00012	.00018	.00023	.00029	.00035	.00047	.00071	.00095	< .05x Dia	.5x - 3x Dia
	400 - 540	200	Finishing (5x Reach)	.00006	.00013	.00019	.00025	.00032	.00038	.00051	.00077	.00102	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00006	.00012	.00018	.00024	.00030	.00036	.00048	.00072	.00096	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00005	.00011	.00016	.00021	.00027	.00032	.00042	.00064	.00085	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00005	.00010	.00015	.00020	.00025	.00030	.00040	.00060	.00081	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00005	.00010	.00014	.00019	.00024	.00029	.00038	.00057	.00077	< .05x Dia	.5x - 3x Dia
Titanium: All alloys	275 - 300 300 - 350	300 200	Finishing (5x Reach)	.00004	.00009	.00013	.00017	.00022	.00026	.00035	.00052	.00070	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00004	.00008	.00012	.00016	.00020	.00024	.00033	.00049	.00066	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00003	.00007	.00011	.00014	.00018	.00022	.00029	.00043	.00058	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00003	.00007	.00010	.00014	.00017	.00020	.00028	.00041	.00055	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00003	.00006	.00010	.00013	.00016	.00019	.00026	.00039	.00052	< .05x Dia	.5x - 3x Dia
	350 - 400 400 - 425	150 100	Finishing (5x Reach)	.00003	.00007	.00010	.00014	.00017	.00021	.00028	.00042	.00056	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00003	.00007	.00010	.00013	.00016	.00020	.00026	.00039	.00052	< .07x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00003	.00006	.00009	.00011	.00014	.00017	.00023	.00035	.00046	< .07x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00003	.00005	.00008	.00011	.00014	.00016	.00022	.00033	.00044	< .05x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00003	.00005	.00008	.00010	.00013	.00016	.00021	.00031	.00042	< .05x Dia	.5x - 3x Dia
Nickel Alloys: Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	275 - 300 300 - 350	150 100	Finishing (5x Reach)	.00002	.00004	.00005	.00007	.00009	.00011	.00015	.00022	.00029	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00001	.00002	.00004	.00005	.00006	.00007	.00010	.00014	.00019	< .05x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00001	.00002	.00003	.00004	.00005	.00007	.00009	.00013	.00018	< .05x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00001	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00016	< .03x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00001	.00002	.00003	.00003	.00004	.00005	.00007	.00010	.00014	< .03x Dia	.5x - 3x Dia
	350 - 400 400 - 425	80 60	Finishing (5x Reach)	.00001	.00003	.00004	.00006	.00007	.00009	.00012	.00018	.00023	< .10x Dia	.5x - 3x Dia
			Finishing (6x Reach)	.00001	.00002	.00003	.00004	.00005	.00006	.00008	.00012	.00015	< .05x Dia	.5x - 3x Dia
			Finishing (8x Reach)	.00001	.00002	.00003	.00003	.00004	.00005	.00007	.00011	.00014	< .05x Dia	.5x - 3x Dia
			Finishing (10x Reach)	.00001	.00002	.00002	.00003	.00004	.00005	.00006	.00010	.00013	< .03x Dia	.5x - 3x Dia
			Finishing (12x Reach)	.00001	.00001	.00002	.00003	.00003	.00004	.00005	.00008	.00011	< .03x Dia	.5x - 3x Dia

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Square



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

MEDIUM ALLOY STEELS

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005"	+ .00mm	decimal	+ .010"					
- .0005"	- .02mm	equivalent	- .000"					
			+ .25mm					
			- .00mm					
.010		.0100	.015 (1.5x)	3	1/8	1-1/2	964910-C3	53.70
.010		.0100	.030 (3x)	3	1/8	1-1/2	958510-C3	53.70
.015 (1/64)		.0150	.023 (1.5x)	3	1/8	1-1/2	964915-C3	43.70
.015 (1/64)		.0150	.045 (3x)	3	1/8	1-1/2	958515-C3	43.70
.015 (1/64)		.0150	.078 (5x)	3	1/8	2-1/2	952615-C3	53.70
.5 mm		.0196	1.50 mm (3x)	3	4 mm	50 mm	945911-C3	42.10
.020		.0200	.030 (1.5x)	3	1/8	1-1/2	964920-C3	38.40
.020		.0200	.060 (3x)	3	1/8	1-1/2	958520-C3	38.40
.020		.0200	.100 (5x)	3	1/8	2-1/2	952620-C3	47.30
.025		.0250	.038 (1.5x)	3	1/8	1-1/2	964925-C3	36.90
.025		.0250	.075 (3x)	3	1/8	1-1/2	958525-C3	36.90
.025		.0250	.125 (5x)	3	1/8	2-1/2	952625-C3	45.80
.030		.0300	.090 (3x)	3	1/8	1-1/2	958530-C3	36.70
.031 (1/32)		.0310	.047 (1.5x)	3	1/8	1-1/2	964931-C3	31.10
.031 (1/32)		.0310	.093 (3x)	3	1/8	1-1/2	958531-C3	31.10
.031 (1/32)		.0310	.125 (4x)	3	1/8	2-1/2	814831-C3	40.10
.031 (1/32)		.0310	.156 (5x)	3	1/8	2-1/2	952631-C3	40.10
.035		.0350	.053 (1.5x)	3	1/8	1-1/2	964935-C3	31.10
.035		.0350	.105 (3x)	3	1/8	1-1/2	958535-C3	31.10
1.0 mm		.0393	3.00 mm (3x)	3	4 mm	50 mm	945922-C3	34.90
.040		.0400	.060 (1.5x)	3	1/8	1-1/2	964940-C3	31.30
.040		.0400	.120 (3x)	3	1/8	1-1/2	958540-C3	31.30
.040		.0400	.203 (5x)	3	1/8	2-1/2	952640-C3	40.30
.045		.0450	.068 (1.5x)	3	1/8	1-1/2	964945-C3	31.30
.045		.0450	.135 (3x)	3	1/8	1-1/2	958545-C3	31.30
.045		.0450	.225 (5x)	3	1/8	2-1/2	952645-C3	40.30
.047 (3/64)		.0470	.071 (1.5x)	3	1/8	1-1/2	964947-C3	31.10
.047 (3/64)		.0470	.141 (3x)	3	1/8	1-1/2	958547-C3	31.10
.047 (3/64)		.0470	.250 (5x)	3	1/8	2-1/2	952647-C3	40.10
.050		.0500	.075 (1.5x)	3	1/8	1-1/2	964950-C3	31.30
.050		.0500	.150 (3x)	3	1/8	1-1/2	958550-C3	31.30
.055		.0550	.083 (1.5x)	3	1/8	1-1/2	964955-C3	31.10
.055		.0550	.165 (3x)	3	1/8	1-1/2	958555-C3	31.10
.055		.0550	.275 (5x)	3	1/8	2-1/2	952655-C3	40.10
1.5 mm		.0590	4.50 mm (3x)	3	4 mm	50 mm	945933-C3	33.00
.060		.0600	.180 (3x)	3	1/8	1-1/2	958560-C3	32.30
.062 (1/16)		.0620	.050 (0.8x)	3	1/8	1-1/2	835762-C3	32.20
.062 (1/16)		.0620	.093 (1.5x)	3	1/8	1-1/2	964962-C3	29.10

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Square (cont.)



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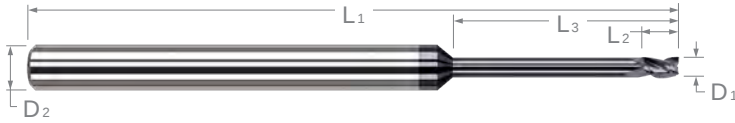
CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AISI COATED	
D ₁ +.0005" - .0005" +.00 mm - .02 mm decimal equivalent	D ₂ (h6)	L ₁	L ₂ +.010" - .000" +.25 mm - .00 mm				TOOL #	PRICE
.062 (1/16)		.0620	.186 (3x)	3	1/8	1-1/2	958562-C3	29.10
.062 (1/16)		.0620	.250 (4x)	3	1/8	2-1/2	814862-C3	33.70
.062 (1/16)		.0620	.312 (5x)	3	1/8	2-1/2	952662-C3	38.30
.070		.0700	.105 (1.5x)	3	1/8	1-1/2	964970-C3	29.10
.070		.0700	.210 (3x)	3	1/8	1-1/2	958570-C3	29.10
.078 (5/64)		.0780	.118 (1.5x)	3	1/8	1-1/2	964978-C3	29.10
.078 (5/64)		.0780	.234 (3x)	3	1/8	1-1/2	958578-C3	29.10
.078 (5/64)		.0780	.406 (5x)	3	1/8	2-1/2	952678-C3	38.30
2.0 mm		.0787	6.00 mm (3x)	3	4 mm	50 mm	945945-C3	33.00
.080		.0800	.240 (3x)	3	1/8	1-1/2	958580-C3	29.10
.090		.0900	.270 (3x)	3	1/8	1-1/2	958590-C3	29.10
.093 (3/32)		.0930	.074 (0.8x)	3	1/8	1-1/2	835793-C3	32.20
.093 (3/32)		.0930	.140 (1.5x)	3	1/8	1-1/2	964993-C3	29.10
.093 (3/32)		.0930	.279 (3x)	3	1/8	1-1/2	958593-C3	29.10
.093 (3/32)		.0930	.375 (4x)	3	1/8	2-1/2	814893-C3	33.70
.093 (3/32)		.0930	.500 (5x)	3	1/8	2-1/2	952693-C3	38.30
.100		.1000	.150 (1.5x)	3	1/8	1-1/2	965000-C3	29.10
.100		.1000	.300 (3x)	3	1/8	1-1/2	958600-C3	29.10
.109 (7/64)		.1090	.164 (1.5x)	3	1/8	1-1/2	965002-C3	29.10
.109 (7/64)		.1090	.327 (3x)	3	1/8	1-1/2	958602-C3	29.10
3.0 mm		.1181	9.00 mm (3x)	3	4 mm	50 mm	945957-C3	33.00

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AISI COATED	
D ₁ +.000" - .002" +.00 mm - .04 mm decimal equivalent	D ₂ (h6)	L ₁	L ₂ +.030" - .000" +.75 mm - .00 mm				TOOL #	PRICE
.125 (1/8)		.1250	.100 (0.8x)	4	1/8	1-1/2	835808-C3	30.60
.125 (1/8)		.1250	.187 (1.5x)	4	1/8	1-1/2	965008-C3	27.60
.125 (1/8)		.1250	.375 (3x)	4	1/8	1-1/2	958608-C3	27.60
.125 (1/8)		.1250	.500 (4x)	4	1/8	2-1/2	814908-C3	35.10
.125 (1/8)		.1250	.625 (5x)	4	1/8	2-1/2	952708-C3	38.10
.140 (9/64)		.1406	.220 (1.5x)	4	3/16	2	965009-C3	39.70
.140 (9/64)		.1406	.425 (3x)	4	3/16	2	958609-C3	39.70
.156 (5/32)		.1562	.235 (1.5x)	4	3/16	2	965010-C3	29.80
.156 (5/32)		.1562	.470 (3x)	4	3/16	2	958610-C3	29.80
.156 (5/32)		.1562	.750 (5x)	4	3/16	3	952710-C3	40.70
.187 (3/16)		.1875	.150 (0.8x)	4	3/16	2	835812-C3	32.70
.187 (3/16)		.1875	.285 (1.5x)	4	3/16	2	965012-C3	29.80
.187 (3/16)		.1875	.562 (3x)	4	3/16	2	958612-C3	29.80
.187 (3/16)		.1875	1.000 (5x)	4	3/16	3	952712-C3	40.70
6.0 mm		.2362	18.00 mm (3x)	4	6 mm	63 mm	945972-C3	33.00
.250 (1/4)		.2500	.375 (1.5x)	4	1/4	2-1/2	965016-C3	37.70
.250 (1/4)		.2500	.750 (3x)	4	1/4	2-1/2	958616-C3	37.70
.250 (1/4)		.2500	1.250 (5x)	4	1/4	4	952716-C3	44.30
.375 (3/8)		.3750	1.125 (3x)	4	3/8	2-1/2	958624-C3	47.10

PLEASE SEE SPEEDS & FEEDS ON PAGE 161

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Square – Long Reach, Stub Flute



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA 

MEDIUM ALLOY STEELS

CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
D ₁ +.0005" -.0005"	D ₁ +.00mm -.02mm	decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm	L ₃ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.015 (1/64)		.0150	.023	.078 (5x)	3	1/8	2-1/2	936115-C3	57.10
.015 (1/64)		.0150	.023	.125 (8x)	3	1/8	2-1/2	933815-C3	58.50
.020		.0200	.030	.100 (5x)	3	1/8	2-1/2	936120-C3	55.00
.020		.0200	.030	.160 (8x)	3	1/8	2-1/2	933820-C3	56.20
.025		.0250	.038	.125 (5x)	3	1/8	2-1/2	936125-C3	53.50
.025		.0250	.038	.203 (8x)	3	1/8	2-1/2	933825-C3	55.00
.030		.0300	.045	.156 (5x)	3	1/8	2-1/2	936130-C3	50.40
.030		.0300	.045	.250 (8x)	3	1/8	2-1/2	933830-C3	51.50
.031 (1/32)		.0310	.047	.093 (3x)	3	1/8	1-1/2	945331-C3	48.80
.031 (1/32)		.0310	.047	.156 (5x)	3	1/8	2-1/2	936131-C3	50.40
.031 (1/32)		.0310	.047	.250 (8x)	3	1/8	2-1/2	933831-C3	51.50
.031 (1/32)		.0310	.047	.312 (10x)	3	1/8	2-1/2	931131-C3	54.00
1.0 mm		.0393	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	886422-C3	53.30
1.0 mm		.0393	1.50 mm	8.0 mm (8x)	3	4 mm	50 mm	887122-C3	54.80
.040		.0400	.060	.203 (5x)	3	1/8	2-1/2	936140-C3	53.30
.040		.0400	.060	.325 (8x)	3	1/8	2-1/2	933840-C3	54.80
.047 (3/64)		.0470	.071	.250 (5x)	3	1/8	2-1/2	936147-C3	50.40
.047 (3/64)		.0470	.071	.375 (8x)	3	1/8	2-1/2	933847-C3	51.50
.062 (1/16)		.0620	.093	.186 (3x)	3	1/8	1-1/2	945362-C3	49.10
.062 (1/16)		.0620	.093	.312 (5x)	3	1/8	2-1/2	936162-C3	50.10
.062 (1/16)		.0620	.093	.500 (8x)	3	1/8	2-1/2	933862-C3	51.50
.062 (1/16)		.0620	.093	.625 (10x)	3	1/8	2-1/2	931162-C3	54.00
.078 (5/64)		.0780	.118	.406 (5x)	3	1/8	2-1/2	936178-C3	50.10
.078 (5/64)		.0780	.118	.625 (8x)	3	1/8	2-1/2	933878-C3	51.50
2.0 mm		.0787	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	886445-C3	53.30
2.0 mm		.0787	3.00 mm	16.0 mm (8x)	3	4 mm	50 mm	887145-C3	54.80
.093 (3/32)		.0930	.140	.279 (3x)	3	1/8	1-1/2	945393-C3	49.10
.093 (3/32)		.0930	.140	.500 (5x)	3	1/8	2-1/2	936193-C3	50.10
.093 (3/32)		.0930	.140	.750 (8x)	3	1/8	2-1/2	933893-C3	51.50
.093 (3/32)		.0930	.140	.950 (10x)	3	1/8	2-1/2	931193-C3	54.00

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Square – Long Reach, Stub Flute (cont.)



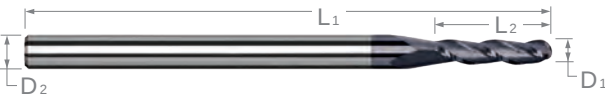
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CUTTER DIAMETER			LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁ +.0005" -.0005"	+ .00 mm -.02 mm	decimal equivalent	L ₂ +.010" -.000" +.25 mm -.00 mm	L ₃ +.010" -.000" +.25 mm -.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.100		.1000	.150	.500 (5x)	3	1/8	2-1/2	936200-C3	53.30
.100		.1000	.150	.800 (8x)	3	1/8	2-1/2	933900-C3	54.80
.109 (7/64)		.1090	.164	.570 (5x)	3	1/8	2-1/2	936202-C3	53.30
.109 (7/64)		.1090	.164	.900 (8x)	3	1/8	2-1/2	933902-C3	54.80
	3.0 mm	.1181	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	886457-C3	54.60
	3.0 mm	.1181	4.50 mm	24.0 mm (8x)	3	4 mm	50 mm	887157-C3	55.80
D ₁ +.000" -.002"		decimal equivalent	L ₂ +.030" -.000"	L ₃ +.030" -.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)		.1250	.187	.375 (3x)	4	1/8	1-1/2	945408-C3	49.10
.125 (1/8)		.1250	.187	.625 (5x)	4	1/8	2-1/2	936208-C3	49.50
.125 (1/8)		.1250	.187	1.000 (8x)	4	1/8	2-1/2	933908-C3	51.00
.125 (1/8)		.1250	.187	1.250 (10x)	4	1/8	2-1/2	931208-C3	51.80
.156 (5/32)		.1562	.235	.750 (5x)	4	3/16	3	936210-C3	55.00
.187 (3/16)		.1875	.285	1.000 (5x)	4	3/16	3	936212-C3	55.00
.250 (1/4)		.2500	.375	1.250 (5x)	4	1/4	4	936216-C3	61.40

PLEASE SEE SPEEDS & FEEDS ON PAGE 163

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Ball



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

MEDIUM ALLOY STEELS

mm & in

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .010" / - .000" / + .25mm / - .00mm					
.2 mm	.0078		.60 mm (3x)	3	4 mm	50 mm	974804-C3	62.20
.010	.0100		.030 (3x)	3	1/8	1-1/2	971810-C3	60.70
.015 (1/64)	.0150		.023 (1.5x)	3	1/8	1-1/2	963015-C3	51.30
.015 (1/64)	.0150		.045 (3x)	3	1/8	1-1/2	971815-C3	51.30
.4 mm	.0157		1.20 mm (3x)	3	4 mm	50 mm	974809-C3	53.90
.5 mm	.0196		1.50 mm (3x)	3	4 mm	50 mm	974811-C3	46.50
.020	.0200		.030 (1.5x)	3	1/8	1-1/2	963020-C3	46.50
.020	.0200		.060 (3x)	3	1/8	1-1/2	971820-C3	46.00
.6 mm	.0236		1.80 mm (3x)	3	4 mm	50 mm	974813-C3	45.00
.025	.0250		.075 (3x)	3	1/8	1-1/2	971825-C3	44.60
.031 (1/32)	.0310		.025 (0.8x)	3	1/8	1-1/2	883931-C3	41.40
.031 (1/32)	.0310		.047 (1.5x)	3	1/8	1-1/2	963031-C3	38.60
.031 (1/32)	.0310		.093 (3x)	3	1/8	1-1/2	971831-C3	38.60
.031 (1/32)	.0310		.156 (5x)	3	1/8	2-1/2	888631-C3	48.40
.8 mm	.0314		2.40 mm (3x)	3	4 mm	50 mm	974818-C3	39.10
1.0 mm	.0393		1.50 mm (1.5x)	3	4 mm	50 mm	929222-C3	39.10
1.0 mm	.0393		3.00 mm (3x)	3	4 mm	50 mm	974822-C3	39.10
.040	.0400		.120 (3x)	3	1/8	1-1/2	971840-C3	38.60
.047 (3/64)	.0470		.038 (0.8x)	3	1/8	1-1/2	883947-C3	42.30
.047 (3/64)	.0470		.071 (1.5x)	3	1/8	1-1/2	963047-C3	38.60
.047 (3/64)	.0470		.141 (3x)	3	1/8	1-1/2	971847-C3	38.60
1.2 mm	.0472		3.50 mm (3x)	3	4 mm	50 mm	974827-C3	39.10
.050	.0500		.150 (3x)	3	1/8	1-1/2	971850-C3	38.60
1.4 mm	.0551		4.00 mm (3x)	3	4 mm	50 mm	974831-C3	39.10
1.5 mm	.0590		4.50 mm (3x)	3	4 mm	50 mm	974833-C3	36.90
.060	.0600		.180 (3x)	3	1/8	1-1/2	971860-C3	38.60
.062 (1/16)	.0620		.050 (0.8x)	3	1/8	1-1/2	883962-C3	39.10
.062 (1/16)	.0620		.093 (1.5x)	3	1/8	1-1/2	963062-C3	36.50
.062 (1/16)	.0620		.186 (3x)	3	1/8	1-1/2	971862-C3	36.50
.062 (1/16)	.0620		.312 (5x)	3	1/8	2-1/2	888662-C3	46.00
1.6 mm	.0629		5.00 mm (3x)	3	4 mm	50 mm	974836-C3	36.90
.070	.0700		.210 (3x)	3	1/8	1-1/2	971870-C3	36.50
1.8 mm	.0708		5.50 mm (3x)	3	4 mm	50 mm	974840-C3	36.90
.078 (5/64)	.0780		.062 (0.8x)	3	1/8	1-1/2	883978-C3	41.20
.078 (5/64)	.0780		.118 (1.5x)	3	1/8	1-1/2	963078-C3	36.50
.078 (5/64)	.0780		.234 (3x)	3	1/8	1-1/2	971878-C3	36.50

continued on next page

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Ball (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	A1TIN COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00 mm - .02 mm	decimal equivalent	+ .010" - .000" + .25 mm - .00 mm					
2.0 mm	.0787		6.00 mm (3x)	3	4 mm	50 mm	974845-C3	36.90
.080	.0800		.240 (3x)	3	1/8	1-1/2	971880-C3	36.50
.090	.0900		.270 (3x)	3	1/8	1-1/2	971890-C3	36.50
.093 (3/32)	.0930		.074 (0.8x)	3	1/8	1-1/2	883993-C3	39.10
.093 (3/32)	.0930		.140 (1.5x)	3	1/8	1-1/2	963093-C3	36.50
.093 (3/32)	.0930		.279 (3x)	3	1/8	1-1/2	971893-C3	36.50
.093 (3/32)	.0930		.500 (5x)	3	1/8	2-1/2	888693-C3	46.00
.100	.1000		.300 (3x)	3	1/8	1-1/2	971900-C3	36.50
.109 (7/64)	.1090		.327 (3x)	3	1/8	1-1/2	971902-C3	36.50
3.0 mm	.1181		4.50 mm (1.5x)	3	4 mm	50 mm	929257-C3	37.10
3.0 mm	.1181		9.00 mm (3x)	3	4 mm	50 mm	974857-C3	37.10

D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .000" - .002"		decimal equivalent	+ .030" - .000"					
.125 (1/8)	.1250		.100 (0.8x)	4	1/8	1-1/2	884008-C3	39.10
.125 (1/8)	.1250		.187 (1.5x)	4	1/8	1-1/2	963108-C3	34.40
.125 (1/8)	.1250		.375 (3x)	4	1/8	1-1/2	971908-C3	34.40
.125 (1/8)	.1250		.625 (5x)	4	1/8	2-1/2	888708-C3	46.00
.140 (9/64)	.1406		.425 (3x)	4	3/16	2	971909-C3	48.40
.156 (5/32)	.1562		.235 (1.5x)	4	3/16	2	963110-C3	38.90
.156 (5/32)	.1562		.470 (3x)	4	3/16	2	971910-C3	38.90
.187 (3/16)	.1875		.150 (0.8x)	4	3/16	2	884012-C3	41.70
.187 (3/16)	.1875		.285 (1.5x)	4	3/16	2	963112-C3	36.70
.187 (3/16)	.1875		.562 (3x)	4	3/16	2	971912-C3	36.70
.250 (1/4)	.2500		.375 (1.5x)	4	1/4	2-1/2	963116-C3	44.90
.250 (1/4)	.2500		.750 (3x)	4	1/4	2-1/2	971916-C3	44.90

SPEEDS & FEEDS (Variable Helix for Medium Alloy Steels)

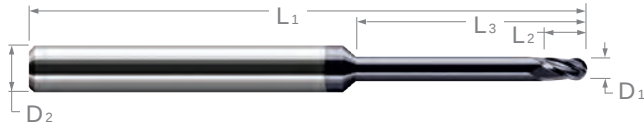
Important Note: Values in table are in inches and are based on standard (3x Dia) length of cut end mills. For shorter lengths of cuts, table values of IPT must be increased (for 0.8x, increase to 125%; for 1.5x, increase to 112%). For longer lengths of cut, table values of IPT and DOC must be reduced (for 4x, reduce to 85%; for 5x, reduce to 70%). For complete speeds and feeds charts, please see www.harveytool.com.

Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter												
			.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	
Carbon Steels: 1030 - 1095, 1140 - 1151, 13xx, 15xx, 20xx, 30xx, 40xx & 4xLxx, 50xx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx 52Lxxx, 60xx, 80xx, 90xx	225 - 250	250	Slotting	.00008	.00017	.00026	.00035	.00043	.00052	.00066	.00099	.00133	.00174	.00209	.00278
			Roughing	.00010	.00021	.00032	.00042	.00052	.00062	.00080	.00120	.00160	.00210	.00252	.00336
			Finishing	.00012	.00025	.00038	.00050	.00063	.00075	.00096	.00144	.00193	.00252	.00303	.00404
			Max	.00016	.00032	.00049	.00064	.00081	.00097	.00124	.00185	.00248	.00324	.00390	.00520
Stainless Steels: 201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 414, 42x, 43x, 44x, 501, 502	250 - 275	220	Radial Depth of Cut*:						Axial Depth of Cut*:						
			Slotting: 1x Dia						Slotting: .5x Dia						
			Roughing: .5x Dia						Roughing: .5x - 1x Dia						
Tool Steels: A, L, O, P, W series	275 - 300	180	Finishing: .1x Dia						Finishing: .5x - 1x Dia						

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Ball – Long Reach, Stub Flute



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

IMPROVES PERFORMANCE

Contour Profiling Tipped Multi-Axis Machining



MEDIUM ALLOY STEELS

mm & in

CUTTER DIAMETER			LENGTH OF CUT L ₂	OVERALL REACH L ₃	FLUTES	SHANK DIAMETER D ₂ (h6)	OVERALL LENGTH L ₁	AlTiN COATED	
D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent						4 FL	PRICE
.015 (1/64)		.0150	.022	.078 (5x)	4	1/8	2-1/2	64215-C3	64.50
.015 (1/64)		.0150	.022	.125 (8x)	4	1/8	2-1/2	56615-C3	65.80
.015 (1/64)		.0150	.022	.187 (12x)	4	1/8	2-1/2	65415-C3	69.80
.4 mm		.0157	.60 mm	2.0 mm (5x)	4	4 mm	50 mm	984709-C3	70.40
.4 mm		.0157	.60 mm	3.2 mm (8x)	4	4 mm	50 mm	971009-C3	71.70
.4 mm		.0157	.60 mm	4.8 mm (12x)	4	4 mm	50 mm	988309-C3	77.40
.5 mm		.0196	.75 mm	2.5 mm (5x)	4	4 mm	50 mm	984711-C3	67.80
.5 mm		.0196	.75 mm	4.0 mm (8x)	4	4 mm	50 mm	971011-C3	69.40
.5 mm		.0196	.75 mm	6.0 mm (12x)	4	4 mm	50 mm	988311-C3	74.90
.5 mm		.0196	.75 mm	8.0 mm (16x)	4	4 mm	50 mm	979511-C3	78.10
.020		.0200	.030	.100 (5x)	4	1/8	2-1/2	64220-C3	61.60
.020		.0200	.030	.160 (8x)	4	1/8	2-1/2	56620-C3	62.80
.020		.0200	.030	.250 (12x)	4	1/8	2-1/2	65420-C3	67.50
.6 mm		.0236	.90 mm	3.0 mm (5x)	4	4 mm	50 mm	984713-C3	66.30
.6 mm		.0236	.90 mm	4.8 mm (8x)	4	4 mm	50 mm	971013-C3	67.60
.6 mm		.0236	.90 mm	7.2 mm (12x)	4	4 mm	50 mm	988313-C3	72.00
.025		.0250	.037	.125 (5x)	4	1/8	2-1/2	64225-C3	60.10
.025		.0250	.037	.203 (8x)	4	1/8	2-1/2	56625-C3	61.20
.025		.0250	.037	.312 (12x)	4	1/8	2-1/2	65425-C3	66.20
.031 (1/32)		.0310	.046	.156 (5x)	4	1/8	2-1/2	64231-C3	56.20
.031 (1/32)		.0310	.046	.250 (8x)	4	1/8	2-1/2	56631-C3	57.50
.031 (1/32)		.0310	.046	.375 (12x)	4	1/8	2-1/2	65431-C3	59.60
.8 mm		.0314	1.20 mm	4.0 mm (5x)	4	4 mm	50 mm	984718-C3	62.00
.8 mm		.0314	1.20 mm	6.5 mm (8x)	4	4 mm	50 mm	971018-C3	63.10
.8 mm		.0314	1.20 mm	9.5 mm (12x)	4	4 mm	50 mm	988318-C3	65.20
1.0 mm		.0393	1.50 mm	5.0 mm (5x)	4	4 mm	50 mm	984722-C3	62.00
1.0 mm		.0393	1.50 mm	8.0 mm (8x)	4	4 mm	50 mm	971022-C3	63.10
1.0 mm		.0393	1.50 mm	12.0 mm (12x)	4	4 mm	50 mm	988322-C3	65.20
1.0 mm		.0393	1.50 mm	16.0 mm (16x)	4	4 mm	50 mm	979522-C3	68.20
.047 (3/64)		.0470	.070	.250 (5x)	4	1/8	2-1/2	64247-C3	56.20
.047 (3/64)		.0470	.070	.375 (8x)	4	1/8	2-1/2	56647-C3	57.50
.047 (3/64)		.0470	.070	.570 (12x)	4	1/8	2-1/2	65447-C3	59.60
1.5 mm		.0590	2.20 mm	7.5 mm (5x)	4	4 mm	50 mm	984733-C3	62.00
1.5 mm		.0590	2.20 mm	12.0 mm (8x)	4	4 mm	50 mm	971033-C3	63.10
1.5 mm		.0590	2.20 mm	18.0 mm (12x)	4	4 mm	50 mm	988333-C3	65.20
1.5 mm		.0590	2.20 mm	24.0 mm (16x)	4	4 mm	63 mm	979533-C3	68.20

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Ball – Long Reach, Stub Flute (cont.)



continued from previous page

	CUTTER DIAMETER		LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AISI 316 COATED	
	D ₁		L ₂	L ₃		D ₂ (h6)	L ₁	4 FL	PRICE
	$+0.0005"$ $-0.0005"$	$+0.00$ mm -0.02 mm	decimal equivalent	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm				
NEW	.062 (1/16)	.0620	.093	.186 (3x)	4	1/8	1-1/2	755462-C3	54.40
	.062 (1/16)	.0620	.093	.312 (5x)	4	1/8	2-1/2	64262-C3	56.20
	.062 (1/16)	.0620	.093	.500 (8x)	4	1/8	2-1/2	56662-C3	57.50
	.062 (1/16)	.0620	.093	.750 (12x)	4	1/8	2-1/2	65462-C3	59.60
NEW	.078 (5/64)	.0780	.117	.234 (3x)	4	1/8	1-1/2	755478-C3	54.40
	.078 (5/64)	.0780	.117	.406 (5x)	4	1/8	2-1/2	64278-C3	56.20
	.078 (5/64)	.0780	.117	.625 (8x)	4	1/8	2-1/2	56678-C3	57.50
	.078 (5/64)	.0780	.117	.940 (12x)	4	1/8	2-1/2	65478-C3	59.60
	2.0 mm	.0787	3.00 mm	10.0 mm (5x)	4	4 mm	50 mm	984745-C3	62.00
	2.0 mm	.0787	3.00 mm	16.0 mm (8x)	4	4 mm	50 mm	971045-C3	63.10
	2.0 mm	.0787	3.00 mm	24.0 mm (12x)	4	4 mm	63 mm	988345-C3	65.20
	2.0 mm	.0787	3.00 mm	32.0 mm (16x)	4	4 mm	63 mm	979545-C3	68.20
NEW	.093 (3/32)	.0930	.139	.279 (3x)	4	1/8	1-1/2	755493-C3	54.40
	.093 (3/32)	.0930	.139	.500 (5x)	4	1/8	2-1/2	64293-C3	56.20
	.093 (3/32)	.0930	.139	.750 (8x)	4	1/8	2-1/2	56693-C3	57.50
	.093 (3/32)	.0930	.139	1.125 (12x)	4	1/8	2-1/2	65493-C3	59.60
	3.0 mm	.1181	4.50 mm	15.0 mm (5x)	4	4 mm	50 mm	984757-C3	59.10

	D ₁		L ₂	L ₃		D ₂ (h6)	L ₁	4 FL	PRICE
	$+0.000"$ $-0.002"$	decimal equivalent	$+0.030"$ $-0.000"$	$+0.030"$ $-0.000"$					
NEW	.125 (1/8)	.1250	.187	.375 (3x)	4	1/8	2-1/2	755508-C3	55.60
	.125 (1/8)	.1250	.187	.625 (5x)	4	1/8	2-1/2	64308-C3	55.60
	.125 (1/8)	.1250	.187	1.000 (8x)	4	1/8	2-1/2	56708-C3	56.90
	.125 (1/8)	.1250	.187	1.500 (12x)	4	1/8	3	65508-C3	59.60
	.156 (5/32)	.1562	.234	.750 (5x)	4	3/16	3	64310-C3	61.20
	.156 (5/32)	.1562	.234	1.250 (8x)	4	3/16	3	56710-C3	62.50
	.187 (3/16)	.1875	.281	1.000 (5x)	4	3/16	3	64312-C3	61.90
	.187 (3/16)	.1875	.281	1.500 (8x)	4	3/16	3	56712-C3	63.10
NEW	.250 (1/4)	.2500	.375	.750 (3x)	4	1/4	4	755516-C3	68.20
	.250 (1/4)	.2500	.375	1.250 (5x)	4	1/4	4	64316-C3	68.20
	.250 (1/4)	.2500	.375	2.000 (8x)	4	1/4	4	56716-C3	69.60

SPEEDS & FEEDS (Variable Helix – Long Reach, Stub Flute for Medium Alloy Steels)

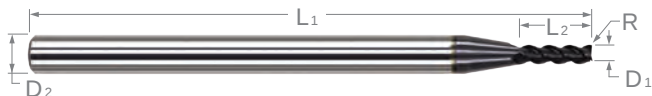
Important Note: Values in table are in inches and are based on reached (8x Dia) end mills. For shorter reaches, table values of IPT must be increased (for 3x, increase to 135%; for 5x, increase to 125%). For longer reaches, table values of IPT and DOC must be reduced (for 10x, reduce to 90%; for 12x, reduce to 80%; for 16x, reduce to 75%) For complete speeds and feeds charts, please see www.harveytool.com.

Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter									
			.015	.031	.047	.062	.078	.093	.125	.187	.250	
Carbon Steels: 1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx 52Lxxx, 6xxx, 8xxx, 9xxx	225 - 250	250	Slotting	.00007	.00014	.00021	.00028	.00035	.00041	.00053	.00079	.00106
			Roughing	.00008	.00017	.00025	.00033	.00042	.00050	.00064	.00096	.00128
	250 - 275	220	Finishing	.00010	.00020	.00030	.00040	.00050	.00060	.00077	.00115	.00154
			Max	.00012	.00026	.00039	.00052	.00065	.00077	.00099	.00148	.00198
Stainless Steels: 201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 414, 42x, 43x, 44x, 501, 502	275 - 300	180	Radial Depth of Cut*:				Axial Depth of Cut*:					
			Slotting: 1x Dia				Slotting: .35x Dia					
			Roughing: .35x Dia				Roughing: .5x - 1x Dia					
			Finishing: .1x Dia				Finishing: .5x - 1x Dia					
Tool Steels: A, L, O, P, W series												

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA 

mm & in

CUTTER DIAMETER	CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITiN COATED	
D ₁ +.0005" -.0005"	R +.001" -.001" +.025mm -.025mm	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.2 mm	.0078	.30 mm (1.5x)	3	4 mm	50 mm	985604-C3	57.10
.2 mm	.0078	.60 mm (3x)	3	4 mm	50 mm	976804-C3	57.10
.010	.0100	.015 (1.5x)	3	1/8	1-1/2	52610-C3	53.90
.010	.0100	.030 (3x)	3	1/8	1-1/2	45610-C3	53.90
.3 mm	.0118	.90 mm (3x)	3	4 mm	50 mm	976806-C3	56.00
.015 (1/64)	.0150	.022 (1.5x)	3	1/8	1-1/2	52615-C3	44.60
.015 (1/64)	.0150	.045 (3x)	3	1/8	1-1/2	45615-C3	44.60
.015 (1/64)	.0150	.078 (5x)	3	1/8	2-1/2	53815-C3	54.00
.4 mm	.0157	.60 mm (1.5x)	3	4 mm	50 mm	985609-C3	47.70
.4 mm	.0157	1.20 mm (3x)	3	4 mm	50 mm	976809-C3	47.70
.5 mm	.0196	.75 mm (1.5x)	3	4 mm	50 mm	985611-C3	42.70
.5 mm	.0196	1.50 mm (3x)	3	4 mm	50 mm	976811-C3	42.70
.020	.0200	.030 (1.5x)	3	1/8	1-1/2	52620-C3	39.10
.020	.0200	.060 (3x)	3	1/8	1-1/2	45620-C3	39.10
.020	.0200	.100 (5x)	3	1/8	2-1/2	53820-C3	47.90
.6 mm	.0236	.90 mm (1.5x)	3	4 mm	50 mm	985613-C3	41.40
.6 mm	.0236	1.80 mm (3x)	3	4 mm	50 mm	976813-C3	41.40
.025	.0250	.038 (1.5x)	3	1/8	1-1/2	52625-C3	37.80
.025	.0250	.075 (3x)	3	1/8	1-1/2	45625-C3	37.80
.025	.0250	.125 (5x)	3	1/8	2-1/2	53825-C3	46.50
.7 mm	.0275	2.10 mm (3x)	3	4 mm	50 mm	976815-C3	41.40
.031 (1/32)	.0310	.047 (1.5x)	3	1/8	1-1/2	52631-C3	31.90
.031 (1/32)	.0310	.093 (3x)	3	1/8	1-1/2	45631-C3	31.90
.031 (1/32)	.0310	.156 (5x)	3	1/8	2-1/2	53831-C3	40.10
.031 (1/32)	.0310	.093 (3x)	3	1/8	1-1/2	907231-C3	31.80
.8 mm	.0314	1.20 mm (1.5x)	3	4 mm	50 mm	985618-C3	35.70
.8 mm	.0314	2.40 mm (3x)	3	4 mm	50 mm	976818-C3	35.70
.035	.0350	.053 (1.5x)	3	1/8	1-1/2	52635-C3	32.00
.035	.0350	.105 (3x)	3	1/8	1-1/2	45635-C3	32.00
.035	.0350	.187 (5x)	3	1/8	2-1/2	53835-C3	40.10
.9 mm	.0354	2.70 mm (3x)	3	4 mm	50 mm	976820-C3	35.70

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius (cont.)



continued from previous page

MEDIUM ALLOY STEELS

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁			R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005"	+ .00 mm	decimal	+ .001"	+ .010"					
- .0005"	- .02 mm	equivalent	- .001"	- .000"					
			+ .025 mm	+ .25 mm					
			- .025 mm	- .00 mm					
1.0 mm	.0393		.10 mm	1.50 mm (1.5x)	3	4 mm	50 mm	985622-C3	35.70
1.0 mm	.0393		.10 mm	3.00 mm (3x)	3	4 mm	50 mm	976822-C3	35.70
.040	.0400		.005	.060 (1.5x)	3	1/8	1-1/2	52640-C3	32.00
.040	.0400		.005	.120 (3x)	3	1/8	1-1/2	45640-C3	32.00
.040	.0400		.005	.203 (5x)	3	1/8	2-1/2	53840-C3	40.10
1.1 mm	.0433		.10 mm	3.00 mm (3x)	3	4 mm	50 mm	976824-C3	35.70
.045	.0450		.005	.068 (1.5x)	3	1/8	1-1/2	52645-C3	32.00
.045	.0450		.005	.135 (3x)	3	1/8	1-1/2	45645-C3	32.00
.045	.0450		.005	.225 (5x)	3	1/8	2-1/2	53845-C3	40.10
.047 (3/64)	.0470		.005	.071 (1.5x)	3	1/8	1-1/2	52647-C3	31.90
.047 (3/64)	.0470		.005	.141 (3x)	3	1/8	1-1/2	45647-C3	31.90
.047 (3/64)	.0470		.005	.250 (5x)	3	1/8	2-1/2	53847-C3	40.10
.047 (3/64)	.0470		.010	.141 (3x)	3	1/8	1-1/2	907247-C3	31.90
.047 (3/64)	.0470		.015	.141 (3x)	3	1/8	1-1/2	903447-C3	31.90
1.2 mm	.0472		.10 mm	1.80 mm (1.5x)	3	4 mm	50 mm	985627-C3	35.70
1.2 mm	.0472		.10 mm	3.50 mm (3x)	3	4 mm	50 mm	976827-C3	35.70
.050	.0500		.005	.075 (1.5x)	3	1/8	1-1/2	52650-C3	32.00
.050	.0500		.005	.150 (3x)	3	1/8	1-1/2	45650-C3	32.00
.050	.0500		.005	.250 (5x)	3	1/8	2-1/2	53850-C3	40.10
1.3 mm	.0511		.10 mm	4.00 mm (3x)	3	4 mm	50 mm	976829-C3	35.70
.055	.0550		.005	.083 (1.5x)	3	1/8	1-1/2	52655-C3	32.00
.055	.0550		.005	.165 (3x)	3	1/8	1-1/2	45655-C3	32.00
.055	.0550		.005	.275 (5x)	3	1/8	2-1/2	53855-C3	40.10
1.4 mm	.0551		.10 mm	2.10 mm (1.5x)	3	4 mm	50 mm	985631-C3	35.70
1.4 mm	.0551		.10 mm	4.00 mm (3x)	3	4 mm	50 mm	976831-C3	35.70
1.5 mm	.0590		.20 mm	2.20 mm (1.5x)	3	4 mm	50 mm	985633-C3	33.60
1.5 mm	.0590		.20 mm	4.50 mm (3x)	3	4 mm	50 mm	976833-C3	33.60
.060	.0600		.010	.090 (1.5x)	3	1/8	1-1/2	52660-C3	32.00
.060	.0600		.010	.180 (3x)	3	1/8	1-1/2	45660-C3	32.00
.060	.0600		.010	.312 (5x)	3	1/8	2-1/2	53860-C3	40.10
.062 (1/16)	.0620		.005	.093 (1.5x)	3	1/8	1-1/2	881862-C3	29.60
.062 (1/16)	.0620		.005	.186 (3x)	3	1/8	1-1/2	913862-C3	29.60
.062 (1/16)	.0620		.005	.312 (5x)	3	1/8	2-1/2	759662-C3	38.60
.062 (1/16)	.0620		.010	.093 (1.5x)	3	1/8	1-1/2	52662-C3	29.60
.062 (1/16)	.0620		.010	.186 (3x)	3	1/8	1-1/2	45662-C3	29.60
.062 (1/16)	.0620		.010	.312 (5x)	3	1/8	2-1/2	53862-C3	38.60
.062 (1/16)	.0620		.015	.186 (3x)	3	1/8	1-1/2	903462-C3	29.60
.062 (1/16)	.0620		.020	.186 (3x)	3	1/8	1-1/2	931362-C3	29.60
1.6 mm	.0629		.20 mm	2.40 mm (1.5x)	3	4 mm	50 mm	985636-C3	33.60
1.6 mm	.0629		.20 mm	5.00 mm (3x)	3	4 mm	50 mm	976836-C3	33.60
1.7 mm	.0669		.20 mm	5.00 mm (3x)	3	4 mm	50 mm	976838-C3	33.60
.070	.0700		.010	.105 (1.5x)	3	1/8	1-1/2	52670-C3	29.70
.070	.0700		.010	.210 (3x)	3	1/8	1-1/2	45670-C3	29.70
1.8 mm	.0708		.20 mm	2.70 mm (1.5x)	3	4 mm	50 mm	985640-C3	33.60
1.8 mm	.0708		.20 mm	5.50 mm (3x)	3	4 mm	50 mm	976840-C3	33.60

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius (cont.)



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	CUTTER DIAMETER		CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	A1TiN COATED	
	D ₁ +.0005" -.0005"	+ .00 mm -.02 mm decimal equivalent	R +.001" -.001" +.025 mm -.025 mm	L ₂ +.010" -.000" +.25 mm -.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE
NEW	1.9 mm	.0748	.20 mm	5.50 mm (3x)	3	4 mm	50 mm	976842-C3	33.60
	.078 (5/64)	.0780	.005	.118 (1.5x)	3	1/8	1-1/2	881878-C3	29.70
	.078 (5/64)	.0780	.005	.234 (3x)	3	1/8	1-1/2	913878-C3	29.70
	.078 (5/64)	.0780	.010	.118 (1.5x)	3	1/8	1-1/2	52678-C3	29.70
	.078 (5/64)	.0780	.010	.234 (3x)	3	1/8	1-1/2	45678-C3	29.70
	.078 (5/64)	.0780	.010	.406 (5x)	3	1/8	2-1/2	53878-C3	38.60
	.078 (5/64)	.0780	.015	.234 (3x)	3	1/8	1-1/2	903478-C3	29.70
	.078 (5/64)	.0780	.020	.234 (3x)	3	1/8	1-1/2	931378-C3	29.70
	2.0 mm	.0787	.20 mm	3.00 mm (1.5x)	3	4 mm	50 mm	985645-C3	33.60
	2.0 mm	.0787	.20 mm	6.00 mm (3x)	3	4 mm	50 mm	976845-C3	33.60
	.080	.0800	.010	.120 (1.5x)	3	1/8	1-1/2	52680-C3	29.70
	.080	.0800	.010	.240 (3x)	3	1/8	1-1/2	45680-C3	29.70
	.090	.0900	.010	.270 (3x)	3	1/8	1-1/2	45690-C3	29.70
	.093 (3/32)	.0930	.005	.140 (1.5x)	3	1/8	1-1/2	881893-C3	29.60
	.093 (3/32)	.0930	.005	.279 (3x)	3	1/8	1-1/2	913893-C3	29.60
	.093 (3/32)	.0930	.005	.500 (5x)	3	1/8	2-1/2	759693-C3	38.60
	.093 (3/32)	.0930	.010	.140 (1.5x)	3	1/8	1-1/2	52693-C3	29.60
	.093 (3/32)	.0930	.010	.279 (3x)	3	1/8	1-1/2	45693-C3	29.60
	.093 (3/32)	.0930	.010	.500 (5x)	3	1/8	2-1/2	53893-C3	38.60
	.093 (3/32)	.0930	.015	.140 (1.5x)	3	1/8	1-1/2	792393-C3	29.60
	.093 (3/32)	.0930	.015	.279 (3x)	3	1/8	1-1/2	903493-C3	29.60
	.093 (3/32)	.0930	.020	.279 (3x)	3	1/8	1-1/2	931393-C3	29.60
	.093 (3/32)	.0930	.030	.279 (3x)	3	1/8	1-1/2	927893-C3	34.70
	2.5 mm	.0984	.20 mm	3.70 mm (1.5x)	3	4 mm	50 mm	985651-C3	33.60
	2.5 mm	.0984	.20 mm	7.50 mm (3x)	3	4 mm	50 mm	976851-C3	33.60
	.100	.1000	.010	.150 (1.5x)	3	1/8	1-1/2	52700-C3	29.70
	.100	.1000	.010	.300 (3x)	3	1/8	1-1/2	45700-C3	29.70
	.100	.1000	.010	.500 (5x)	3	1/8	2-1/2	53900-C3	38.30
	.109 (7/64)	.1090	.010	.164 (1.5x)	3	1/8	1-1/2	52702-C3	29.70
	.109 (7/64)	.1090	.010	.327 (3x)	3	1/8	1-1/2	45702-C3	29.70
	3.0 mm	.1181	.20 mm	4.50 mm (1.5x)	3	4 mm	50 mm	985657-C3	33.60
	3.0 mm	.1181	.20 mm	9.00 mm (3x)	3	4 mm	50 mm	976857-C3	33.60
NEW	D ₁ +.000" -.002"	decimal equivalent	R +.001" -.001"	L ₂ +.030" -.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
	.125 (1/8)	.1250	.005	.187 (1.5x)	4	1/8	1-1/2	881908-C3	29.70
	.125 (1/8)	.1250	.005	.375 (3x)	4	1/8	1-1/2	913908-C3	29.70
	.125 (1/8)	.1250	.010	.375 (3x)	4	1/8	1-1/2	907308-C3	28.00
	.125 (1/8)	.1250	.015	.187 (1.5x)	4	1/8	1-1/2	52708-C3	28.00
	.125 (1/8)	.1250	.015	.375 (3x)	4	1/8	1-1/2	45708-C3	28.00
	.125 (1/8)	.1250	.015	.625 (5x)	4	1/8	2-1/2	53908-C3	38.60
	.125 (1/8)	.1250	.020	.187 (1.5x)	4	1/8	1-1/2	778708-C3	28.00
	.125 (1/8)	.1250	.020	.375 (3x)	4	1/8	1-1/2	931408-C3	28.00
	.125 (1/8)	.1250	.020	.625 (5x)	4	1/8	2-1/2	767308-C3	38.00
	.125 (1/8)	.1250	.030	.375 (3x)	4	1/8	1-1/2	927908-C3	33.20
	.140 (9/64)	.1406	.015	.220 (1.5x)	4	3/16	2	52709-C3	35.80
	.140 (9/64)	.1406	.015	.425 (3x)	4	3/16	2	45709-C3	35.80

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius (cont.)



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MEDIUM ALLOY STEELS

CUTTER DIAMETER		CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁ $\begin{smallmatrix} +.000" \\ -.002" \end{smallmatrix}$	decimal equivalent	R $\begin{smallmatrix} +.001" \\ -.001" \end{smallmatrix}$	L ₂ $\begin{smallmatrix} +.030" \\ -.000" \end{smallmatrix}$		D ₂ (h6)	L ₁	TOOL #	PRICE
.156 (5/32)	.1562	.015	.235 (1.5x)	4	3/16	2	52710-C3	32.20
.156 (5/32)	.1562	.015	.470 (3x)	4	3/16	2	45710-C3	32.20
.156 (5/32)	.1562	.015	.750 (5x)	4	3/16	3	53910-C3	41.70
.156 (5/32)	.1562	.030	.470 (3x)	4	3/16	2	927910-C3	37.30
.187 (3/16)	.1875	.005	.562 (3x)	4	3/16	2	913912-C3	32.10
.187 (3/16)	.1875	.010	.562 (3x)	4	3/16	2	907312-C3	32.10
.187 (3/16)	.1875	.015	.285 (1.5x)	4	3/16	2	52712-C3	30.40
.187 (3/16)	.1875	.015	.562 (3x)	4	3/16	2	45712-C3	30.40
.187 (3/16)	.1875	.015	1.000 (5x)	4	3/16	3	53912-C3	41.70
.187 (3/16)	.1875	.020	.562 (3x)	4	3/16	2	931412-C3	36.00
.187 (3/16)	.1875	.030	.562 (3x)	4	3/16	2	927912-C3	36.00
.187 (3/16)	.1875	.060	.562 (3x)	4	3/16	2	816812-C3	36.00
.250 (1/4)	.2500	.015	.375 (1.5x)	4	1/4	2-1/2	52716-C3	38.30
.250 (1/4)	.2500	.015	.750 (3x)	4	1/4	2-1/2	45716-C3	38.30
.250 (1/4)	.2500	.015	1.250 (5x)	4	1/4	4	53916-C3	51.80
.250 (1/4)	.2500	.020	.750 (3x)	4	1/4	2-1/2	931416-C3	38.30
.250 (1/4)	.2500	.060	.750 (3x)	4	1/4	2-1/2	816816-C3	38.30
.312 (5/16)	.3125	.015	.470 (1.5x)	4	5/16	2-1/2	52720-C3	56.30
.312 (5/16)	.3125	.015	1.000 (3x)	4	5/16	2-1/2	45720-C3	56.30
.375 (3/8)	.3750	.015	.570 (1.5x)	4	3/8	2-1/2	52724-C3	65.40
.375 (3/8)	.3750	.015	1.125 (3x)	4	3/8	2-1/2	45724-C3	65.40
.500 (1/2)	.5000	.030	.750 (1.5x)	4	1/2	3	52732-C3	84.60

PLEASE SEE SPEEDS & FEEDS ON PAGE 161

NEW

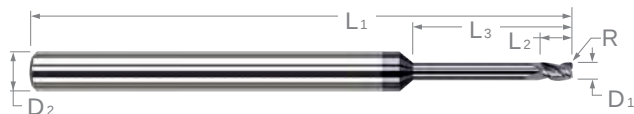
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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius – Long Reach, Stub Flute



- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 37°) reduces chatter and harmonics and increases material removal rates
- Corner radius for improved strength
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm	decimal equivalent	+ .001" / - .001" / + .025 mm / - .025 mm	+ .010" / - .000" / + .25 mm / - .00 mm	+ .010" / - .000" / + .25 mm / - .00 mm					
.015 (1/64)		.0150	.003	.022	.078 (5x)	3	1/8	2-1/2	62415-C3	57.70
.015 (1/64)		.0150	.003	.022	.125 (8x)	3	1/8	2-1/2	55015-C3	58.90
.015 (1/64)		.0150	.003	.022	.187 (12x)	3	1/8	2-1/2	63815-C3	64.50
.4 mm		.0157	.08 mm	.60 mm	2.0 mm (5x)	3	4 mm	50 mm	986709-C3	64.50
.4 mm		.0157	.08 mm	.60 mm	3.2 mm (8x)	3	4 mm	50 mm	978009-C3	65.80
.4 mm		.0157	.08 mm	.60 mm	4.8 mm (12x)	3	4 mm	50 mm	982309-C3	71.40
.5 mm		.0196	.10 mm	.75 mm	2.5 mm (5x)	3	4 mm	50 mm	986711-C3	62.00
.5 mm		.0196	.10 mm	.75 mm	4.0 mm (8x)	3	4 mm	50 mm	978011-C3	63.10
.5 mm		.0196	.10 mm	.75 mm	6.0 mm (12x)	3	4 mm	50 mm	982311-C3	69.10
.5 mm		.0196	.10 mm	.75 mm	8.0 mm (16x)	3	4 mm	50 mm	975511-C3	72.20
.020		.0200	.004	.030	.100 (5x)	3	1/8	2-1/2	62420-C3	55.00
.020		.0200	.004	.030	.160 (8x)	3	1/8	2-1/2	55020-C3	56.20
.020		.0200	.004	.030	.250 (12x)	3	1/8	2-1/2	63820-C3	62.20
.6 mm		.0236	.10 mm	.90 mm	3.0 mm (5x)	3	4 mm	50 mm	986713-C3	60.60
.6 mm		.0236	.10 mm	.90 mm	4.8 mm (8x)	3	4 mm	50 mm	978013-C3	62.00
.6 mm		.0236	.10 mm	.90 mm	7.2 mm (12x)	3	4 mm	50 mm	982313-C3	66.10
.025		.0250	.004	.038	.125 (5x)	3	1/8	2-1/2	62425-C3	53.50
.025		.0250	.004	.038	.203 (8x)	3	1/8	2-1/2	55025-C3	55.00
.025		.0250	.004	.038	.312 (12x)	3	1/8	2-1/2	63825-C3	60.50
.031 (1/32)		.0310	.005	.047	.156 (5x)	3	1/8	2-1/2	62431-C3	50.70
.031 (1/32)		.0310	.005	.047	.250 (8x)	3	1/8	2-1/2	55031-C3	51.80
.031 (1/32)		.0310	.005	.047	.375 (12x)	3	1/8	2-1/2	63831-C3	54.00
.8 mm		.0314	.10 mm	1.20 mm	4.0 mm (5x)	3	4 mm	50 mm	986718-C3	55.90
.8 mm		.0314	.10 mm	1.20 mm	6.5 mm (8x)	3	4 mm	50 mm	978018-C3	57.00
.8 mm		.0314	.10 mm	1.20 mm	9.5 mm (12x)	3	4 mm	50 mm	982318-C3	59.10
.035		.0350	.005	.053	.187 (5x)	3	1/8	2-1/2	62435-C3	51.00
1.0 mm		.0393	.10 mm	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	986722-C3	55.90
1.0 mm		.0393	.10 mm	1.50 mm	8.0 mm (8x)	3	4 mm	50 mm	978022-C3	57.00
1.0 mm		.0393	.10 mm	1.50 mm	12.0 mm (12x)	3	4 mm	50 mm	982322-C3	59.10
1.0 mm		.0393	.10 mm	1.50 mm	16.0 mm (16x)	3	4 mm	50 mm	975522-C3	62.50
.040		.0400	.005	.060	.203 (5x)	3	1/8	2-1/2	62440-C3	51.00
.045		.0450	.005	.068	.225 (5x)	3	1/8	2-1/2	62445-C3	51.00
.047 (3/64)		.0470	.005	.070	.250 (5x)	3	1/8	2-1/2	62447-C3	51.00
.047 (3/64)		.0470	.005	.070	.375 (8x)	3	1/8	2-1/2	55047-C3	51.80
.047 (3/64)		.0470	.005	.070	.570 (12x)	3	1/8	2-1/2	63847-C3	54.00

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Corner Radius – Long Reach, Stub Flute (cont.)



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MEDIUM ALLOY STEELS

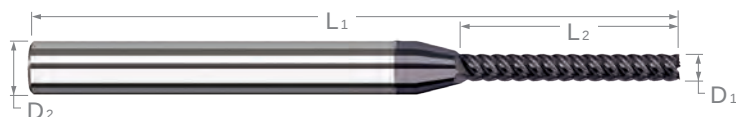
CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
$+0.0005"$ $-0.0005"$	$+0.00$ -0.02 mm	decimal equivalent	$+0.001"$ $-0.001"$ $+0.025$ mm -0.025 mm	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm					
.050		.0500	.005	.075	.250 (5x)	3	1/8	2-1/2	62450-C3	50.40
.055		.0550	.005	.083	.275 (5x)	3	1/8	2-1/2	62455-C3	50.40
	1.5 mm	.0590	.20 mm	2.20 mm	7.5 mm (5x)	3	4 mm	50 mm	986733-C3	55.90
	1.5 mm	.0590	.20 mm	2.20 mm	12.0 mm (8x)	3	4 mm	50 mm	978033-C3	57.00
	1.5 mm	.0590	.20 mm	2.20 mm	18.0 mm (12x)	3	4 mm	50 mm	982333-C3	59.10
	1.5 mm	.0590	.20 mm	2.20 mm	24.0 mm (16x)	3	4 mm	63 mm	975533-C3	62.50
.060		.0600	.010	.090	.312 (5x)	3	1/8	2-1/2	62460-C3	51.00
.062 (1/16)		.0620	.005	.093	.312 (5x)	3	1/8	2-1/2	815662-C3	52.90
.062 (1/16)		.0620	.005	.093	.500 (8x)	3	1/8	2-1/2	816562-C3	54.00
.062 (1/16)		.0620	.010	.093	.312 (5x)	3	1/8	2-1/2	62462-C3	50.70
.062 (1/16)		.0620	.010	.093	.500 (8x)	3	1/8	2-1/2	55062-C3	51.80
.062 (1/16)		.0620	.010	.093	.750 (12x)	3	1/8	2-1/2	63862-C3	54.00
.078 (5/64)		.0780	.010	.117	.406 (5x)	3	1/8	2-1/2	62478-C3	50.70
.078 (5/64)		.0780	.010	.117	.625 (8x)	3	1/8	2-1/2	55078-C3	51.80
.078 (5/64)		.0780	.010	.117	.940 (12x)	3	1/8	2-1/2	63878-C3	54.00
	2.0 mm	.0787	.20 mm	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	986745-C3	55.90
	2.0 mm	.0787	.20 mm	3.00 mm	16.0 mm (8x)	3	4 mm	50 mm	978045-C3	57.00
	2.0 mm	.0787	.20 mm	3.00 mm	24.0 mm (12x)	3	4 mm	63 mm	982345-C3	59.10
	2.0 mm	.0787	.20 mm	3.00 mm	32.0 mm (16x)	3	4 mm	63 mm	975545-C3	62.50
.093 (3/32)		.0930	.005	.139	.500 (5x)	3	1/8	2-1/2	815693-C3	52.90
.093 (3/32)		.0930	.005	.139	.750 (8x)	3	1/8	2-1/2	816593-C3	54.00
.093 (3/32)		.0930	.010	.139	.500 (5x)	3	1/8	2-1/2	62493-C3	50.70
.093 (3/32)		.0930	.010	.139	.750 (8x)	3	1/8	2-1/2	55093-C3	51.80
.093 (3/32)		.0930	.010	.139	1.125 (12x)	3	1/8	2-1/2	63893-C3	54.00
.100		.1000	.010	.150	.500 (5x)	3	1/8	2-1/2	62500-C3	52.30
	3.0 mm	.1181	.20 mm	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	986757-C3	53.00

D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	TOOL #	PRICE
$+0.000"$ $-0.002"$		decimal equivalent	$+0.001"$ $-0.001"$	$+0.030"$ $-0.000"$	$+0.030"$ $-0.000"$					
.125 (1/8)		.1250	.010	.187	.625 (5x)	4	1/8	2-1/2	815708-C3	50.40
.125 (1/8)		.1250	.010	.187	1.000 (8x)	4	1/8	2-1/2	816608-C3	51.50
.125 (1/8)		.1250	.015	.187	.625 (5x)	4	1/8	2-1/2	62508-C3	50.40
.125 (1/8)		.1250	.015	.187	1.000 (8x)	4	1/8	2-1/2	55108-C3	51.50
.125 (1/8)		.1250	.015	.187	1.500 (12x)	4	1/8	3	63908-C3	54.00
.156 (5/32)		.1562	.015	.235	.750 (5x)	4	3/16	3	62510-C3	55.60
.156 (5/32)		.1562	.015	.235	1.250 (8x)	4	3/16	3	55110-C3	56.90
.156 (5/32)		.1562	.015	.235	1.875 (12x)	4	3/16	4	63910-C3	69.60
.156 (5/32)		.1562	.030	.235	1.250 (8x)	4	3/16	3	817310-C3	62.10
.187 (3/16)		.1875	.015	.281	1.000 (5x)	4	3/16	3	62512-C3	55.60
.187 (3/16)		.1875	.015	.281	1.500 (8x)	4	3/16	3	55112-C3	56.90
.187 (3/16)		.1875	.015	.281	2.250 (12x)	4	3/16	4	63912-C3	69.60
.187 (3/16)		.1875	.030	.281	1.500 (8x)	4	3/16	3	817312-C3	62.10
.250 (1/4)		.2500	.015	.375	1.250 (5x)	4	1/4	4	62516-C3	61.90
.250 (1/4)		.2500	.015	.375	2.000 (8x)	4	1/4	4	55116-C3	63.10
.250 (1/4)		.2500	.015	.375	3.000 (12x)	4	1/4	6	63916-C3	76.90

PLEASE SEE SPEEDS & FEEDS ON PAGE 163

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Finishers – Square



Down to
.2 mm!

- Optimized for readily machinable medium alloy steels, stainless steels, and tool steels
- Multi-flute, high helix (approx. 44°), coated design improves finishing in carbon steels, 300 and 400 stainless steels, and machinable tool steels
- Can be used in light duty roughing and profiling applications
- AlTiN Nano coating offers superior hardness and heat resistance
- h6 shank tolerance for high precision tool holders
- End cutting (not center cutting)
- Solid carbide
- CNC ground in the USA

MEDIUM ALLOY STEELS

mm & in	CUTTER DIAMETER			LENGTH OF CUT L ₂	FLUTES	SHANK DIAMETER D ₂ (h6)	OVERALL LENGTH L ₁	AlTiN NANO COATED	
	D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent					TOOL #	PRICE
NEW	.2 mm	.0078		.60 mm (3x)	4	4 mm	50 mm	977704-C6	53.50
	.2 mm	.0078		1.00 mm (5x)	4	4 mm	50 mm	980104-C6	61.90
	.2 mm	.0078		1.60 mm (8x)	4	4 mm	50 mm	981704-C6	63.40
	.010	.0100		.050 (5x)	4	1/8	2-1/2	53310-C6	53.90
	.3 mm	.0118		.90 mm (3x)	4	4 mm	50 mm	977706-C6	49.50
	.015 (1/64)	.0150		.045 (3x)	4	1/8	1-1/2	24315-C6	43.40
	.015 (1/64)	.0150		.078 (5x)	4	1/8	2-1/2	53315-C6	53.90
	.015 (1/64)	.0150		.125 (8x)	4	1/8	2-1/2	62815-C6	55.60
	.4 mm	.0157		1.20 mm (3x)	4	4 mm	50 mm	977709-C6	47.10
	.4 mm	.0157		2.00 mm (5x)	4	4 mm	50 mm	980109-C6	55.60
	.4 mm	.0157		3.20 mm (8x)	4	4 mm	50 mm	981709-C6	56.90
	.5 mm	.0196		1.50 mm (3x)	4	4 mm	50 mm	977711-C6	46.50
	.5 mm	.0196		2.50 mm (5x)	4	4 mm	50 mm	980111-C6	54.00
	.5 mm	.0196		4.00 mm (8x)	4	4 mm	50 mm	981711-C6	56.00
	.020	.0200		.030 (1.5x)	4	1/8	1-1/2	935920-C6	42.70
NEW	.020	.0200		.060 (3x)	4	1/8	1-1/2	24320-C6	42.70
	.020	.0200		.080 (4x)	4	1/8	1-1/2	835320-C6	44.60
	.020	.0200		.100 (5x)	4	1/8	2-1/2	53320-C6	53.50
	.020	.0200		.160 (8x)	4	1/8	2-1/2	62820-C6	54.60
	.6 mm	.0236		1.80 mm (3x)	4	4 mm	50 mm	977713-C6	46.50
	.6 mm	.0236		3.00 mm (5x)	4	4 mm	50 mm	980113-C6	54.00
	.6 mm	.0236		4.80 mm (8x)	4	4 mm	50 mm	981713-C6	56.00
	.025	.0250		.038 (1.5x)	4	1/8	1-1/2	935925-C6	40.10
	.025	.0250		.075 (3x)	4	1/8	1-1/2	24325-C6	40.10
	.025	.0250		.125 (5x)	4	1/8	2-1/2	53325-C6	51.80
	.025	.0250		.203 (8x)	4	1/8	2-1/2	62825-C6	52.90
	.7 mm	.0275		2.10 mm (3x)	4	4 mm	50 mm	977715-C6	46.50
	.030	.0300		.156 (5x)	5	1/8	2-1/2	53330-C6	49.80
	.031 (1/32)	.0310		.047 (1.5x)	5	1/8	1-1/2	935931-C6	35.70
	.031 (1/32)	.0310		.093 (3x)	5	1/8	1-1/2	24331-C6	35.70
	.031 (1/32)	.0310		.125 (4x)	5	1/8	2-1/2	835331-C6	49.30
	.031 (1/32)	.0310		.156 (5x)	5	1/8	2-1/2	53331-C6	49.80
	.031 (1/32)	.0310		.250 (8x)	5	1/8	2-1/2	62831-C6	50.70
	.031 (1/32)	.0310		.312 (10x)	5	1/8	2-1/2	882431-C6	58.10
	.031 (1/32)	.0310		.375 (12x)	5	1/8	2-1/2	68531-C6	62.50
	.8 mm	.0314		2.40 mm (3x)	5	4 mm	50 mm	977718-C6	40.90
	.8 mm	.0314		4.00 mm (5x)	5	4 mm	50 mm	980118-C6	51.00
	.8 mm	.0314		6.50 mm (8x)	5	4 mm	50 mm	981718-C6	52.50
	.9 mm	.0354		2.70 mm (3x)	5	4 mm	50 mm	977720-C6	40.90

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Finishers – Square (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	+ .010" / - .000" / + .25mm / - .00mm					
1.0 mm	.0393		1.50 mm (1.5x)	5	4 mm	50 mm	778522-C6	40.90
1.0 mm	.0393		3.00 mm (3x)	5	4 mm	50 mm	977722-C6	40.90
1.0 mm	.0393		5.00 mm (5x)	5	4 mm	50 mm	980122-C6	51.00
1.0 mm	.0393		8.00 mm (8x)	5	4 mm	50 mm	981722-C6	52.50
.040	.0400		.060 (1.5x)	5	1/8	1-1/2	935940-C6	35.70
.040	.0400		.120 (3x)	5	1/8	1-1/2	24340-C6	35.70
.040	.0400		.160 (4x)	5	1/8	2-1/2	835340-C6	49.80
.040	.0400		.203 (5x)	5	1/8	2-1/2	53340-C6	49.80
.040	.0400		.325 (8x)	5	1/8	2-1/2	62840-C6	50.70
1.1 mm	.0433		3.00 mm (3x)	5	4 mm	50 mm	977724-C6	40.90
.047 (3/64)	.0470		.071 (1.5x)	5	1/8	1-1/2	935947-C6	35.70
.047 (3/64)	.0470		.141 (3x)	5	1/8	1-1/2	24347-C6	35.70
.047 (3/64)	.0470		.187 (4x)	5	1/8	2-1/2	835347-C6	45.70
.047 (3/64)	.0470		.250 (5x)	5	1/8	2-1/2	53347-C6	49.80
.047 (3/64)	.0470		.375 (8x)	5	1/8	2-1/2	62847-C6	50.70
.047 (3/64)	.0470		.480 (10x)	5	1/8	2-1/2	882447-C6	58.10
.047 (3/64)	.0470		.570 (12x)	5	1/8	2-1/2	68547-C6	62.50
1.2 mm	.0472		3.50 mm (3x)	5	4 mm	50 mm	977727-C6	40.90
1.2 mm	.0472		6.00 mm (5x)	5	4 mm	50 mm	980127-C6	51.00
1.2 mm	.0472		9.50 mm (8x)	5	4 mm	50 mm	981727-C6	52.50
.050	.0500		.075 (1.5x)	5	1/8	1-1/2	935950-C6	35.70
.050	.0500		.150 (3x)	5	1/8	1-1/2	24350-C6	35.70
.050	.0500		.250 (5x)	5	1/8	2-1/2	53350-C6	49.80
.050	.0500		.400 (8x)	5	1/8	2-1/2	62850-C6	50.70
1.3 mm	.0511		4.00 mm (3x)	5	4 mm	50 mm	977729-C6	40.90
1.4 mm	.0551		4.00 mm (3x)	5	4 mm	50 mm	977731-C6	40.90
1.4 mm	.0551		7.00 mm (5x)	5	4 mm	50 mm	980131-C6	51.00
1.4 mm	.0551		11.00 mm (8x)	5	4 mm	50 mm	981731-C6	52.50
1.5 mm	.0590		4.50 mm (3x)	5	4 mm	50 mm	977733-C6	39.50
1.5 mm	.0590		7.50 mm (5x)	5	4 mm	50 mm	980133-C6	49.50
1.5 mm	.0590		12.00 mm (8x)	5	4 mm	50 mm	981733-C6	51.30
.060	.0600		.090 (1.5x)	5	1/8	1-1/2	935960-C6	35.70
.060	.0600		.180 (3x)	5	1/8	1-1/2	24360-C6	35.70
.060	.0600		.312 (5x)	5	1/8	2-1/2	53360-C6	49.80
.060	.0600		.500 (8x)	5	1/8	2-1/2	62860-C6	50.70
.062 (1/16)	.0620		.093 (1.5x)	5	1/8	1-1/2	935962-C6	33.60
.062 (1/16)	.0620		.186 (3x)	5	1/8	1-1/2	24362-C6	33.60
.062 (1/16)	.0620		.250 (4x)	5	1/8	2-1/2	835362-C6	46.40
.062 (1/16)	.0620		.312 (5x)	5	1/8	2-1/2	53362-C6	46.90
.062 (1/16)	.0620		.375 (6x)	5	1/8	2-1/2	778362-C6	46.90
.062 (1/16)	.0620		.500 (8x)	5	1/8	2-1/2	62862-C6	47.60
.062 (1/16)	.0620		.625 (10x)	5	1/8	2-1/2	882462-C6	59.20
.062 (1/16)	.0620		.750 (12x)	5	1/8	2-1/2	68562-C6	66.70
.062 (1/16)	.0620		.950 (15x)	5	1/8	2-1/2	68962-C6	84.10
1.6 mm	.0629		5.00 mm (3x)	5	4 mm	50 mm	977736-C6	39.50
1.6 mm	.0629		8.00 mm (5x)	5	4 mm	50 mm	980136-C6	49.80
1.6 mm	.0629		13.00 mm (8x)	5	4 mm	50 mm	981736-C6	50.70
1.7 mm	.0669		5.00 mm (3x)	5	4 mm	50 mm	977738-C6	39.50

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Finishers – Square (cont.)



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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
+ .0005" - .0005"	+ .00mm - .02mm	decimal equivalent	+ .010" - .000" + .25mm - .00mm					
.070		.0700	.210	(3x)	5	1/8	1-1/2	24370-C6 33.60
.070		.0700	.375	(5x)	5	1/8	2-1/2	53370-C6 46.90
.070		.0700	.570	(8x)	5	1/8	2-1/2	62870-C6 47.60
1.8 mm	.0708		5.50 mm	(3x)	5	4 mm	50 mm	977740-C6 39.50
1.8 mm	.0708		9.00 mm	(5x)	5	4 mm	50 mm	980140-C6 49.50
1.8 mm	.0708		14.00 mm	(8x)	5	4 mm	50 mm	981740-C6 51.30
1.9 mm	.0748		5.50 mm	(3x)	5	4 mm	50 mm	977742-C6 39.50
.078 (5/64)	.0780		.117	(1.5x)	5	1/8	1-1/2	935978-C6 33.60
.078 (5/64)	.0780		.234	(3x)	5	1/8	1-1/2	24378-C6 33.60
.078 (5/64)	.0780		.312	(4x)	5	1/8	2-1/2	835378-C6 42.80
.078 (5/64)	.0780		.406	(5x)	5	1/8	2-1/2	53378-C6 46.90
.078 (5/64)	.0780		.475	(6x)	5	1/8	2-1/2	778378-C6 46.90
.078 (5/64)	.0780		.625	(8x)	5	1/8	2-1/2	62878-C6 47.60
.078 (5/64)	.0780		.800	(10x)	5	1/8	2-1/2	882478-C6 59.20
.078 (5/64)	.0780		.940	(12x)	5	1/8	2-1/2	68578-C6 66.70
.078 (5/64)	.0780		1.187	(15x)	5	1/8	2-1/2	68978-C6 84.10
2.0 mm	.0787		6.00 mm	(3x)	5	4 mm	50 mm	977745-C6 39.50
2.0 mm	.0787		10.00 mm	(5x)	5	4 mm	50 mm	980145-C6 49.50
2.0 mm	.0787		16.00 mm	(8x)	5	4 mm	50 mm	981745-C6 51.30
.080	.0800		.120	(1.5x)	5	1/8	1-1/2	935980-C6 33.60
.080	.0800		.240	(3x)	5	1/8	1-1/2	24380-C6 33.60
.080	.0800		.406	(5x)	5	1/8	2-1/2	53380-C6 46.90
.080	.0800		.650	(8x)	5	1/8	2-1/2	62880-C6 47.60
.090	.0900		.270	(3x)	5	1/8	1-1/2	24390-C6 33.60
.090	.0900		.450	(5x)	5	1/8	2-1/2	53390-C6 46.90
.090	.0900		.750	(8x)	5	1/8	2-1/2	62890-C6 47.60
.093 (3/32)	.0930		.140	(1.5x)	5	1/8	1-1/2	935993-C6 33.60
.093 (3/32)	.0930		.279	(3x)	5	1/8	1-1/2	24393-C6 33.60
.093 (3/32)	.0930		.375	(4x)	5	1/8	2-1/2	835393-C6 46.40
.093 (3/32)	.0930		.500	(5x)	5	1/8	2-1/2	53393-C6 46.90
.093 (3/32)	.0930		.585	(6x)	5	1/8	2-1/2	778393-C6 46.90
.093 (3/32)	.0930		.750	(8x)	5	1/8	2-1/2	62893-C6 47.60
.093 (3/32)	.0930		.950	(10x)	5	1/8	2-1/2	882493-C6 59.20
.093 (3/32)	.0930		1.125	(12x)	5	1/8	2-1/2	68593-C6 66.70
.093 (3/32)	.0930		1.400	(15x)	5	1/8	3	68993-C6 84.80
2.5 mm	.0984		7.50 mm	(3x)	5	4 mm	50 mm	977751-C6 39.50
2.5 mm	.0984		12.00 mm	(5x)	5	4 mm	50 mm	980151-C6 49.10
.100	.1000		.150	(1.5x)	5	1/8	1-1/2	936000-C6 33.60
.100	.1000		.300	(3x)	5	1/8	1-1/2	24399-C6 33.60
.100	.1000		.500	(5x)	5	1/8	2-1/2	53399-C6 46.90
.100	.1000		.800	(8x)	5	1/8	2-1/2	53400-C6 47.60
.109 (7/64)	.1090		.327	(3x)	5	1/8	1-1/2	24402-C6 33.80
.109 (7/64)	.1090		.570	(5x)	5	1/8	2-1/2	63502-C6 46.90
3.0 mm	.1181		9.00 mm	(3x)	5	4 mm	50 mm	977757-C6 39.50
3.0 mm	.1181		15.00 mm	(5x)	5	4 mm	50 mm	980157-C6 49.10
3.0 mm	.1181		24.00 mm	(8x)	5	4 mm	50 mm	981757-C6 51.50

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VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Finishers – Square (cont.)



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MEDIUM ALLOY STEELS

CUTTER DIAMETER		LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
D ₁ ^{+0.000"} -0.002"		L ₂ ^{+0.030"} -0.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)	.1250	.187 (1.5x)	5	1/8	1-1/2	936008-C6	30.10
.125 (1/8)	.1250	.375 (3x)	5	1/8	1-1/2	795408-C6	30.10
.125 (1/8)	.1250	.500 (4x)	5	1/8	1-1/2	24408-C6	30.10
.125 (1/8)	.1250	.625 (5x)	5	1/8	2-1/2	776908-C6	45.80
.125 (1/8)	.1250	.750 (6x)	5	1/8	2-1/2	63508-C6	45.80
.125 (1/8)	.1250	1.000 (8x)	5	1/8	2-1/2	53408-C6	46.90
.125 (1/8)	.1250	1.125 (10x)	5	1/8	2-1/2	882508-C6	57.70
.125 (1/8)	.1250	1.500 (12x)	5	1/8	3	68608-C6	65.80
.125 (1/8)	.1250	1.875 (15x)	5	1/8	3	69008-C6	83.80
.140 (9/64)	.1406	.500 (3x)	5	3/16	2	24409-C6	44.30
.140 (9/64)	.1406	.750 (5x)	5	3/16	3	63509-C6	45.80
.156 (5/32)	.1562	.235 (1.5x)	5	3/16	2	936010-C6	36.40
.156 (5/32)	.1562	.562 (3x)	5	3/16	2	24410-C6	36.40
.156 (5/32)	.1562	.625 (4x)	5	3/16	3	835410-C6	48.80
.156 (5/32)	.1562	.875 (5x)	5	3/16	3	63510-C6	48.80
.156 (5/32)	.1562	1.250 (8x)	5	3/16	3	53410-C6	49.60
.187 (3/16)	.1875	.285 (1.5x)	5	3/16	2	936012-C6	34.30
.187 (3/16)	.1875	.625 (3x)	5	3/16	2	24412-C6	34.30
.187 (3/16)	.1875	.750 (4x)	5	3/16	3	835412-C6	43.60
.187 (3/16)	.1875	1.000 (5x)	5	3/16	3	63512-C6	48.80
.187 (3/16)	.1875	1.500 (8x)	5	3/16	3	53412-C6	49.60
.250 (1/4)	.2500	.375 (1.5x)	5	1/4	2-1/2	936016-C6	43.60
.250 (1/4)	.2500	.750 (3x)	5	1/4	2-1/2	24416-C6	43.60
.250 (1/4)	.2500	1.250 (5x)	5	1/4	4	63516-C6	59.60
.250 (1/4)	.2500	2.000 (8x)	5	1/4	4	53416-C6	60.70
.375 (3/8)	.3750	1.125 (3x)	5	3/8	2-1/2	24424-C6	69.40
.500 (1/2)	.5000	.750 (1.5x)	5	1/2	3	936032-C6	91.50
.500 (1/2)	.5000	1.500 (3x)	5	1/2	3	24432-C6	90.20
.500 (1/2)	.5000	2.625 (5x)	5	1/2	4	63532-C6	98.50

PLEASE SEE SPEEDS & FEEDS ON PAGE 177

VARIABLE HELIX END MILLS FOR MEDIUM ALLOY STEELS

Finishers

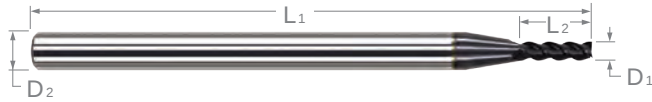
SPEEDS & FEEDS (High-Helix Finishers for Medium Alloy Steels)

Material	Hardness (HBn)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter										Depth of Cut	
				.015	.031	.047	.062	.078	.093	.125	.187	.250	Radial	Axial
Carbon Steels: 1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	225 - 250 250 - 275	600 550	Finishing (1.5x LOC)	.00020	.00041	.00062	.00082	.00103	.00123	.00165	.00247	.00330	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00018	.00037	.00056	.00074	.00094	.00112	.00150	.00224	.00300	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00016	.00032	.00049	.00065	.00081	.00097	.00131	.00195	.00261	< .09x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00011	.00023	.00035	.00047	.00059	.00070	.00094	.00140	.00188	< .07x Dia	5x - 5x Dia
			Finishing (8x LOC)	.00010	.00020	.00031	.00041	.00051	.00061	.00083	.00123	.00165	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00019	.00029	.00039	.00049	.00058	.00078	.00117	.00156	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00019	.00028	.00037	.00047	.00056	.00075	.00112	.00150	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00033	.00042	.00050	.00068	.00101	.00135	< .02x Dia	5x - 15x Dia
	275 - 300	500	Finishing (1.5x LOC)	.00018	.00038	.00057	.00075	.00094	.00113	.00151	.00226	.00303	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00017	.00034	.00052	.00068	.00086	.00102	.00138	.00206	.00275	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00014	.00030	.00045	.00059	.00075	.00089	.00120	.00179	.00239	< .09x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00012	.00026	.00039	.00051	.00064	.00077	.00103	.00154	.00206	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00010	.00021	.00032	.00043	.00054	.00064	.00086	.00129	.00172	< .07x Dia	5x - 5x Dia
			Finishing (8x LOC)	.00009	.00019	.00028	.00038	.00047	.00056	.00076	.00113	.00151	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00018	.00027	.00035	.00045	.00053	.00072	.00107	.00143	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00017	.00026	.00034	.00043	.00051	.00069	.00103	.00138	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00031	.00039	.00046	.00062	.00093	.00124	< .02x Dia	5x - 15x Dia
Stainless Steels: 201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 414, 42x, 43x, 44x, 501, 502 Tool Steels: A, L, O, P, W series	225 - 250 250 - 275	500 500	Finishing (1.5x LOC)	.00017	.00034	.00052	.00068	.00086	.00102	.00138	.00206	.00275	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00015	.00031	.00047	.00062	.00078	.00093	.00125	.00187	.00250	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00013	.00027	.00041	.00054	.00068	.00081	.00109	.00163	.00218	< .09x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00011	.00023	.00035	.00047	.00059	.00070	.00094	.00140	.00188	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00009	.00019	.00029	.00039	.00049	.00058	.00078	.00117	.00156	< .07x Dia	5x - 5x Dia
			Finishing (8x LOC)	.00008	.00017	.00026	.00034	.00043	.00051	.00069	.00103	.00138	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00016	.00024	.00032	.00041	.00048	.00065	.00097	.00130	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00014	.00021	.00028	.00035	.00042	.00056	.00084	.00113	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00028	.00035	.00042	.00056	.00084	.00113	< .02x Dia	5x - 15x Dia
	275 - 300 300 - 350	500 500	Finishing (1.5x LOC)	.00015	.00031	.00047	.00061	.00077	.00092	.00124	.00185	.00248	< .10x Dia	5x - 1.5x Dia
			Finishing (3x LOC)	.00014	.00028	.00042	.00056	.00070	.00084	.00113	.00168	.00225	< .10x Dia	5x - 3x Dia
			Finishing (4x LOC)	.00012	.00024	.00037	.00049	.00061	.00073	.00098	.00146	.00196	< .09x Dia	5x - 4x Dia
			Finishing (5x LOC)	.00010	.00021	.00032	.00042	.00053	.00063	.00084	.00126	.00169	< .07x Dia	5x - 5x Dia
			Finishing (6x LOC)	.00008	.00017	.00026	.00035	.00044	.00052	.00070	.00105	.00141	< .07x Dia	5x - 5x Dia
			Finishing (8x LOC)	.00007	.00015	.00023	.00031	.00039	.00046	.00062	.00093	.00124	< .05x Dia	5x - 8x Dia
			Finishing (10x LOC)	-	.00015	.00022	.00029	.00037	.00044	.00059	.00088	.00117	< .04x Dia	5x - 10x Dia
			Finishing (12x LOC)	-	.00014	.00021	.00028	.00035	.00042	.00056	.00084	.00113	< .04x Dia	5x - 12x Dia
			Finishing (15x LOC)	-	-	-	.00025	.00032	.00038	.00051	.00076	.00101	< .02x Dia	5x - 15x Dia

MEDIUM ALLOY STEELS

VARIABLE HELIX END MILLS FOR FREE MACHINING STEELS

Square



- Optimized for free machining varieties of carbon steels and stainless steels
- Variable helix design (approx. 38°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting Solid carbide CNC ground in the USA 

FREE MACHINING STEELS



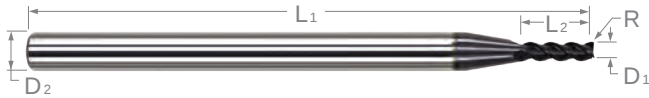
CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
D ₁								
$+0.0005"$ $-0.0005"$	$+0.00$ mm -0.02 mm	decimal equivalent	L_2 $+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.015 (1/64)		.0150	.023 (1.5x)	3	1/8	1-1/2	939815-C3	43.10
.015 (1/64)		.0150	.045 (3x)	3	1/8	1-1/2	945715-C3	43.10
	.5 mm	.0196	1.50 mm (3x)	3	4 mm	50 mm	952411-C3	42.10
.020		.0200	.060 (3x)	3	1/8	1-1/2	945720-C3	38.90
.025		.0250	.075 (3x)	3	1/8	1-1/2	945725-C3	37.50
.031 (1/32)		.0310	.047 (1.5x)	3	1/8	1-1/2	939831-C3	31.20
.031 (1/32)		.0310	.093 (3x)	3	1/8	1-1/2	945731-C3	31.20
.031 (1/32)		.0310	.156 (5x)	3	1/8	2-1/2	900531-C3	40.10
	1.0 mm	.0393	1.50 mm (1.5x)	3	4 mm	50 mm	926022-C3	34.90
	1.0 mm	.0393	3.00 mm (3x)	3	4 mm	50 mm	952422-C3	34.90
.040		.0400	.120 (3x)	3	1/8	1-1/2	945740-C3	32.20
.047 (3/64)		.0470	.071 (1.5x)	3	1/8	1-1/2	939847-C3	31.20
.047 (3/64)		.0470	.141 (3x)	3	1/8	1-1/2	945747-C3	31.20
	1.5 mm	.0590	4.50 mm (3x)	3	4 mm	50 mm	952433-C3	33.00
.062 (1/16)		.0620	.093 (1.5x)	3	1/8	1-1/2	939862-C3	29.20
.062 (1/16)		.0620	.186 (3x)	3	1/8	1-1/2	945762-C3	29.20
.062 (1/16)		.0620	.312 (5x)	3	1/8	2-1/2	900562-C3	38.30
.078 (5/64)		.0780	.118 (1.5x)	3	1/8	1-1/2	939878-C3	29.20
.078 (5/64)		.0780	.234 (3x)	3	1/8	1-1/2	945778-C3	29.20
	2.0 mm	.0787	6.00 mm (3x)	3	4 mm	50 mm	952445-C3	33.00
.093 (3/32)		.0930	.140 (1.5x)	3	1/8	1-1/2	939893-C3	29.20
.093 (3/32)		.0930	.279 (3x)	3	1/8	1-1/2	945793-C3	29.20
.093 (3/32)		.0930	.500 (5x)	3	1/8	2-1/2	900593-C3	38.30
	3.0 mm	.1181	4.50 mm (1.5x)	3	4 mm	50 mm	926057-C3	33.00
	3.0 mm	.1181	9.00 mm (3x)	3	4 mm	50 mm	952457-C3	33.00

D ₁			L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
$+0.000"$ $-0.002"$		decimal equivalent	$+0.030"$ $-0.000"$					
.125 (1/8)		.1250	.187 (1.5x)	4	1/8	1-1/2	939908-C3	27.60
.125 (1/8)		.1250	.375 (3x)	4	1/8	1-1/2	945808-C3	27.60
.125 (1/8)		.1250	.625 (5x)	4	1/8	2-1/2	900608-C3	38.10
.156 (5/32)		.1562	.235 (1.5x)	4	3/16	2	939910-C3	31.30
.156 (5/32)		.1562	.470 (3x)	4	3/16	2	945810-C3	31.30
.187 (3/16)		.1875	.285 (1.5x)	4	3/16	2	939912-C3	29.80
.187 (3/16)		.1875	.562 (3x)	4	3/16	2	945812-C3	29.80
.250 (1/4)		.2500	.375 (1.5x)	4	1/4	2-1/2	939916-C3	37.70
.250 (1/4)		.2500	.750 (3x)	4	1/4	2-1/2	945816-C3	37.70

PLEASE SEE SPEEDS & FEEDS ON PAGE 181

VARIABLE HELIX END MILLS FOR FREE MACHINING STEELS

Corner Radius



- Optimized for free machining varieties of carbon steels and stainless steels
- Variable helix design (approx. 38°) reduces chatter and harmonics and increases material removal rates
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

FREE MACHINING STEELS

mm & in

CUTTER DIAMETER		CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁		R	L ₂		D ₂ (h6)	L ₁	TOOL #	PRICE
$\begin{smallmatrix} +.0005" \\ -.0005" \end{smallmatrix}$	$\begin{smallmatrix} +.00mm \\ -.02mm \end{smallmatrix}$ decimal equivalent	$\begin{smallmatrix} +.001" \\ -.001" \\ +.25mm \\ -.25mm \end{smallmatrix}$	$\begin{smallmatrix} +.010" \\ -.000" \\ +.25mm \\ -.00mm \end{smallmatrix}$					
.015 (1/64)	.0150	.002	.023 (1.5x)	3	1/8	1-1/2	969415-C3	44.60
.015 (1/64)	.0150	.002	.045 (3x)	3	1/8	1-1/2	971215-C3	44.60
.015 (1/64)	.0150	.002	.078 (5x)	3	1/8	2-1/2	980315-C3	54.00
.015 (1/64)	.0150	.005	.045 (3x)	3	1/8	1-1/2	859815-C3	44.60
.020	.0200	.002	.060 (3x)	3	1/8	1-1/2	971220-C3	39.20
.020	.0200	.005	.060 (3x)	3	1/8	1-1/2	859820-C3	39.10
.025	.0250	.002	.075 (3x)	3	1/8	1-1/2	971225-C3	37.80
.025	.0250	.005	.075 (3x)	3	1/8	1-1/2	859825-C3	37.80
.031 (1/32)	.0310	.003	.047 (1.5x)	3	1/8	1-1/2	969431-C3	32.00
.031 (1/32)	.0310	.003	.093 (3x)	3	1/8	1-1/2	971231-C3	32.00
.031 (1/32)	.0310	.003	.156 (5x)	3	1/8	2-1/2	980331-C3	40.10
.031 (1/32)	.0310	.005	.093 (3x)	3	1/8	1-1/2	859831-C3	31.90
.031 (1/32)	.0310	.010	.093 (3x)	3	1/8	1-1/2	856631-C3	34.20
1.0 mm	.0393	.08 mm	3.00 mm (3x)	3	4 mm	50 mm	901822-C3	35.20
.040	.0400	.003	.120 (3x)	3	1/8	1-1/2	971240-C3	32.00
.040	.0400	.005	.120 (3x)	3	1/8	1-1/2	859840-C3	31.90
.047 (3/64)	.0470	.003	.071 (1.5x)	3	1/8	1-1/2	969447-C3	32.00
.047 (3/64)	.0470	.003	.141 (3x)	3	1/8	1-1/2	971247-C3	32.00
.047 (3/64)	.0470	.003	.250 (5x)	3	1/8	2-1/2	980347-C3	40.10
.047 (3/64)	.0470	.005	.141 (3x)	3	1/8	1-1/2	859847-C3	31.90
.047 (3/64)	.0470	.010	.141 (3x)	3	1/8	1-1/2	856647-C3	31.90
.047 (3/64)	.0470	.015	.141 (3x)	3	1/8	1-1/2	857447-C3	34.20
.050	.0500	.003	.150 (3x)	3	1/8	1-1/2	971250-C3	31.90
.050	.0500	.005	.150 (3x)	3	1/8	1-1/2	859850-C3	31.90
.060	.0600	.005	.180 (3x)	3	1/8	1-1/2	971260-C3	31.90
.060	.0600	.010	.180 (3x)	3	1/8	1-1/2	856660-C3	31.90
.062 (1/16)	.0620	.005	.093 (1.5x)	3	1/8	1-1/2	969462-C3	29.70
.062 (1/16)	.0620	.005	.186 (3x)	3	1/8	1-1/2	971262-C3	29.70
.062 (1/16)	.0620	.005	.312 (5x)	3	1/8	2-1/2	980362-C3	38.60
.062 (1/16)	.0620	.010	.186 (3x)	3	1/8	1-1/2	856662-C3	29.70
.062 (1/16)	.0620	.020	.186 (3x)	3	1/8	1-1/2	858262-C3	32.00
.078 (5/64)	.0780	.005	.118 (1.5x)	3	1/8	1-1/2	969478-C3	29.70
.078 (5/64)	.0780	.005	.234 (3x)	3	1/8	1-1/2	971278-C3	29.70
.078 (5/64)	.0780	.005	.406 (5x)	3	1/8	2-1/2	980378-C3	38.60
.078 (5/64)	.0780	.010	.234 (3x)	3	1/8	1-1/2	856678-C3	29.70
.078 (5/64)	.0780	.020	.234 (3x)	3	1/8	1-1/2	858278-C3	32.00

continued on next page

VARIABLE HELIX END MILLS FOR FREE MACHINING STEELS

Corner Radius (cont.)



continued from previous page

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent	R +.001" -.001" +.25mm -.25mm	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	TOOL #	PRICE
	2.0 mm	.0787	.10 mm	6.00 mm (3x)	3	4 mm	50 mm	901845-C3	33.30
.093 (3/32)		.0930	.005	.140 (1.5x)	3	1/8	1-1/2	969493-C3	29.70
.093 (3/32)		.0930	.005	.279 (3x)	3	1/8	1-1/2	971293-C3	29.70
.093 (3/32)		.0930	.005	.500 (5x)	3	1/8	2-1/2	980393-C3	38.60
.093 (3/32)		.0930	.010	.279 (3x)	3	1/8	1-1/2	856693-C3	29.70
.093 (3/32)		.0930	.030	.279 (3x)	3	1/8	1-1/2	859093-C3	32.00
.100		.1000	.005	.300 (3x)	3	1/8	1-1/2	971300-C3	29.70
	3.0 mm	.1181	.10 mm	9.00 mm (3x)	3	4 mm	50 mm	901857-C3	33.30

D ₁ +.000" -.002"	decimal equivalent	R +.001" -.001"	L ₂ +.030" -.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)	.1250	.005	.187 (1.5x)	4	1/8	1-1/2	969508-C3	28.00
.125 (1/8)	.1250	.005	.375 (3x)	4	1/8	1-1/2	971308-C3	28.00
.125 (1/8)	.1250	.005	.625 (5x)	4	1/8	2-1/2	980408-C3	38.60
.125 (1/8)	.1250	.010	.375 (3x)	4	1/8	1-1/2	856708-C3	29.70
.125 (1/8)	.1250	.030	.375 (3x)	4	1/8	1-1/2	859108-C3	32.00
.156 (5/32)	.1562	.010	.235 (1.5x)	4	3/16	2	969510-C3	32.20
.156 (5/32)	.1562	.010	.470 (3x)	4	3/16	2	971310-C3	32.20
.156 (5/32)	.1562	.010	.750 (5x)	4	3/16	3	980410-C3	41.70
.187 (3/16)	.1875	.010	.285 (1.5x)	4	3/16	2	969512-C3	30.40
.187 (3/16)	.1875	.010	.562 (3x)	4	3/16	2	971312-C3	30.40
.187 (3/16)	.1875	.010	1.000 (5x)	4	3/16	3	980412-C3	41.70
.250 (1/4)	.2500	.010	.375 (1.5x)	4	1/4	2-1/2	969516-C3	38.30
.250 (1/4)	.2500	.010	.750 (3x)	4	1/4	2-1/2	971316-C3	38.30
.250 (1/4)	.2500	.010	1.250 (5x)	4	1/4	4	980416-C3	51.80
.312 (5/16)	.3125	.010	.470 (1.5x)	4	5/16	2-1/2	969520-C3	56.30
.312 (5/16)	.3125	.010	1.000 (3x)	4	5/16	2-1/2	971320-C3	56.30
.375 (3/8)	.3750	.010	.570 (1.5x)	4	3/8	2-1/2	969524-C3	65.40
.375 (3/8)	.3750	.010	1.125 (3x)	4	3/8	2-1/2	971324-C3	65.40
.500 (1/2)	.5000	.015	.750 (1.5x)	4	1/2	3	969532-C3	84.60

PLEASE SEE SPEEDS & FEEDS ON PAGE 181



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VARIABLE HELIX END MILLS FOR FREE MACHINING STEELS

Finishers – Square



- Optimized for free machining varieties of carbon steels and stainless steels
- Variable helix design (approx. 47°) reduces chatter and harmonics, improving finish
- High helix for effective chip evacuation
- h6 shank tolerance for high precision tool holders
- End cutting (not center cutting)
- Solid carbide
- CNC ground in the USA

FREE MACHINING STEELS



CUTTER DIAMETER	LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
					TOOL #	PRICE
D ₁ +.0005" - .0005" +.00mm - .02mm decimal equivalent	L ₂ +.010" - .000" +.25mm - .00mm		D ₂ (h6)	L ₁		
.015 (1/64)	.0150	.045 (3x)	4	1/8	1-1/2	967815-C3 43.40
.015 (1/64)	.0150	.078 (5x)	4	1/8	2-1/2	972415-C3 53.90
.015 (1/64)	.0150	.125 (8x)	4	1/8	2-1/2	983615-C3 54.60
.020	.0200	.060 (3x)	4	1/8	1-1/2	967820-C3 42.70
.020	.0200	.100 (5x)	4	1/8	2-1/2	972420-C3 53.50
.025	.0250	.075 (3x)	4	1/8	1-1/2	967825-C3 40.10
.025	.0250	.125 (5x)	4	1/8	2-1/2	972425-C3 51.80
.031 (1/32)	.0310	.047 (1.5x)	5	1/8	1-1/2	935131-C3 35.70
.031 (1/32)	.0310	.093 (3x)	5	1/8	1-1/2	967831-C3 35.70
.031 (1/32)	.0310	.156 (5x)	5	1/8	2-1/2	972431-C3 49.80
.031 (1/32)	.0310	.250 (8x)	5	1/8	2-1/2	983631-C3 50.70
1.0 mm	.0393	3.00 mm (3x)	5	4 mm	50 mm	921922-C3 40.90
1.0 mm	.0393	5.00 mm (5x)	5	4 mm	50 mm	916422-C3 51.00
.040	.0400	.120 (3x)	5	1/8	1-1/2	967840-C3 36.40
.040	.0400	.203 (5x)	5	1/8	2-1/2	972440-C3 50.40
.047 (3/64)	.0470	.141 (3x)	5	1/8	1-1/2	967847-C3 35.70
.047 (3/64)	.0470	.250 (5x)	5	1/8	2-1/2	972447-C3 49.80
.047 (3/64)	.0470	.375 (8x)	5	1/8	2-1/2	983647-C3 50.70
.050	.0500	.150 (3x)	5	1/8	1-1/2	967850-C3 36.40
.050	.0500	.250 (5x)	5	1/8	2-1/2	972450-C3 50.40
.060	.0600	.180 (3x)	5	1/8	1-1/2	967860-C3 36.40
.060	.0600	.312 (5x)	5	1/8	2-1/2	972460-C3 50.40
.062 (1/16)	.0620	.093 (1.5x)	5	1/8	1-1/2	935162-C3 33.60
.062 (1/16)	.0620	.186 (3x)	5	1/8	1-1/2	967862-C3 33.60
.062 (1/16)	.0620	.312 (5x)	5	1/8	2-1/2	972462-C3 46.90
.062 (1/16)	.0620	.500 (8x)	5	1/8	2-1/2	983662-C3 47.60
.078 (5/64)	.0780	.234 (3x)	5	1/8	1-1/2	967878-C3 33.60
.078 (5/64)	.0780	.406 (5x)	5	1/8	2-1/2	972478-C3 46.90
.078 (5/64)	.0780	.625 (8x)	5	1/8	2-1/2	983678-C3 47.60
2.0 mm	.0787	6.00 mm (3x)	5	4 mm	50 mm	921945-C3 39.50
2.0 mm	.0787	10.00 mm (5x)	5	4 mm	50 mm	916445-C3 49.50

continued on next page

VARIABLE HELIX END MILLS FOR FREE MACHINING STEELS

Finishers – Square (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	AISI IN COATED	
D ₁ +.0005" -.0005" +.00 mm -.02 mm decimal equivalent			L ₂ +.010" -.000" +.25 mm -.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE
.093 (3/32)			.0930	.140 (1.5x)	5	1/8	1-1/2	935193-C3 33.60
.093 (3/32)			.0930	.279 (3x)	5	1/8	1-1/2	967893-C3 33.60
.093 (3/32)			.0930	.500 (5x)	5	1/8	2-1/2	972493-C3 46.90
.093 (3/32)			.0930	.750 (8x)	5	1/8	2-1/2	983693-C3 47.60
.100			.1000	.300 (3x)	5	1/8	1-1/2	967900-C3 34.10
.100			.1000	.500 (5x)	5	1/8	2-1/2	972500-C3 46.90
3.0 mm			.1181	9.00 mm (3x)	5	4 mm	50 mm	921957-C3 39.50
3.0 mm			.1181	15.00 mm (5x)	5	4 mm	50 mm	916457-C3 49.50

D ₁ +.000" -.002" decimal equivalent	L ₂ +.030" -.000"		D ₂ (h6)	L ₁	TOOL #	PRICE
.125 (1/8)	.1250	.187 (1.5x)	5	1/8	1-1/2	935208-C3 31.90
.125 (1/8)	.1250	.375 (3x)	5	1/8	1-1/2	967908-C3 31.90
.125 (1/8)	.1250	.625 (5x)	5	1/8	2-1/2	972508-C3 45.80
.125 (1/8)	.1250	1.000 (8x)	5	1/8	2-1/2	983708-C3 46.90
.156 (5/32)	.1562	.470 (3x)	5	3/16	2	967910-C3 36.40
.156 (5/32)	.1562	.750 (5x)	5	3/16	3	972510-C3 48.80
.187 (3/16)	.1875	.570 (3x)	5	3/16	2	967912-C3 36.40
.187 (3/16)	.1875	1.000 (5x)	5	3/16	3	972512-C3 48.80
.187 (3/16)	.1875	1.500 (8x)	5	3/16	3	983712-C3 49.60
.250 (1/4)	.2500	.750 (3x)	5	1/4	2-1/2	967916-C3 46.20
.250 (1/4)	.2500	1.250 (5x)	5	1/4	4	972516-C3 59.60
.250 (1/4)	.2500	2.000 (8x)	5	1/4	4	983716-C3 60.70

FREE MACHINING STEELS

SPEEDS & FEEDS (High-Helix Finishers for Free Machining Steels)

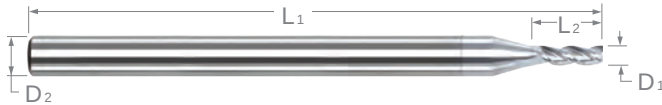
Material	Hardness (HBN)	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter										Depth of Cut	
			.015	.031	.047	.062	.078	.093	.125	.187	.250		Radial	Axial
Carbon Steels: 10xx - 1030 & all 10Lxx, 11xx - 1140 & all 11Lxx, 12xx - 1215 & all 12Lxx	100 - 125	500	Finishing (1.5x LOC)	.00025	.00051	.00078	.00102	.00129	.00153	.00206	.00309	.00413	< .10x Dia	.5x - 1.5x Dia
	125 - 150	425	Finishing (3x LOC)	.00023	.00047	.00071	.00093	.00117	.00140	.00188	.00281	.00375	< .10x Dia	.5x - 3x Dia
	150 - 175	400												
Stainless Steels: 203 EZ, 303 (all types), 416, 416 Se, 416 Plus X, 420 F, 420 F Se, 440 F, 440 F Se	175 - 200	375	Finishing (5x LOC)	.00017	.00035	.00053	.00070	.00088	.00105	.00141	.00210	.00281	< .07x Dia	.5x - 5x Dia
	200 - 225	350	Finishing (8x LOC)	.00012	.00026	.00039	.00051	.00064	.00077	.00103	.00154	.00206	< .05x Dia	.5x - 8x Dia



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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Square



- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
- Variable helix design (approx. 42°) reduces chatter and harmonics, and increases material removal rates
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

NEW

NEW

NEW

CUTTER DIAMETER	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
					TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
D ₁ + .0005" / + .00 mm / decimal - .0005" / - .02 mm / equivalent	L ₂ + .010" / + .25 mm - .000" / - .00 mm		D ₂ (h6)	L ₁						
.010	.0100	.015 (1.5x)	3	1/8	1-1/2	968710	48.70	968710-C8	55.90	
.010	.0100	.030 (3x)	3	1/8	1-1/2	942210	48.70	942210-C8	55.90	
.015 (1/64)	.0150	.023 (1.5x)	3	1/8	1-1/2	968715	39.20	968715-C8	46.40	
.015 (1/64)	.0150	.045 (3x)	3	1/8	1-1/2	942215	39.20	942215-C8	46.40	942215-C4 51.60
.015 (1/64)	.0150	.078 (5x)	3	1/8	2-1/2	923015	49.60	923015-C8	56.80	
0.5 mm	.0196	1.50 mm (3x)	3	4 mm	50 mm	900411	39.10	900411-C8	46.60	
.020	.0200	.030 (1.5x)	3	1/8	1-1/2	968720	34.60	968720-C8	41.10	968720-C4 47.00
.020	.0200	.060 (3x)	3	1/8	1-1/2	942220	34.60	942220-C8	41.10	942220-C4 47.00
.020	.0200	.100 (5x)	3	1/8	2-1/2	923020	44.80	923020-C8	51.30	
.025	.0250	.038 (1.5x)	3	1/8	1-1/2	968725	34.60	968725-C8	41.10	
.025	.0250	.075 (3x)	3	1/8	1-1/2	942225	34.60	942225-C8	41.10	942225-C4 47.00
.025	.0250	.125 (5x)	3	1/8	2-1/2	923025	44.80	923025-C8	51.30	
.030	.0300	.045 (1.5x)	3	1/8	1-1/2	968730	34.60	968730-C8	41.10	
.030	.0300	.090 (3x)	3	1/8	1-1/2	942230	34.60	942230-C8	41.10	942230-C4 47.00
.030	.0300	.156 (5x)	3	1/8	2-1/2	923030	44.80	923030-C8	51.30	
.031 (1/32)	.0310	.025 (.8x)	3	1/8	1-1/2	873531	30.40	873531-C8	37.60	
.031 (1/32)	.0310	.047 (1.5x)	3	1/8	1-1/2	968731	27.50	968731-C8	33.90	968731-C4 39.90
.031 (1/32)	.0310	.093 (3x)	2	1/8	1-1/2	792131	27.50	792131-C8	34.70	
.031 (1/32)	.0310	.093 (3x)	3	1/8	1-1/2	942231	27.50	942231-C8	33.90	942231-C4 39.90
.031 (1/32)	.0310	.125 (4x)	3	1/8	2-1/2	857231	37.80	857231-C8	45.00	
.031 (1/32)	.0310	.156 (5x)	3	1/8	2-1/2	923031	37.80	923031-C8	44.30	923031-C4 50.20
.031 (1/32)	.0310	.250 (8x)	3	1/8	2-1/2	746031	40.70	746031-C8	47.90	
0.8 mm	.0314	2.40 mm (3x)	3	4 mm	50 mm	900418	30.20	900418-C8	37.70	
.035	.0350	.105 (3x)	3	1/8	1-1/2	942235	32.10	942235-C8	39.30	
1.0 mm	.0393	1.50 mm (1.5x)	3	4 mm	50 mm	858422	30.20	858422-C8	37.70	
1.0 mm	.0393	3.00 mm (3x)	3	4 mm	50 mm	900422	30.20	900422-C8	36.40	900422-C4 47.30
1.0 mm	.0393	5.00 mm (5x)	3	4 mm	50 mm	845922	32.00	845922-C8	39.50	
.040	.0400	.060 (1.5x)	3	1/8	1-1/2	968740	27.70	968740-C8	33.90	
.040	.0400	.120 (3x)	3	1/8	1-1/2	942240	27.70	942240-C8	33.90	942240-C4 39.50
.040	.0400	.160 (4x)	3	1/8	2-1/2	857240	37.80	857240-C8	45.00	
.040	.0400	.203 (5x)	3	1/8	2-1/2	923040	37.80	923040-C8	44.30	923040-C4 50.20
.045	.0450	.135 (3x)	3	1/8	1-1/2	942245	27.70	942245-C8	34.90	
.047 (3/64)	.0470	.071 (1.5x)	3	1/8	1-1/2	968747	27.50	968747-C8	33.90	968747-C4 39.90
.047 (3/64)	.0470	.141 (3x)	2	1/8	1-1/2	792147	27.50	792147-C8	34.70	
.047 (3/64)	.0470	.141 (3x)	3	1/8	1-1/2	942247	27.50	942247-C8	33.90	942247-C4 39.90
.047 (3/64)	.0470	.187 (4x)	3	1/8	2-1/2	857247	37.80	857247-C8	45.00	
.047 (3/64)	.0470	.250 (5x)	3	1/8	2-1/2	923047	37.80	923047-C8	44.30	923047-C4 50.20

continued on next page

ALUMINUM ALLOYS

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Square (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁ +.0005" -.0005"	+.00 mm -.02 mm	decimal equivalent	L ₂ +.010" -.000" +.25 mm -.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
.050		.0500	.075 (1.5x)	3	1/8	1-1/2	968750	27.70	968750-C8	33.90		
.050		.0500	.150 (3x)	3	1/8	1-1/2	942250	27.70	942250-C8	33.90	942250-C4	39.50
.050		.0500	.250 (5x)	3	1/8	2-1/2	923050	37.80	923050-C8	44.30		
.055		.0550	.083 (1.5x)	3	1/8	1-1/2	968755	27.70	968755-C8	34.90		
.055		.0550	.165 (3x)	3	1/8	1-1/2	942255	27.70	942255-C8	34.90	942255-C4	40.10
.055		.0550	.275 (5x)	3	1/8	2-1/2	923055	37.80	923055-C8	45.00		
1.5 mm	.0590		4.50 mm (3x)	3	4 mm	50 mm	900433	32.00	900433-C8	39.50		
.060		.0600	.090 (1.5x)	3	1/8	1-1/2	968760	25.70	968760-C8	32.90		
.060		.0600	.180 (3x)	3	1/8	1-1/2	942260	27.70	942260-C8	33.90	942260-C4	39.50
.060		.0600	.250 (4x)	3	1/8	2-1/2	857260	37.80	857260-C8	45.00		
.060		.0600	.312 (5x)	3	1/8	2-1/2	923060	37.80	923060-C8	44.30		
.062 (1/16)		.0620	.050 (.8x)	3	1/8	1-1/2	873562	27.50	873562-C8	34.70		
.062 (1/16)		.0620	.093 (1.5x)	3	1/8	1-1/2	968762	25.60	968762-C8	31.70	968762-C4	37.30
.062 (1/16)		.0620	.186 (3x)	2	1/8	1-1/2	792162	25.60	792162-C8	32.80		
.062 (1/16)		.0620	.186 (3x)	3	1/8	1-1/2	942262	25.60	942262-C8	31.70	942262-C4	37.30
.062 (1/16)		.0620	.250 (4x)	3	1/8	2-1/2	857262	35.70	857262-C8	42.90	857262-C4	48.10
.062 (1/16)		.0620	.312 (5x)	3	1/8	2-1/2	923062	35.70	923062-C8	42.00	923062-C4	48.10
.062 (1/16)		.0620	.500 (8x)	3	1/8	2-1/2	746062	38.60	746062-C8	45.80		
.070		.0700	.105 (1.5x)	3	1/8	1-1/2	968770	25.70	968770-C8	32.90		
.070		.0700	.210 (3x)	3	1/8	1-1/2	942270	25.70	942270-C8	31.70	942270-C4	37.30
.070		.0700	.375 (5x)	3	1/8	2-1/2	923070	35.70	923070-C8	42.00		
.075		.0750	.225 (3x)	3	1/8	1-1/2	942275	25.70	942275-C8	32.90		
.078 (5/64)		.0780	.117 (1.5x)	3	1/8	1-1/2	968778	25.60	968778-C8	31.70	968778-C4	37.30
.078 (5/64)		.0780	.234 (3x)	2	1/8	1-1/2	792178	25.60	792178-C8	32.80		
.078 (5/64)		.0780	.234 (3x)	3	1/8	1-1/2	942278	25.60	942278-C8	31.70	942278-C4	37.30
.078 (5/64)		.0780	.312 (4x)	3	1/8	2-1/2	857278	35.70	857278-C8	42.90		
.078 (5/64)		.0780	.406 (5x)	3	1/8	2-1/2	923078	35.70	923078-C8	42.00	923078-C4	48.10
2.0 mm	.0787		3.00 mm (1.5x)	3	4 mm	50 mm	858445	28.20	858445-C8	35.70		
2.0 mm	.0787		6.00 mm (3x)	3	4 mm	50 mm	900445	28.20	900445-C8	34.30	900445-C4	45.30
2.0 mm	.0787		10.00 mm (5x)	3	4 mm	50 mm	845945	30.00	845945-C8	37.50		
.080		.0800	.120 (1.5x)	3	1/8	1-1/2	968780	25.70	968780-C8	32.90		
.080		.0800	.240 (3x)	3	1/8	1-1/2	942280	25.70	942280-C8	31.70	942280-C4	37.30
.080		.0800	.406 (5x)	3	1/8	2-1/2	923080	35.70	923080-C8	42.00		
.090		.0900	.135 (1.5x)	3	1/8	1-1/2	968790	25.70	968790-C8	32.90		
.090		.0900	.270 (3x)	3	1/8	1-1/2	942290	25.70	942290-C8	31.70	942290-C4	37.30
.090		.0900	.450 (5x)	3	1/8	2-1/2	923090	35.70	923090-C8	42.00		
.093 (3/32)		.0930	.074 (.8x)	3	1/8	1-1/2	873593	27.50	873593-C8	34.70		
.093 (3/32)		.0930	.140 (1.5x)	3	1/8	1-1/2	968793	25.60	968793-C8	31.70	968793-C4	37.30
.093 (3/32)		.0930	.279 (3x)	2	1/8	1-1/2	792193	25.60	792193-C8	32.80		
.093 (3/32)		.0930	.279 (3x)	3	1/8	1-1/2	942293	25.60	942293-C8	31.70	942293-C4	37.30
.093 (3/32)		.0930	.375 (4x)	3	1/8	2-1/2	857293	35.70	857293-C8	42.90	857293-C4	48.10
.093 (3/32)		.0930	.500 (5x)	3	1/8	2-1/2	923093	35.70	923093-C8	42.00	923093-C4	48.10
.093 (3/32)		.0930	.750 (8x)	3	1/8	2-1/2	746093	38.60	746093-C8	45.80		
2.5 mm	.0984		7.50 mm (3x)	3	4 mm	50 mm	900451	30.00	900451-C8	37.50		

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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁							TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
+ .0005" / - .0005"	+ .00mm / - .02mm	decimal equivalent	L ₂ + .010" / - .000" / + .25mm / - .00mm		D ₂ (h6)	L ₁						
.100		.1000	.150 (1.5x)	3	1/8	1-1/2	968800	25.70	968800-C8	31.70		
.100		.1000	.300 (3x)	3	1/8	1-1/2	942300	25.70	942300-C8	31.70	942300-C4	37.30
.100		.1000	.500 (5x)	3	1/8	2-1/2	923100	35.70	923100-C8	42.00		
.109 (7/64)		.1090	.164 (1.5x)	3	1/8	1-1/2	968802	25.70	968802-C8	31.70		
.109 (7/64)		.1090	.327 (3x)	3	1/8	1-1/2	942302	25.70	942302-C8	31.70	942302-C4	37.30
.109 (7/64)		.1090	.570 (5x)	3	1/8	2-1/2	923102	35.70	923102-C8	42.00		
3.0 mm	.1181		4.50 mm (1.5x)	3	4 mm	50mm	858457	28.50	858457-C8	36.00		
3.0 mm	.1181		9.00 mm (3x)	3	4 mm	50 mm	900457	28.20	900457-C8	34.30	900457-C4	45.30
3.0 mm	.1181		12.00 mm (4x)	3	4 mm	50 mm	770057	30.00	770057-C8	37.50		
3.0 mm	.1181		15.00 mm (5x)	3	4 mm	50 mm	845957	31.70	845957-C8	39.20		

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁							TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
+ .000" / - .002"	+ .00mm / - .04mm	decimal equivalent	L ₂ + .030" / - .000" / + .75mm / - .00mm		D ₂ (h6)	L ₁						
.125 (1/8)		.1250	.100 (.8x)	3	1/8	1-1/2	873608	28.30	873608-C8	35.50		
.125 (1/8)		.1250	.187 (1.5x)	3	1/8	1-1/2	968808	24.20	968808-C8	31.40	968808-C4	36.60
.125 (1/8)		.1250	.375 (3x)	2	1/8	1-1/2	792208	24.20	792208-C8	31.40		
.125 (1/8)		.1250	.375 (3x)	3	1/8	1-1/2	942308	24.20	942308-C8	31.40	942308-C4	36.60
.125 (1/8)		.1250	.500 (4x)	3	1/8	2-1/2	857308	35.40	857308-C8	42.60	857308-C4	47.80
.125 (1/8)		.1250	.625 (5x)	3	1/8	2-1/2	923108	35.40	923108-C8	42.00	923108-C4	47.80
NEW .125 (1/8)		.1250	1.000 (8x)	3	1/8	2-1/2	746108	38.30	746108-C8	45.50		
NEW .140 (9/64)		.1406	.220 (1.5x)	3	3/16	2	968809	26.40	968809-C8	33.60		
.140 (9/64)		.1406	.425 (3x)	3	3/16	2	942309	26.40	942309-C8	33.60		
.140 (9/64)		.1406	.750 (5x)	3	3/16	3	923109	36.70	923109-C8	43.90		
.156 (5/32)		.1562	.235 (1.5x)	3	3/16	2	968810	26.60	968810-C8	33.80	968810-C4	43.70
.156 (5/32)		.1562	.469 (3x)	3	3/16	2	942310	26.60	942310-C8	33.80	942310-C4	43.70
.156 (5/32)		.1562	.750 (5x)	3	3/16	3	923110	36.70	923110-C8	43.90	923110-C4	53.80
NEW 4.0 mm	.1574		12.00 mm (3x)	3	6 mm	63 mm	900461	38.90	900461-C8	46.60		
.187 (3/16)		.1875	.150 (.8x)	3	3/16	2	873612	29.50	873612-C8	36.70		
.187 (3/16)		.1875	.285 (1.5x)	3	3/16	2	968812	26.00	968812-C8	33.20	968812-C4	43.10
.187 (3/16)		.1875	.562 (3x)	2	3/16	2	792212	26.00	792212-C8	33.20		
.187 (3/16)		.1875	.562 (3x)	3	3/16	2	942312	26.00	942312-C8	33.20	942312-C4	43.10
.187 (3/16)		.1875	.750 (4x)	3	3/16	3	857312	29.70	857312-C8	36.90		
.187 (3/16)		.1875	1.000 (5x)	3	3/16	3	923112	36.70	923112-C8	43.90	923112-C4	53.80
NEW 5.0 mm	.1968		15.00 mm (3x)	3	6 mm	63 mm	900464	38.90	900464-C8	46.60		
.218 (7/32)		.2187	.625 (3x)	3	1/4	2-1/2	942314	38.00	942314-C8	45.70		
6.0 mm	.2362		18.00 mm (3x)	3	6 mm	63 mm	900466	38.90	900466-C8	46.60		
.250 (1/4)		.2500	.200 (.8x)	3	1/4	2-1/2	873616	36.70	873616-C8	44.40		
.250 (1/4)		.2500	.375 (1.5x)	3	1/4	2-1/2	968816	31.40	968816-C8	39.10	968816-C4	50.80
.250 (1/4)		.2500	.750 (3x)	3	1/4	2-1/2	942316	31.40	942316-C8	39.10	942316-C4	50.80
.250 (1/4)		.2500	1.000 (4x)	3	1/4	4	857316	35.10	857316-C8	43.80		
.250 (1/4)		.2500	1.250 (5x)	3	1/4	4	923116	43.50	923116-C8	52.20	923116-C4	62.90

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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁ +.000" -.002"	+.00mm -.04mm	decimal equivalent					TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
.312 (5/16)	.3125		1.000 (3x)	3	5/16	2-1/2	942320	39.40	942320-C8	55.80		
.375 (3/8)	.3750		.570 (1.5x)	3	3/8	2-1/2	968824	42.80	968824-C8	62.70		
.375 (3/8)	.3750		1.125 (3x)	3	3/8	2-1/2	942324	42.80	942324-C8	62.70	942324-C4	66.20
.375 (3/8)	.3750		2.000 (5x)	3	3/8	4	923124	47.20	923124-C8	70.60		NEW
.500 (1/2)	.5000		.750 (1.5x)	3	1/2	3	968832	45.30	968832-C8	68.70		
.500 (1/2)	.5000		1.500 (3x)	3	1/2	3	942332	45.30	942332-C8	68.70	942332-C4	73.50
.500 (1/2)	.5000		2.625 (5x)	3	1/2	4	923132	49.50	923132-C8	70.90		NEW

PLEASE SEE SPEEDS & FEEDS ON PAGE 202

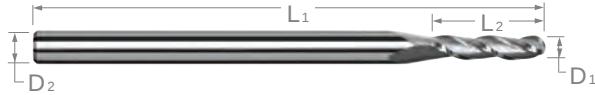
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- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
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- h6 shank tolerance for high precision tool holders 3 flutes
- Center cutting Solid carbide
- CNC ground in the USA 

ALUMINUM ALLOYS

CUTTER DIAMETER			LENGTH OF CUT		FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁			L ₂			D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+ .0005" / - .0005" / decimal equivalent			+ .010" / - .000" / + .25mm / - .00mm										
.2 mm	.0078		.60 mm	(3x)	3	4 mm	50 mm	977504	56.90	977504-C8	64.40		
.010	.0100		.015	(1.5x)	3	1/8	1-1/2	958110	58.00	958110-C8	65.20		
.010	.0100		.030	(3x)	3	1/8	1-1/2	989710	58.00	989710-C8	65.20		
.015 (1/64)	.0150		.023	(1.5x)	3	1/8	1-1/2	958115	46.90	958115-C8	54.10		
.015 (1/64)	.0150		.045	(3x)	3	1/8	1-1/2	989715	46.90	989715-C8	54.10		
.4 mm	.0157		1.20 mm	(3x)	3	4 mm	50 mm	977509	46.00	977509-C8	53.50		
.5 mm	.0196		1.50 mm	(3x)	3	4 mm	50 mm	977511	41.20	977511-C8	48.70		
.020	.0200		.030	(1.5x)	3	1/8	1-1/2	958120	41.00	958120-C8	48.20		
.020	.0200		.060	(3x)	3	1/8	1-1/2	989720	41.00	989720-C8	48.20		
.020	.0200		.100	(5x)	3	1/8	2-1/2	850020	41.60	850020-C8	48.80		
.6 mm	.0236		1.80 mm	(3x)	3	4 mm	50 mm	977513	39.10	977513-C8	46.60		
.025	.0250		.075	(3x)	3	1/8	1-1/2	989725	39.50	989725-C8	46.70		
.030	.0300		.090	(3x)	3	1/8	1-1/2	989730	34.70	989730-C8	41.90		
.031 (1/32)	.0310		.047	(1.5x)	3	1/8	1-1/2	958131	34.30	958131-C8	41.50		
.031 (1/32)	.0310		.093	(3x)	3	1/8	1-1/2	989731	33.90	989731-C8	41.10	989731-C4	46.30
.031 (1/32)	.0310		.156	(5x)	3	1/8	2-1/2	850031	42.10	850031-C8	49.30		
.8 mm	.0314		2.40 mm	(3x)	3	4 mm	50 mm	977518	33.60	977518-C8	41.10		
1.0 mm	.0393		1.50 mm	(1.5x)	3	4 mm	50 mm	908322	33.60	908322-C8	41.10		
1.0 mm	.0393		3.00 mm	(3x)	3	4 mm	50 mm	977522	33.60	977522-C8	41.10		
.040	.0400		.060	(1.5x)	3	1/8	1-1/2	958140	36.60	958140-C8	43.80		
.040	.0400		.120	(3x)	3	1/8	1-1/2	989740	36.20	989740-C8	43.40		
.047 (3/64)	.0470		.071	(1.5x)	3	1/8	1-1/2	958147	34.30	958147-C8	41.50		
.047 (3/64)	.0470		.141	(3x)	3	1/8	1-1/2	989747	33.90	989747-C8	41.10		
.047 (3/64)	.0470		.250	(5x)	3	1/8	2-1/2	850047	42.10	850047-C8	49.30		
1.2 mm	.0472		3.50 mm	(3x)	3	4 mm	50 mm	977527	33.60	977527-C8	41.10		
.050	.0500		.150	(3x)	3	1/8	1-1/2	989750	34.90	989750-C8	42.10		
1.4 mm	.0551		4.00 mm	(3x)	3	4 mm	50 mm	977531	33.60	977531-C8	41.10		
1.5 mm	.0590		4.50 mm	(3x)	3	4 mm	50 mm	977533	31.50	977533-C8	39.00		
.060	.0600		.180	(3x)	3	1/8	1-1/2	989760	34.10	989760-C8	41.30		
.062 (1/16)	.0620		.093	(1.5x)	3	1/8	1-1/2	958162	32.10	958162-C8	39.30		
.062 (1/16)	.0620		.186	(3x)	3	1/8	1-1/2	989762	32.10	989762-C8	39.30	989762-C4	44.50
.062 (1/16)	.0620		.250	(4x)	3	1/8	2-1/2	791162	40.10	791162-C8	47.30		
.062 (1/16)	.0620		.312	(5x)	3	1/8	2-1/2	850062	40.10	850062-C8	47.30		
1.6 mm	.0629		5.00 mm	(3x)	3	4 mm	50 mm	977536	31.50	977536-C8	39.00		
1.8 mm	.0708		5.50 mm	(3x)	3	4 mm	50 mm	977540	31.50	977540-C8	39.00		

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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

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CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁ +.0005" -.0005"	+.00mm -.02mm	decimal equivalent	L ₂ +.010" -.000" +.25mm -.00mm		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
.078 (5/64)		.0780	.118 (1.5x)	3	1/8	1-1/2	958178	32.10	958178-C8	39.30		
.078 (5/64)		.0780	.234 (3x)	3	1/8	1-1/2	989778	32.10	989778-C8	39.30		
.078 (5/64)		.0780	.406 (5x)	3	1/8	2-1/2	850078	40.10	850078-C8	47.30		
2.0 mm	.0787		3.00 mm (1.5x)	3	4 mm	50 mm	908345	31.50	908345-C8	39.00		
2.0 mm	.0787		6.00 mm (3x)	3	4 mm	50 mm	977545	31.50	977545-C8	39.00		
.093 (3/32)		.0930	.140 (1.5x)	3	1/8	1-1/2	958193	32.10	958193-C8	39.30		
.093 (3/32)		.0930	.279 (3x)	3	1/8	1-1/2	989793	32.10	989793-C8	39.30	989793-C4	44.50
.093 (3/32)		.0930	.500 (5x)	3	1/8	2-1/2	850093	40.10	850093-C8	47.30		
.100		.1000	.300 (3x)	3	1/8	1-1/2	989800	32.20	989800-C8	39.40		
.109 (7/64)		.1094	.327 (3x)	3	1/8	1-1/2	989802	33.00	989802-C8	39.50		
3.0 mm	.1181		9.00 mm (3x)	3	4 mm	50 mm	977557	32.40	977557-C8	39.90		
D ₁ +.000" -.002"		decimal equivalent	L ₂ +.030" -.000"		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
.125 (1/8)		.1250	.187 (1.5x)	3	1/8	1-1/2	958208	30.40	958208-C8	37.60		
.125 (1/8)		.1250	.375 (3x)	3	1/8	1-1/2	989808	30.40	989808-C8	37.60	989808-C4	42.80
.125 (1/8)		.1250	.500 (4x)	3	1/8	2-1/2	791208	40.10	791208-C8	47.30		
.125 (1/8)		.1250	.625 (5x)	3	1/8	2-1/2	850108	40.10	850108-C8	47.30		
.156 (5/32)		.1562	.235 (1.5x)	3	3/16	2	958210	33.10	958210-C8	40.30		
.156 (5/32)		.1562	.470 (3x)	3	3/16	2	989810	33.10	989810-C8	40.30		
.187 (3/16)		.1875	.285 (1.5x)	3	3/16	2	958212	31.40	958212-C8	38.60		
.187 (3/16)		.1875	.562 (3x)	3	3/16	2	989812	31.40	989812-C8	38.60	989812-C4	48.50
.187 (3/16)		.1875	1.000 (5x)	3	3/16	3	850112	32.30	850112-C8	39.50		
.250 (1/4)		.2500	.375 (1.5x)	3	1/4	2-1/2	958216	37.40	958216-C8	45.10		
.250 (1/4)		.2500	.750 (3x)	3	1/4	2-1/2	989816	37.40	989816-C8	45.10	989816-C4	56.80
.250 (1/4)		.2500	1.250 (5x)	3	1/4	4	850116	48.90	850116-C8	57.60		
.375 (3/8)		.3750	.570 (1.5x)	3	3/8	2-1/2	958224	49.10	958224-C8	69.00		
.375 (3/8)		.3750	1.125 (3x)	3	3/8	2-1/2	989824	49.10	989824-C8	69.00		
.500 (1/2)		.5000	.750 (1.5x)	3	1/2	3	958232	51.60	958232-C8	75.00		
.500 (1/2)		.5000	1.500 (3x)	3	1/2	3	989832	51.60	989832-C8	75.00		

ALUMINUM ALLOYS

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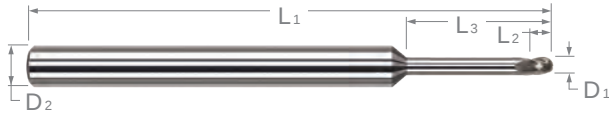


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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Ball – Long Reach, Stub Flute



- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
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- Reduced neck diameter to avoid heeling
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- h6 shank tolerance for high precision tool holders
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- Center cutting
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ALUMINUM ALLOYS

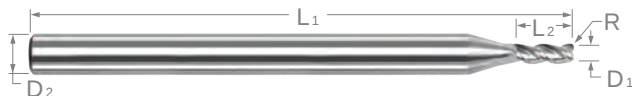
CUTTER DIAMETER			LENGTH OF CUT		OVERALL REACH		SHANK DIA		OAL		UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁			L ₂		L ₃		D ₂ (h6)	L ₁			3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+ .0005" / - .0005"	+ .00 mm / - .02 mm	decimal equivalent	+ .010" / - .000" / + .25 mm / - .00 mm		+ .010" / - .000" / + .25 mm / - .00 mm											
.015 (1/64)	.0150	.0150	.022	.078 (5x)	3	1/8	2-1/2	947015	51.30	947015-C8	58.50					
.015 (1/64)	.0150	.0150	.022	.125 (8x)	3	1/8	2-1/2	54415	59.60	54415-C8	66.80					
.020	.0200	.0200	.030	.100 (5x)	3	1/8	2-1/2	947020	55.20	947020-C8	62.40					
.020	.0200	.0200	.030	.160 (8x)	3	1/8	2-1/2	54420	56.20	54420-C8	63.40					
.025	.0250	.0250	.037	.125 (5x)	3	1/8	2-1/2	947025	53.70	947025-C8	60.90					
.025	.0250	.0250	.037	.203 (8x)	3	1/8	2-1/2	54425	55.00	54425-C8	62.20					
.031 (1/32)	.0310	.0310	.046	.156 (5x)	3	1/8	2-1/2	947031	50.70	947031-C8	57.90					
.031 (1/32)	.0310	.0310	.046	.250 (8x)	3	1/8	2-1/2	54431	53.40	54431-C8	60.60	54431-C4	65.80			
.031 (1/32)	.0310	.0310	.046	.312 (10x)	3	1/8	2-1/2	925131	56.60	925131-C8	63.80					
.031 (1/32)	.0310	.0310	.046	.375 (12x)	3	1/8	2-1/2	879431	58.50	879431-C8	65.70					
1.0 mm	.0393	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	851322	56.90	851322-C8	64.40						
.047 (3/64)	.0470	.0470	.070	.250 (5x)	3	1/8	2-1/2	947047	50.70	947047-C8	57.90					
.047 (3/64)	.0470	.0470	.070	.375 (8x)	3	1/8	2-1/2	54447	51.30	54447-C8	58.50	54447-C4	63.70			
.062 (1/16)	.0620	.0620	.093	.312 (5x)	3	1/8	2-1/2	947062	50.70	947062-C8	57.90					
.062 (1/16)	.0620	.0620	.093	.500 (8x)	3	1/8	2-1/2	54462	51.30	54462-C8	58.50	54462-C4	63.70			
.062 (1/16)	.0620	.0620	.093	.625 (10x)	3	1/8	2-1/2	925162	56.60	925162-C8	63.80					
.062 (1/16)	.0620	.0620	.093	.750 (12x)	3	1/8	2-1/2	879462	59.60	879462-C8	66.80					
.078 (5/64)	.0780	.0780	.117	.406 (5x)	3	1/8	2-1/2	947078	50.70	947078-C8	57.90					
.078 (5/64)	.0780	.0780	.117	.625 (8x)	3	1/8	2-1/2	54478	51.30	54478-C8	58.50	54478-C4	63.70			
2.0 mm	.0787	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	851345	52.90	851345-C8	60.40						
.093 (3/32)	.0930	.0930	.139	.500 (5x)	3	1/8	2-1/2	947093	50.70	947093-C8	57.90					
.093 (3/32)	.0930	.0930	.139	.750 (8x)	3	1/8	2-1/2	54493	51.30	54493-C8	58.50	54493-C4	63.70			
.093 (3/32)	.0930	.0930	.139	.950 (10x)	3	1/8	2-1/2	925193	56.60	925193-C8	63.80					
.093 (3/32)	.0930	.0930	.139	1.125 (12x)	3	1/8	2-1/2	879493	59.60	879493-C8	66.80					
3.0 mm	.1181	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	851357	56.90	851357-C8	64.40						

D ₁			L ₂		L ₃		D ₂ (h6)	L ₁			3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+ .000" / - .002"	decimal equivalent		+ .030" / - .000"		+ .030" / - .000"											
.125 (1/8)	.1250	.1250	.187	.625 (5x)	3	1/8	2-1/2	947108	49.60	947108-C8	56.80					
.125 (1/8)	.1250	.1250	.187	1.000 (8x)	3	1/8	2-1/2	54508	50.70	54508-C8	57.90	54508-C4	63.10			
.125 (1/8)	.1250	.1250	.187	1.250 (10x)	3	1/8	2-1/2	925208	56.60	925208-C8	63.80					
.125 (1/8)	.1250	.1250	.187	1.500 (12x)	3	1/8	3	879508	59.60	879508-C8	66.80					
.156 (5/32)	.1562	.1562	.234	.750 (5x)	3	3/16	3	947110	56.00	947110-C8	63.20					
.156 (5/32)	.1562	.1562	.234	1.250 (8x)	3	3/16	3	54510	56.20	54510-C8	63.40					
.187 (3/16)	.1875	.1875	.281	1.000 (5x)	3	3/16	3	947112	56.00	947112-C8	63.20					
.187 (3/16)	.1875	.1875	.281	1.500 (8x)	3	3/16	3	54512	56.50	54512-C8	63.70	54512-C4	73.60			
.250 (1/4)	.2500	.2500	.375	1.250 (5x)	3	1/4	4	947116	58.10	947116-C8	66.80					
.250 (1/4)	.2500	.2500	.375	2.000 (8x)	3	1/4	4	54516	59.20	54516-C8	67.90	54516-C4	78.60			

PLEASE SEE SPEEDS & FEEDS ON PAGE 204

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius



- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
- Variable helix design (approx. 42°) reduces chatter and harmonics, and increases material removal rates
- h6 shank tolerance for high precision tool holders
- 3 flutes Center cutting
- Solid carbide CNC ground in the USA

TiB₂ Titanium Diboride	Best used in Non-Abrasive Aluminum Alloys and Magnesium Alloys! Extremely low affinity to aluminum. Prevents build-up on cutting edge and chip packing, extending tool life.
Amorphous Diamond	Outstanding performance in Copper, Brass, Bronze and High Silicon Aluminum! Improves wear resistance and lubricity. Thin film coating maintains sharp edge, improving performance and finish.

mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁			R	L ₂		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+ .0005" - .0005"	+ .00mm - .02mm	decimal equivalent	+ .001" - .001"	+ .010" - .000"									
			+ .025mm - .025mm	+ .25mm - .00mm									
.2 mm	.0078		.03 mm	.30 mm (1.5x)	3	4 mm	50 mm	986204	52.10	986204-C8	59.60		
.2 mm	.0078		.03 mm	.60 mm (3x)	3	4 mm	50 mm	973504	52.10	973504-C8	59.60		
.010	.0100		.002	.030 (3x)	3	1/8	1-1/2	50010	43.10	50010-C8	50.30		
.3 mm	.0118		.05 mm	.90 mm (3x)	3	4 mm	50 mm	973506	50.70	973506-C8	58.20		
.015 (1/64)	.0150		.002	.022 (1.5x)	3	1/8	1-1/2	61715	40.30	61715-C8	47.50		
.015 (1/64)	.0150		.002	.045 (3x)	3	1/8	1-1/2	50015	40.30	50015-C8	47.50	50015-C4	52.70
.015 (1/64)	.0150		.002	.078 (5x)	3	1/8	2-1/2	53015	47.90	53015-C8	55.10	53015-C4	60.30
.4 mm	.0157		.05 mm	.60 mm (1.5x)	3	4 mm	50 mm	986209	42.50	986209-C8	50.00		
.4 mm	.0157		.05 mm	1.20 mm (3x)	3	4 mm	50 mm	973509	42.50	973509-C8	50.00		
.5 mm	.0196		.05 mm	.75 mm (1.5x)	3	4 mm	50 mm	986211	37.50	986211-C8	45.00		
.5 mm	.0196		.05 mm	1.50 mm (3x)	3	4 mm	50 mm	973511	37.50	973511-C8	45.00		
.020	.0200		.002	.030 (1.5x)	3	1/8	1-1/2	61720	34.60	61720-C8	41.80		
.020	.0200		.002	.060 (3x)	3	1/8	1-1/2	50020	34.60	50020-C8	41.80	50020-C4	47.00
.020	.0200		.002	.100 (5x)	3	1/8	2-1/2	53020	42.30	53020-C8	49.50	53020-C4	54.70
.6 mm	.0236		.05 mm	.90 mm (1.5x)	3	4 mm	50 mm	986213	36.10	986213-C8	43.60		
.6 mm	.0236		.05 mm	1.80 mm (3x)	3	4 mm	50 mm	973513	36.10	973513-C8	43.60		
.025	.0250		.002	.038 (1.5x)	3	1/8	1-1/2	61725	33.30	61725-C8	40.50		
.025	.0250		.002	.075 (3x)	3	1/8	1-1/2	50025	33.30	50025-C8	40.50	50025-C4	45.70
.025	.0250		.002	.125 (5x)	3	1/8	2-1/2	53025	41.00	53025-C8	48.20	53025-C4	53.40
.7 mm	.0275		.08 mm	2.10 mm (3x)	3	4 mm	50 mm	973515	36.10	973515-C8	43.60		
.031 (1/32)	.0310		.003	.047 (1.5x)	3	1/8	1-1/2	61731	27.70	61731-C8	34.90		
.031 (1/32)	.0310		.003	.093 (3x)	3	1/8	1-1/2	50031	27.70	50031-C8	34.90	50031-C4	40.10
.031 (1/32)	.0310		.003	.156 (5x)	3	1/8	2-1/2	53031	34.90	53031-C8	42.10	53031-C4	47.30
.031 (1/32)	.0310		.005	.093 (3x)	3	1/8	1-1/2	901531	27.30	901531-C8	34.50		
.031 (1/32)	.0310		.010	.093 (3x)	3	1/8	1-1/2	904631	27.30	904631-C8	34.50		
.8 mm	.0314		.08 mm	1.20 mm (1.5x)	3	4 mm	50 mm	986218	30.40	986218-C8	37.90		
.8 mm	.0314		.08 mm	2.40 mm (3x)	3	4 mm	50 mm	973518	30.40	973518-C8	37.90		
.035	.0350		.003	.053 (1.5x)	3	1/8	1-1/2	61735	27.70	61735-C8	34.90		
.035	.0350		.003	.105 (3x)	3	1/8	1-1/2	50035	27.50	50035-C8	34.70		
.9 mm	.0354		.08 mm	2.7 mm (3x)	3	4 mm	50 mm	973520	30.40	973520-C8	37.90		
1.0 mm	.0393		.08 mm	1.50 mm (1.5x)	3	4 mm	50 mm	986222	30.40	986222-C8	37.90		
1.0 mm	.0393		.08 mm	3.00 mm (3x)	3	4 mm	50 mm	973522	30.40	973522-C8	37.90		
.040	.0400		.003	.060 (1.5x)	3	1/8	1-1/2	61740	27.70	61740-C8	34.90		
.040	.0400		.003	.120 (3x)	3	1/8	1-1/2	50040	27.70	50040-C8	34.90		
.040	.0400		.003	.203 (5x)	3	1/8	2-1/2	53040	34.90	53040-C8	42.10		
1.1 mm	.0433		.08 mm	3.00 mm (3x)	3	4 mm	50 mm	973524	30.40	973524-C8	37.90		

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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius (cont.)



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CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁		decimal equivalent	R	L ₂		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+ .0005" - .0005"	+ .00 mm - .02 mm		+ .001" - .001" + .025 mm - .025 mm	+ .010" - .000" + .25 mm - .00 mm									
.045		.0450	.003	.135 (3x)	3	1/8	1-1/2	50045	27.70	50045-C8	34.90		
.047 (3/64)		.0470	.003	.070 (1.5x)	3	1/8	1-1/2	61747	27.70	61747-C8	34.90		
.047 (3/64)		.0470	.003	.141 (3x)	3	1/8	1-1/2	50047	27.50	50047-C8	34.70	50047-C4	39.90
.047 (3/64)		.0470	.003	.250 (5x)	3	1/8	2-1/2	53047	34.90	53047-C8	42.10	53047-C4	47.30
.047 (3/64)		.0470	.005	.141 (3x)	3	1/8	1-1/2	901547	27.30	901547-C8	34.50		
.047 (3/64)		.0470	.010	.141 (3x)	3	1/8	1-1/2	904647	27.30	904647-C8	34.50	904647-C4	39.70
.047 (3/64)		.0470	.010	.250 (5x)	3	1/8	2-1/2	840747	34.70	840747-C8	41.90		
.047 (3/64)		.0470	.015	.141 (3x)	3	1/8	1-1/2	912347	27.30	912347-C8	34.50		
1.2 mm		.0472	.08 mm	1.80 mm (1.5x)	3	4 mm	50 mm	986227	30.40	986227-C8	37.90		
1.2 mm		.0472	.08 mm	3.50 mm (3x)	3	4 mm	50 mm	973527	30.40	973527-C8	37.90		
.050		.0500	.003	.075 (1.5x)	3	1/8	1-1/2	61750	27.50	61750-C8	34.70		
.050		.0500	.003	.150 (3x)	3	1/8	1-1/2	50050	27.50	50050-C8	34.70		
.050		.0500	.003	.250 (5x)	3	1/8	2-1/2	53050	34.90	53050-C8	42.10		
1.3 mm		.0511	.08 mm	4.00 mm (3x)	3	4 mm	50 mm	973529	30.40	973529-C8	37.90		
.055		.0550	.003	.083 (1.5x)	3	1/8	1-1/2	61755	27.50	61755-C8	34.70		
.055		.0550	.003	.165 (3x)	3	1/8	1-1/2	50055	27.50	50055-C8	34.70		
.055		.0550	.003	.275 (5x)	3	1/8	2-1/2	53055	34.90	53055-C8	42.10		
1.4 mm		.0551	.08 mm	2.10 mm (1.5x)	3	4 mm	50 mm	986231	30.40	986231-C8	37.90		
1.4 mm		.0551	.08 mm	4.00 mm (3x)	3	4 mm	50 mm	973531	30.40	973531-C8	37.90		
1.5 mm		.0590	.10 mm	2.20 mm (1.5x)	3	4 mm	50 mm	986233	28.20	986233-C8	35.70		
1.5 mm		.0590	.10 mm	4.50 mm (3x)	3	4 mm	50 mm	973533	28.20	973533-C8	35.70		
.060		.0600	.005	.090 (1.5x)	3	1/8	1-1/2	61760	27.50	61760-C8	34.70		
.060		.0600	.005	.180 (3x)	3	1/8	1-1/2	50060	27.50	50060-C8	34.70		
.060		.0600	.005	.312 (5x)	3	1/8	2-1/2	53060	34.90	53060-C8	42.10		
.060		.0600	.010	.180 (3x)	3	1/8	1-1/2	904660	34.90	904660-C8	42.10		
.062 (1/16)		.0620	.005	.093 (1.5x)	3	1/8	1-1/2	61762	25.50	61762-C8	32.70	61762-C4	37.90
.062 (1/16)		.0620	.005	.186 (3x)	3	1/8	1-1/2	50062	25.40	50062-C8	32.60	50062-C4	37.80
.062 (1/16)		.0620	.005	.312 (5x)	3	1/8	2-1/2	53062	33.10	53062-C8	40.30	53062-C4	45.50
.062 (1/16)		.0620	.010	.093 (1.5x)	3	1/8	1-1/2	878562	25.50	878562-C8	32.70		
.062 (1/16)		.0620	.010	.186 (3x)	3	1/8	1-1/2	904662	25.40	904662-C8	32.60		
.062 (1/16)		.0620	.010	.312 (5x)	3	1/8	2-1/2	840762	33.10	840762-C8	40.30		
.062 (1/16)		.0620	.015	.186 (3x)	3	1/8	1-1/2	912362	25.40	912362-C8	32.60		
.062 (1/16)		.0620	.020	.186 (3x)	3	1/8	1-1/2	925862	25.40	925862-C8	32.60		
1.6 mm		.0629	.10 mm	2.40 mm (1.5x)	3	4 mm	50 mm	986236	28.20	986236-C8	35.70		
1.6 mm		.0629	.10 mm	5.00 mm (3x)	3	4 mm	50 mm	973536	28.20	973536-C8	35.70		
1.7 mm		.0669	.10 mm	5.00 mm (3x)	3	4 mm	50 mm	973538	28.20	973538-C8	35.70		
.070		.0700	.005	.210 (3x)	3	1/8	1-1/2	50070	26.00	50070-C8	33.20		
1.8 mm		.0708	.10 mm	2.70 mm (1.5x)	3	4 mm	50 mm	986240	28.20	986240-C8	35.70		
1.8 mm		.0708	.10 mm	5.50 mm (3x)	3	4 mm	50 mm	973540	28.20	973540-C8	35.70		
1.9 mm		.0748	.10 mm	5.50 mm (3x)	3	4 mm	50 mm	973542	28.20	973542-C8	35.70		
.078 (5/64)		.0780	.005	.117 (1.5x)	3	1/8	1-1/2	61778	25.50	61778-C8	32.70	61778-C4	37.90
.078 (5/64)		.0780	.005	.234 (3x)	3	1/8	1-1/2	50078	25.40	50078-C8	32.60	50078-C4	37.80
.078 (5/64)		.0780	.005	.406 (5x)	3	1/8	2-1/2	53078	33.10	53078-C8	40.30	53078-C4	45.50
.078 (5/64)		.0780	.010	.117 (1.5x)	3	1/8	1-1/2	878578	25.50	878578-C8	32.70		
.078 (5/64)		.0780	.010	.234 (3x)	3	1/8	1-1/2	904678	25.40	904678-C8	32.60		
.078 (5/64)		.0780	.015	.234 (3x)	3	1/8	1-1/2	912378	25.40	912378-C8	32.60		
.078 (5/64)		.0780	.020	.234 (3x)	3	1/8	1-1/2	925878	25.40	925878-C8	32.60		
.078 (5/64)		.0780	.020	.406 (5x)	3	1/8	2-1/2	838278	33.10	838278-C8	40.30		

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VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius (cont.)



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CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁		decimal equivalent	R	L ₂		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
+.0005" -.0005"	+.00mm -.02mm		+.001" -.001" +.025mm -.025mm	+.010" -.000" +.25mm -.00mm									
2.0 mm		.0787	.10 mm	3.00 mm (1.5x)	3	4 mm	50 mm	986245	28.20	986245-C8	35.70		
2.0 mm		.0787	.10 mm	6.00 mm (3x)	3	4 mm	50 mm	973545	28.20	973545-C8	35.70		
.080		.0800	.005	.240 (3x)	3	1/8	1-1/2	50080	26.00	50080-C8	33.20		
.090		.0900	.005	.270 (3x)	3	1/8	1-1/2	50090	26.00	50090-C8	33.20		
.093 (3/32)		.0930	.005	.139 (1.5x)	3	1/8	1-1/2	61793	25.50	61793-C8	32.70	61793-C4	37.90
.093 (3/32)		.0930	.005	.279 (3x)	3	1/8	1-1/2	50093	25.40	50093-C8	32.60	50093-C4	37.80
.093 (3/32)		.0930	.005	.500 (5x)	3	1/8	2-1/2	53093	33.10	53093-C8	40.30	53093-C4	45.50
.093 (3/32)		.0930	.010	.139 (1.5x)	3	1/8	1-1/2	878593	25.50	878593-C8	32.70		
.093 (3/32)		.0930	.010	.279 (3x)	3	1/8	1-1/2	904693	25.40	904693-C8	32.60	904693-C4	37.80
.093 (3/32)		.0930	.010	.500 (5x)	3	1/8	2-1/2	840793	33.10	840793-C8	40.30		
.093 (3/32)		.0930	.015	.279 (3x)	3	1/8	1-1/2	912393	25.40	912393-C8	32.60		
.093 (3/32)		.0930	.020	.139 (1.5x)	3	1/8	1-1/2	889493	25.50	889493-C8	32.70		
.093 (3/32)		.0930	.020	.279 (3x)	3	1/8	1-1/2	925893	25.40	925893-C8	32.60		
.093 (3/32)		.0930	.030	.139 (1.5x)	3	1/8	1-1/2	893893	25.50	893893-C8	32.70		
.093 (3/32)		.0930	.030	.279 (3x)	3	1/8	1-1/2	904193	25.40	904193-C8	32.60		
2.5 mm		.0984	.10 mm	7.50 mm (3x)	3	4 mm	50 mm	973551	28.20	973551-C8	35.70		
.100		.1000	.005	.150 (1.5x)	3	1/8	1-1/2	61800	25.50	61800-C8	32.70		
.100		.1000	.005	.300 (3x)	3	1/8	1-1/2	50100	25.50	50100-C8	32.70		
3.0 mm		.1181	.10 mm	9.00 mm (3x)	3	4 mm	50 mm	973557	28.20	973557-C8	35.70		

D ₁ +.000" -.002"	decimal equivalent	R +.001" -.001"	L ₂ +.030" -.000"		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
.125 (1/8)	.1250	.005	.187 (1.5x)	3	1/8	1-1/2	61808	25.40	61808-C8	32.60	61808-C4	37.80
.125 (1/8)	.1250	.005	.375 (3x)	3	1/8	1-1/2	50108	25.40	50108-C8	32.60	50108-C4	37.80
.125 (1/8)	.1250	.005	.625 (5x)	3	1/8	2-1/2	53108	33.10	53108-C8	40.30	53108-C4	45.50
.125 (1/8)	.1250	.010	.187 (1.5x)	3	1/8	1-1/2	878608	24.70	878608-C8	31.90		
.125 (1/8)	.1250	.010	.375 (3x)	3	1/8	1-1/2	904708	24.00	904708-C8	31.20	904708-C4	36.40
.125 (1/8)	.1250	.010	.625 (5x)	3	1/8	2-1/2	840808	32.30	840808-C8	39.50		
.125 (1/8)	.1250	.015	.187 (1.5x)	3	1/8	1-1/2	831208	24.00	831208-C8	31.20		
.125 (1/8)	.1250	.015	.375 (3x)	3	1/8	1-1/2	912408	24.00	912408-C8	31.20	912408-C4	36.40
.125 (1/8)	.1250	.015	.625 (5x)	3	1/8	2-1/2	852408	32.30	852408-C8	39.50		
.125 (1/8)	.1250	.020	.187 (1.5x)	3	1/8	1-1/2	889508	27.20	889508-C8	34.40		
.125 (1/8)	.1250	.020	.375 (3x)	3	1/8	1-1/2	925908	24.00	925908-C8	31.20	925908-C4	36.40
.125 (1/8)	.1250	.020	.625 (5x)	3	1/8	2-1/2	838308	32.30	838308-C8	39.50		
.125 (1/8)	.1250	.030	.187 (1.5x)	3	1/8	1-1/2	893908	27.20	893908-C8	34.40		
.125 (1/8)	.1250	.030	.375 (3x)	3	1/8	1-1/2	904208	24.00	904208-C8	31.20	904208-C4	36.40
.125 (1/8)	.1250	.030	.625 (5x)	3	1/8	2-1/2	829708	32.30	829708-C8	39.50		
.125 (1/8)	.1250	.040	.375 (3x)	3	1/8	1-1/2	892808	28.70	892808-C8	35.90		
.140 (9/64)	.1406	.015	.425 (3x)	3	3/16	2	912409	26.40	912409-C8	33.60		
.156 (5/32)	.1562	.005	.235 (1.5x)	3	3/16	2	61810	26.40	61810-C8	33.60		
.156 (5/32)	.1562	.005	.470 (3x)	3	3/16	2	50110	26.40	50110-C8	33.60	50110-C4	43.50
.156 (5/32)	.1562	.005	.750 (5x)	3	3/16	3	53110	36.50	53110-C8	43.70		
.156 (5/32)	.1562	.020	.470 (3x)	3	3/16	2	925910	26.40	925910-C8	33.60		
.156 (5/32)	.1562	.030	.470 (3x)	3	3/16	2	904210	26.40	904210-C8	33.60		
.187 (3/16)	.1875	.005	.285 (1.5x)	3	3/16	2	61812	26.40	61812-C8	33.60	61812-C4	43.50
.187 (3/16)	.1875	.005	.562 (3x)	3	3/16	2	50112	26.40	50112-C8	33.60	50112-C4	43.50
.187 (3/16)	.1875	.005	1.000 (5x)	3	3/16	3	53112	36.50	53112-C8	43.70	53112-C4	51.00
.187 (3/16)	.1875	.010	.562 (3x)	3	3/16	2	904712	37.20	904712-C8	44.40		
.187 (3/16)	.1875	.015	.285 (1.5x)	3	3/16	2	831212	37.20	831212-C8	44.40		
.187 (3/16)	.1875	.015	.562 (3x)	3	3/16	2	912412	37.20	912412-C8	44.40		

continued on next page

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius (cont.)



continued from previous page

ALUMINUM ALLOYS

CUTTER DIAMETER	CORNER RADIUS	LENGTH OF CUT	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED		AMORPHOUS DIAMOND	
D ₁ ^{+ .000"} - .002"	R ^{+ .001"} - .001"	L ₂ ^{+ .030"} - .000"		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE	3 FL	PRICE
.187 (3/16)	.1875	.020	.285 (1.5x)	3	3/16	2	889512 37.20	889512-C8	44.40		
.187 (3/16)	.1875	.020	.562 (3x)	3	3/16	2	925912 37.20	925912-C8	44.40		
.187 (3/16)	.1875	.030	.285 (1.5x)	3	3/16	2	893912 37.20	893912-C8	44.40		
.187 (3/16)	.1875	.030	.562 (3x)	3	3/16	2	904212 37.20	904212-C8	44.40	904212-C4	54.30
.187 (3/16)	.1875	.030	1.000 (5x)	3	3/16	3	829712 39.20	829712-C8	46.40		
.187 (3/16)	.1875	.060	.562 (3x)	3	3/16	2	834812 37.20	834812-C8	44.40		
.250 (1/4)	.2500	.005	.750 (3x)	3	1/4	2-1/2	901616 34.80	901616-C8	42.50		
.250 (1/4)	.2500	.010	.375 (1.5x)	3	1/4	2-1/2	61816 31.10	61816-C8	38.80	61816-C4	50.50
.250 (1/4)	.2500	.010	.750 (3x)	3	1/4	2-1/2	50116 31.10	50116-C8	38.80	50116-C4	50.50
.250 (1/4)	.2500	.010	1.250 (5x)	3	1/4	4	53116 44.60	53116-C8	53.30	53116-C4	64.00
.250 (1/4)	.2500	.015	.750 (3x)	3	1/4	2-1/2	912416 33.00	912416-C8	40.70		
.250 (1/4)	.2500	.020	.375 (1.5x)	3	1/4	2-1/2	889516 33.00	889516-C8	40.70		
.250 (1/4)	.2500	.020	.750 (3x)	3	1/4	2-1/2	925916 33.00	925916-C8	40.70	925916-C4	52.40
.250 (1/4)	.2500	.030	.375 (1.5x)	3	1/4	2-1/2	893916 33.00	893916-C8	40.70		
.250 (1/4)	.2500	.030	.750 (3x)	3	1/4	2-1/2	904216 33.00	904216-C8	40.70		
.250 (1/4)	.2500	.060	.750 (3x)	3	1/4	2-1/2	834816 33.00	834816-C8	40.70		
.375 (3/8)	.3750	.015	1.125 (3x)	3	3/8	2-1/2	912424 54.30	912424-C8	74.20		
.375 (3/8)	.3750	.030	1.125 (3x)	3	3/8	2-1/2	904224 54.30	904224-C8	74.20		

SPEEDS & FEEDS (Variable Helix for Aluminum & Non-Ferrous Alloys)

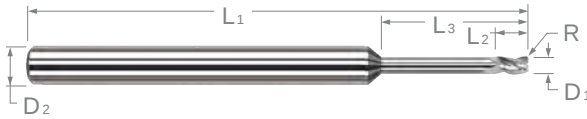
Important Note: Values in table are in inches and are based on standard (3x Dia) length of cut end mills. For 2 flutes, table values of IPT must be increased to 110% before adjustments for different lengths of cut. For shorter lengths of cut, table values of IPT must be increased (for 0.8x, increase to 125%; for 1.5x, increase to 115%). For longer lengths of cut, table values of IPT must be reduced (for 4x, reduce to 85%; for 5x, reduce to 70%; for 8x, reduce to 58%). For complete speeds and feeds charts, please see www.harveytool.com

Cutter Series	Material	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter									
			.015	.031	.047	.062	.078	.093	.125	.187	.250	
Uncoated	Aluminum Alloys: Casting (2xx, 5xx, 7xx, 8xx)	750	Slotting	.00020	.00041	.00062	.00082	.00103	.00123	.00165	.00247	.00330
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000	Roughing	.00023	.00048	.00072	.00095	.00120	.00143	.00193	.00288	.00385
	Magnesium Alloys: All alloys	1500	Finishing	.00025	.00051	.00078	.00102	.00129	.00153	.00206	.00309	.00413
	Zinc Alloys: All alloys	800	Max	.00026	.00055	.00083	.00109	.00137	.00164	.00220	.00329	.00440
	Copper Alloys: High Coppers - 90%+ (C1xxxx)	225	Slotting	.00016	.00033	.00050	.00065	.00082	.00098	.00132	.00197	.00264
	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx)	500	Roughing	.00018	.00038	.00058	.00076	.00096	.00115	.00154	.00230	.00308
	Phosphor Bronzes (Copper Tin alloys, C5xxxx)	225	Finishing	.00020	.00041	.00062	.00082	.00103	.00123	.00165	.00247	.00330
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500	Max	.00021	.00044	.00066	.00087	.00110	.00131	.00176	.00263	.00352
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .5x Dia Finishing: 1x Dia Axial Depth of Cut*: Slotting: .5x Dia Roughing: .5x - 1x Dia Finishing: .5x - 1x Dia									
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	225										
TiB ₂	Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550	Slotting	.00026	.00053	.00081	.00106	.00134	.00160	.00215	.00321	.00429
	Aluminum: Casting (2xx, 5xx, 7xx, 8xx)	1000	Roughing	.00030	.00062	.00094	.00124	.00156	.00186	.00250	.00374	.00501
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1400	Finishing	.00032	.00066	.00101	.00133	.00167	.00199	.00268	.00401	.00536
	Magnesium Alloys: All alloys	2000	Max	.00034	.00071	.00108	.00142	.00178	.00213	.00286	.00428	.00572
Amorphous Diamond	Zinc Alloys: All alloys	1100	Slotting	.00022	.00045	.00068	.00090	.00113	.00135	.00182	.00272	.00363
	Aluminum (High Silicon): Casting - 3% - 5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	2500	Roughing	.00025	.00053	.00080	.00105	.00132	.00158	.00212	.00317	.00424
	Casting - 5% - 8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	2000	Finishing	.00027	.00056	.00085	.00113	.00142	.00169	.00227	.00339	.00454
	Casting - 8% - 12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	1500	Max	.00029	.00060	.00091	.00120	.00151	.00180	.00242	.00362	.00484
	Casting - 12% - 16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	1000	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: 1x Dia Axial Depth of Cut*: Slotting: .4x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia									
	Wrought - 5% - 8% Si (4xxx)	2200										
	Wrought - 8% - 12% Si (4xxx)	1700	Slotting	.00017	.00036	.00055	.00072	.00091	.00108	.00145	.00217	.00290
	Copper Alloys: High Coppers - 90%+ (C1xxxx)	800	Roughing	.00020	.00042	.00064	.00084	.00106	.00126	.00169	.00253	.00339
	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx)	1500	Finishing	.00022	.00045	.00068	.00090	.00113	.00135	.00182	.00272	.00363
	Phosphor Bronzes (Copper Tin alloys, C5xxxx)	800	Max	.00023	.00048	.00073	.00096	.00121	.00144	.00194	.00290	.00387
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	1000	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: 1x Dia Axial Depth of Cut*: Slotting: .4x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia									
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	1000										
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	800	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: 1x Dia Axial Depth of Cut*: Slotting: .4x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia									
	Cast Copper Alloys (C80100-C82800, C86300, C90200-C91700, C96200-C96600, C99300)	150										
	Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	750	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: 1x Dia Axial Depth of Cut*: Slotting: .4x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia									

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius – Long Reach, Stub Flute



- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
- Long reach design for deep cavities
- Reduced neck diameter to avoid heeling
- Variable helix design (approx. 42°) reduces chatter and harmonics and increases material removal rates
- Small corner radius for improved strength
- 3 flutes
- h6 shank tolerance for high precision tool holders
- Center cutting
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER			CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED	
D ₁			R	L ₂	L ₃		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE
$+0.005"$ $-0.005"$	$+0.00$ -0.02 mm	decimal equivalent	$+0.001"$ $-0.001"$ $+0.025$ mm -0.025 mm	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm	$+0.010"$ $-0.000"$ $+0.25$ mm -0.00 mm							
.015 (1/64)		.0150	.002	.023	.078 (5x)	3	1/8	2-1/2	956515	52.50	956515-C8	59.70
.015 (1/64)		.0150	.002	.023	.125 (8x)	3	1/8	2-1/2	961315	53.70	961315-C8	60.90
.020		.0200	.002	.030	.100 (5x)	3	1/8	2-1/2	956520	49.80	956520-C8	57.00
.025		.0250	.002	.038	.125 (5x)	3	1/8	2-1/2	956525	48.50	956525-C8	55.70
.031 (1/32)		.0310	.003	.047	.156 (5x)	3	1/8	2-1/2	956531	45.30	956531-C8	52.50
.031 (1/32)		.0310	.003	.047	.250 (8x)	3	1/8	2-1/2	961331	46.50	961331-C8	53.70
.031 (1/32)		.0310	.003	.047	.312 (10x)	3	1/8	2-1/2	861031	50.00	861031-C8	57.20
.031 (1/32)		.0310	.003	.047	.375 (12x)	3	1/8	2-1/2	949631	51.30	949631-C8	58.50
.031 (1/32)		.0310	.010	.047	.250 (8x)	3	1/8	2-1/2	876231	46.50	876231-C8	53.70
1.0 mm		.0393	.08 mm	1.50 mm	5.0 mm (5x)	3	4 mm	50 mm	907622	50.00	907622-C8	57.50
.040		.0400	.003	.060	.203 (5x)	3	1/8	2-1/2	956540	45.60	956540-C8	52.80
.040		.0400	.003	.060	.325 (8x)	3	1/8	2-1/2	961340	46.50	961340-C8	53.70
.047 (3/64)		.0470	.003	.071	.250 (5x)	3	1/8	2-1/2	956547	45.30	956547-C8	52.50
.047 (3/64)		.0470	.003	.071	.375 (8x)	3	1/8	2-1/2	961347	46.50	961347-C8	53.70
.047 (3/64)		.0470	.003	.071	.570 (12x)	3	1/8	2-1/2	949647	51.30	949647-C8	58.50
.047 (3/64)		.0470	.010	.071	.375 (8x)	3	1/8	2-1/2	876247	46.50	876247-C8	53.70
.062 (1/16)		.0620	.005	.093	.312 (5x)	3	1/8	2-1/2	956562	45.30	956562-C8	52.50
.062 (1/16)		.0620	.005	.093	.500 (8x)	3	1/8	2-1/2	961362	46.50	961362-C8	53.70
.062 (1/16)		.0620	.005	.093	.625 (10x)	3	1/8	2-1/2	861062	50.00	861062-C8	57.20
.062 (1/16)		.0620	.005	.093	.750 (12x)	3	1/8	2-1/2	949662	51.30	949662-C8	58.50
.062 (1/16)		.0620	.005	.093	.950 (15x)	3	1/8	2-1/2	886862	51.30	886862-C8	58.50
.062 (1/16)		.0620	.010	.093	.500 (8x)	3	1/8	2-1/2	876262	46.50	876262-C8	53.70
.078 (5/64)		.0780	.005	.118	.406 (5x)	3	1/8	2-1/2	956578	45.30	956578-C8	52.50
.078 (5/64)		.0780	.005	.118	.625 (8x)	3	1/8	2-1/2	961378	46.50	961378-C8	53.70
.078 (5/64)		.0780	.005	.118	.940 (12x)	3	1/8	2-1/2	949678	51.30	949678-C8	58.50
.078 (5/64)		.0780	.010	.118	.625 (8x)	3	1/8	2-1/2	876278	46.50	876278-C8	53.70
2.0 mm		.0787	.10 mm	3.00 mm	10.0 mm (5x)	3	4 mm	50 mm	907645	50.00	907645-C8	57.50
.093 (3/32)		.0930	.005	.140	.500 (5x)	3	1/8	2-1/2	956593	45.30	956593-C8	52.50
.093 (3/32)		.0930	.005	.140	.750 (8x)	3	1/8	2-1/2	961393	46.50	961393-C8	53.70
.093 (3/32)		.0930	.005	.140	.950 (10x)	3	1/8	2-1/2	861093	50.00	861093-C8	57.20
.093 (3/32)		.0930	.005	.140	1.125 (12x)	3	1/8	2-1/2	949693	51.30	949693-C8	58.50
.093 (3/32)		.0930	.005	.140	1.400 (15x)	3	1/8	3	886893	53.90	886893-C8	61.10
.093 (3/32)		.0930	.010	.140	.750 (8x)	3	1/8	2-1/2	876293	46.50	876293-C8	53.70
.093 (3/32)		.0930	.030	.140	.500 (5x)	3	1/8	2-1/2	761093	45.30	761093-C8	52.50
.093 (3/32)		.0930	.030	.140	.750 (8x)	3	1/8	2-1/2	891893	46.50	891893-C8	53.70
3.0 mm		.1181	.10 mm	4.50 mm	15.0 mm (5x)	3	4 mm	50 mm	907657	47.10	907657-C8	54.60
D ₁ $+0.000"$ $-0.002"$		decimal equivalent	R $+0.001"$ $-0.001"$	L ₂ $+0.030"$ $-0.000"$	L ₃ $+0.030"$ $-0.000"$		D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE
.125 (1/8)		.1250	.005	.187	.625 (5x)	3	1/8	2-1/2	956608	44.60	956608-C8	51.80
.125 (1/8)		.1250	.005	.187	1.000 (8x)	3	1/8	2-1/2	961408	45.60	961408-C8	52.80

continued on next page

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Corner Radius – Long Reach, Stub Flute (cont.)



continued from previous page

CUTTER DIAMETER	CORNER RADIUS	LENGTH OF CUT	OVERALL REACH	FLUTES	SHANK DIA.	OAL	UNCOATED		TiB ₂ COATED	
D ₁ $\pm .000$ " -.002"	decimal equivalent	R $\pm .001$ " -.001"	L ₂ $\pm .030$ " -.000"	L ₃ $\pm .030$ " -.000"	D ₂ (h6)	L ₁	3 FL	PRICE	3 FL	PRICE
.125 (1/8)	.1250	.005	.187	1.250 (10x)	3	1/8	2-1/2	861108	48.10	861108-C8 55.30
.125 (1/8)	.1250	.005	.187	1.500 (12x)	3	1/8	3	949708	49.30	949708-C8 56.50
.125 (1/8)	.1250	.005	.187	1.875 (15x)	3	1/8	3	886908	51.90	886908-C8 59.10
.125 (1/8)	.1250	.010	.187	1.000 (8x)	3	1/8	2-1/2	876308	45.60	876308-C8 52.80
.125 (1/8)	.1250	.030	.187	1.000 (8x)	3	1/8	2-1/2	891908	45.60	891908-C8 52.80
.156 (5/32)	.1562	.005	.235	.750 (5x)	3	3/16	3	956610	50.10	956610-C8 57.30
.156 (5/32)	.1562	.005	.235	1.250 (8x)	3	3/16	3	961410	51.50	961410-C8 58.70
.187 (3/16)	.1875	.005	.285	1.000 (5x)	3	3/16	3	956612	50.10	956612-C8 57.30
.187 (3/16)	.1875	.005	.285	1.500 (8x)	3	3/16	3	961412	51.50	961412-C8 58.70
.187 (3/16)	.1875	.005	.285	2.250 (12x)	3	3/16	4	949712	64.20	949712-C8 71.90
.187 (3/16)	.1875	.030	.285	1.000 (5x)	3	3/16	3	761112	50.10	761112-C8 57.30
.187 (3/16)	.1875	.030	.285	1.500 (8x)	3	3/16	3	891912	51.50	891912-C8 58.70
.250 (1/4)	.2500	.010	.375	1.250 (5x)	3	1/4	4	956616	52.50	956616-C8 61.20
.250 (1/4)	.2500	.010	.375	2.000 (8x)	3	1/4	4	961416	53.50	961416-C8 62.20
.250 (1/4)	.2500	.010	.375	3.000 (12x)	3	1/4	6	949716	67.50	949716-C8 79.90
.250 (1/4)	.2500	.030	.375	1.250 (5x)	3	1/4	4	761116	52.50	761116-C8 61.20
.250 (1/4)	.2500	.030	.375	2.000 (8x)	3	1/4	4	891916	53.50	891916-C8 62.20

SPEEDS & FEEDS (Variable Helix – Long Reach, Stub Flute for Aluminum Alloys)

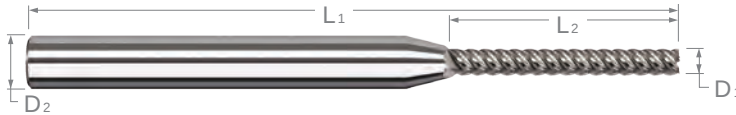
Important Note: Values in table are in inches and are based on reached (8x Dia) end mills. For shorter reaches, table values of IPT must be increased (for 3x, increase to 135%; for 5x, increase to 125%). For longer reaches, table values of IPT and DOC must be reduced (for 10x, reduce to 90%; for 12x, reduce to 80%). For complete speeds and feeds charts, please see www.harveytool.com.

Cutter Series	Material	SFM	Chip Load Per Tooth (IPT) By Cutter Diameter									
			.015	.031	.047	.062	.078	.093	.125	.187	.250	
Uncoated	Aluminum Alloys: Casting (2xx, 5xx, 7xx, 8xx)	750	Slotting	.00016	.00033	.00050	.00065	.00082	.00098	.00132	.00197	.00264
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000	Roughing	.00018	.00038	.00058	.00076	.00096	.00115	.00154	.00230	.00308
	Magnesium Alloys: All alloys	1500	Finishing	.00020	.00041	.00062	.00082	.00103	.00123	.00165	.00247	.00330
	Zinc Alloys: All alloys	800	Max	.00021	.00044	.00066	.00087	.00110	.00131	.00176	.00263	.00352
	Copper Alloys: High Coppers - 90%+ (C1xxxx)	225	Slotting	.00013	.00026	.00040	.00052	.00066	.00079	.00106	.00158	.00211
	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)	500	Roughing	.00015	.00031	.00046	.00061	.00077	.00092	.00123	.00184	.00246
	Phosphor Bronzes (Copper Tin alloys, C5xxxx)	225	Finishing	.00016	.00033	.00050	.00065	.00082	.00098	.00132	.00197	.00264
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500	Max	.00017	.00035	.00053	.00070	.00088	.00105	.00141	.00211	.00282
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: .1x Dia		Axial Depth of Cut*: Slotting: .4x Dia Roughing: .5x - 1x Dia Finishing: .5x - 1x Dia							
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	225	Slotting	.00021	.00043	.00065	.00085	.00107	.00128	.00172	.00257	.00343
TiB ₂	Aluminum: Casting (2xx, 5xx, 7xx, 8xx)	1000	Roughing	.00024	.00050	.00075	.00099	.00125	.00149	.00200	.00299	.00400
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1400	Finishing	.00026	.00053	.00081	.00106	.00134	.00160	.00215	.00321	.00429
	Magnesium Alloys: All alloys	2000	Max	.00027	.00057	.00086	.00113	.00143	.00170	.00229	.00342	.00458
	Zinc Alloys: All alloys	1100	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .4x Dia Finishing: .1x Dia		Axial Depth of Cut*: Slotting: .4x Dia Roughing: .5x - 1x Dia Finishing: .5x - 1x Dia							
Amorphous Diamond	Aluminum (High Silicon): Casting - 3% - 5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	2500	Slotting	.00017	.00036	.00055	.00072	.00091	.00108	.00145	.00217	.00290
	Casting - 5% - 8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	2000	Roughing	.00020	.00042	.00064	.00084	.00106	.00126	.00169	.00253	.00339
	Casting - 8% - 12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	1500	Finishing	.00022	.00045	.00068	.00090	.00113	.00135	.00182	.00272	.00363
	Casting - 12% - 16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	1000	Max	.00023	.00048	.00073	.00096	.00121	.00144	.00194	.00290	.00387
	Wrought - 5% - 8% Si (4xxx)	2200	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .3x Dia Finishing: .1x Dia		Axial Depth of Cut*: Slotting: .3x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia							
	Wrought - 8% - 12% Si (4xxx)	1700	Slotting	.00014	.00029	.00044	.00058	.00072	.00086	.00116	.00174	.00232
	Copper Alloys: High Coppers - 90%+ (C1xxxx)	800	Roughing	.00016	.00034	.00051	.00067	.00085	.00101	.00136	.00203	.00271
	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)	1500	Finishing	.00017	.00036	.00055	.00072	.00091	.00108	.00145	.00217	.00290
	Phosphor Bronzes (Copper Tin alloys, C5xxxx)	800	Max	.00019	.00038	.00058	.00077	.00097	.00115	.00155	.00232	.00310
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	1000	Radial Depth of Cut*: Slotting: 1x Dia Roughing: .3x Dia Finishing: .1x Dia		Axial Depth of Cut*: Slotting: .3x Dia Roughing: .3x - .8x Dia Finishing: .5x - 1x Dia							
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	1000	Slotting	.00014	.00029	.00044	.00058	.00072	.00086	.00116	.00174	.00232
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	800	Roughing	.00016	.00034	.00051	.00067	.00085	.00101	.00136	.00203	.00271
	Cast Copper Alloys (C80100-C82800, C86300, C90200-C91700, C96200-C96600, C99300)	150	Finishing	.00017	.00036	.00055	.00072	.00091	.00108	.00145	.00217	.00290
	Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	750	Max	.00019	.00038	.00058	.00077	.00097	.00115	.00155	.00232	.00310

* If less than minimum Axial or Radial DOC values are used, increased feed rates are possible. If greater than maximum Axial and Radial DOC values are used, decreased feed rates may be needed.

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Finishers – Square



- Optimized for aluminum and aluminum alloys with excellent performance in copper, brass, and bronze alloys
- Variable helix design (approx. 50°) reduces chatter and harmonics, improving finish
- High helix for effective chip evacuation
- h6 shank tolerance for high precision tool holders
- End cutting (not center cutting)
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		TiB ₂ COATED	
D ₁							TOOL #	PRICE	TOOL #	PRICE
$\begin{matrix} +.0005" \\ -.0005" \end{matrix}$	$\begin{matrix} +.00mm \\ -.02mm \end{matrix}$	decimal equivalent	$\begin{matrix} +.010" \\ -.000" \\ L_2 \\ +.25mm \\ -.00mm \end{matrix}$		D ₂ (h6)	L ₁				
.015 (1/64)		.0150	.078 (5x)	4	1/8	2-1/2	66715	47.30	66715-C8	54.50
.015 (1/64)		.0150	.125 (8x)	4	1/8	2-1/2	67115	47.90	67115-C8	55.10
.020		.0200	.100 (5x)	4	1/8	2-1/2	66720	46.00	66720-C8	53.20
.020		.0200	.160 (8x)	4	1/8	2-1/2	67120	47.60	67120-C8	54.80
.025		.0250	.125 (5x)	4	1/8	2-1/2	66725	44.80	66725-C8	52.00
.025		.0250	.203 (8x)	4	1/8	2-1/2	67125	45.80	67125-C8	53.00
.031 (1/32)		.0310	.093 (3x)	5	1/8	1-1/2	948831	30.50	948831-C8	37.70
.031 (1/32)		.0310	.156 (5x)	5	1/8	2-1/2	66731	42.70	66731-C8	49.90
.031 (1/32)		.0310	.250 (8x)	5	1/8	2-1/2	67131	43.90	67131-C8	51.10
.031 (1/32)		.0310	.312 (10x)	5	1/8	2-1/2	917631	56.00	917631-C8	63.20
1.0 mm		.0393	5.00 mm (5x)	5	4 mm	50 mm	915522	43.90	915522-C8	51.40
1.0 mm		.0393	8.00 mm (8x)	5	4 mm	50 mm	907122	45.30	907122-C8	52.80
.040		.0400	.203 (5x)	5	1/8	2-1/2	66740	42.70	66740-C8	49.90
.040		.0400	.325 (8x)	5	1/8	2-1/2	67140	43.90	67140-C8	51.10
.047 (3/64)		.0470	.141 (3x)	5	1/8	1-1/2	948847	30.50	948847-C8	37.70
.047 (3/64)		.0470	.250 (5x)	5	1/8	2-1/2	66747	42.70	66747-C8	49.90
.047 (3/64)		.0470	.375 (8x)	5	1/8	2-1/2	67147	43.90	67147-C8	51.10
.050		.0500	.250 (5x)	5	1/8	2-1/2	66750	42.70	66750-C8	49.90
.050		.0500	.400 (8x)	5	1/8	2-1/2	67150	43.90	67150-C8	51.10
.060		.0600	.312 (5x)	5	1/8	2-1/2	66760	39.70	66760-C8	46.90
.060		.0600	.500 (8x)	5	1/8	2-1/2	67160	40.90	67160-C8	48.10
.062 (1/16)		.0620	.186 (3x)	5	1/8	1-1/2	948862	28.50	948862-C8	35.70
.062 (1/16)		.0620	.312 (5x)	5	1/8	2-1/2	66762	39.70	66762-C8	46.90
.062 (1/16)		.0620	.500 (8x)	5	1/8	2-1/2	67162	40.90	67162-C8	48.10
.062 (1/16)		.0620	.625 (10x)	5	1/8	2-1/2	917662	60.10	917662-C8	67.30
.078 (5/64)		.0780	.234 (3x)	5	1/8	1-1/2	948878	28.50	948878-C8	35.70
.078 (5/64)		.0780	.406 (5x)	5	1/8	2-1/2	66778	39.70	66778-C8	46.90
.078 (5/64)		.0780	.625 (8x)	5	1/8	2-1/2	67178	40.90	67178-C8	48.10
2.0 mm		.0787	10.00 mm (5x)	5	4 mm	50 mm	915545	42.50	915545-C8	50.00
2.0 mm		.0787	16.00 mm (8x)	5	4 mm	50 mm	907145	43.90	907145-C8	51.40
.093 (3/32)		.0930	.279 (3x)	5	1/8	1-1/2	948893	28.50	948893-C8	35.70
.093 (3/32)		.0930	.375 (4x)	5	1/8	2-1/2	829493	39.20	829493-C8	46.40
.093 (3/32)		.0930	.500 (5x)	5	1/8	2-1/2	66793	39.70	66793-C8	46.90
.093 (3/32)		.0930	.750 (8x)	5	1/8	2-1/2	67193	40.90	67193-C8	48.10
.093 (3/32)		.0930	.950 (10x)	5	1/8	2-1/2	917693	60.10	917693-C8	67.30

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ALUMINUM ALLOYS

VARIABLE HELIX END MILLS FOR ALUMINUM ALLOYS

Finishers – Square (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	FLUTES	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		TiB ₂ COATED	
D ₁ +.0005" -.0005" +.00 mm -.02 mm decimal equivalent			L ₂ +.010" -.000" +.25 mm -.00 mm		D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.100			.500 (5x)	5	1/8	2-1/2	66800	39.70	66800-C8	46.90
.100			.800 (8x)	5	1/8	2-1/2	67200	40.90	67200-C8	48.10
.109 (7/64)			.570 (5x)	5	1/8	2-1/2	66802	39.70	66802-C8	46.90
.109 (7/64)			.900 (8x)	5	1/8	2-1/2	67202	40.90	67202-C8	48.10
3.0 mm			15.00 mm (5x)	5	4 mm	50 mm	915557	42.50	915557-C8	50.00
3.0 mm			24.00 mm (8x)	5	4 mm	50 mm	907157	43.90	907157-C8	51.40

D ₁ +.000" - .002" decimal equivalent	L ₂ +.030" - .000"	D ₂ (h6)	L ₁	TOOL #	PRICE	TOOL #	PRICE
.125 (1/8)	.1250	.187 (1.5x)	5	1/8	1-1/2	856908	26.40
.125 (1/8)	.1250	.375 (3x)	5	1/8	1-1/2	948908	26.40
.125 (1/8)	.1250	.500 (4x)	5	1/8	2-1/2	829508	38.20
.125 (1/8)	.1250	.625 (5x)	5	1/8	2-1/2	66808	38.70
.125 (1/8)	.1250	1.000 (8x)	5	1/8	2-1/2	67208	40.10
.125 (1/8)	.1250	1.125 (10x)	5	1/8	2-1/2	917708	59.40
.156 (5/32)	.1562	.750 (5x)	5	3/16	3	66810	41.40
.156 (5/32)	.1562	1.250 (8x)	5	3/16	3	67210	43.10
.187 (3/16)	.1875	.285 (1.5x)	5	3/16	2	856912	31.10
.187 (3/16)	.1875	.570 (3x)	5	3/16	2	948912	31.10
.187 (3/16)	.1875	1.000 (5x)	5	3/16	3	66812	41.40
.187 (3/16)	.1875	1.500 (8x)	5	3/16	3	67212	43.10
.187 (3/16)	.1875	1.875 (10x)	5	3/16	4	917712	60.30
.250 (1/4)	.2500	.375 (1.5x)	5	1/4	2-1/2	856916	41.00
.250 (1/4)	.2500	.750 (3x)	5	1/4	2-1/2	948916	41.00
.250 (1/4)	.2500	1.250 (5x)	5	1/4	4	66816	50.50
.250 (1/4)	.2500	2.000 (8x)	5	1/4	4	67216	51.80
.375 (3/8)	.3750	1.125 (3x)	5	3/8	2-1/2	948924	57.30
.500 (1/2)	.5000	1.500 (3x)	5	1/2	3	948932	77.10

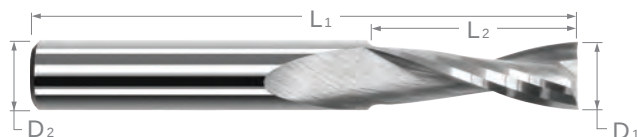
ALUMINUM ALLOYS

SPEEDS & FEEDS (High Helix Finishers for Aluminum & Non-Ferrous Alloys)

Cutter Series	Material	SFM	Chip Load Per Tooth (IPT)										Depth of Cut	
			.015	.031	.047	.062	.078	.093	.125	.187	.250		Radial	Axial
Uncoated	Aluminum Alloys: Casting (2xxx, 5xxx, 7xxx, 8xxx)	750	Finishing (3x LOC)	.00027	.00056	.00085	.00112	.00140	.00167	.00225	.00337	.00450	.12x Dia	.5x - 3x Dia
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000												
	Magnesium Alloys: All alloys	1500												
	Zinc Alloys: All alloys	800	Finishing (4x LOC)	.00024	.00049	.00074	.00098	.00123	.00146	.00197	.00295	.00394	.10x Dia	.5x - 4x Dia
	Copper Alloys: High Coppers - 90%+ (C1xxx)	225												
	Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C69800)	500												
	Phosphor Bronzes (Copper Tin alloys, C5xxx)	225	Finishing (5x LOC)	.00020	.00042	.00063	.00084	.00105	.00126	.00169	.00252	.00338	.09x Dia	.5x - 5x Dia
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500												
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500												
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	225	Finishing (8x LOC)	.00015	.00031	.00047	.00061	.00077	.00092	.00124	.00185	.00248	.07x Dia	.5x - 8x Dia
	Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550												
TiB ₂	Aluminum: Casting (2xx, 5xx, 7xx, 8xx)	1000	Finishing (3x LOC)	.00035	.00073	.00110	.00145	.00183	.00218	.00293	.00438	.00585	.12x Dia	.5x - 3x Dia
			Finishing (4x LOC)	.00031	.00063	.00096	.00127	.00160	.00190	.00256	.00383	.00512	.10x Dia	.5x - 4x Dia
	Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1400	Finishing (5x LOC)	.00026	.00054	.00082	.00109	.00137	.00163	.00219	.00328	.00439	.09x Dia	.5x - 5x Dia
	Magnesium Alloys: All alloys	2000	Finishing (8x LOC)	.00019	.00040	.00060	.00080	.00100	.00120	.00161	.00241	.00322	.07x Dia	.5x - 8x Dia
	Zinc Alloys: All alloys	1100	Finishing (10x LOC)	.00018	.00038	.00057	.00075	.00095	.00113	.00152	.00228	.00304	.05x Dia	.5x - 10x Dia

END MILLS FOR PLASTICS

Square Upcut – 2 Flute (Slow Helix)



2 Flute Design Improves
Bottom Finish and Accuracy

- High rake, high relief design with large flute valley maximizes chip removal and performance
- 2 flute design improves rigidity for better accuracy, less deflection, and longer tool life
- Slower helix reduces lifting forces, making design preferable for fiber-reinforced applications and vacuum table setups
- Center cutting design improves plunging and ramping
- Solid carbide
- CNC ground in the USA

mm & in

CUTTER DIAMETER		LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AMORPHOUS DIAMOND	
D ₁ $\begin{smallmatrix} +.000'' \\ -.001'' \end{smallmatrix}$	decimal equivalent	L ₂ $\begin{smallmatrix} +.010'' \\ -.000'' \end{smallmatrix}$	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE
.008	.0080	.024 (3x)	1/8	1-1/2	48608	62.50		
.008	.0080	.040 (5x)	1/8	1-1/2	49808	63.10		
.010	.0010	.030 (3x)	1/8	1-1/2	48610	59.60		
.010	.0010	.050 (5x)	1/8	1-1/2	49810	67.80		
1/64	.0156	.023 (1.5x)	1/8	1-1/2	957615	51.00		
1/64	.0156	3/64 (3x)	1/8	1-1/2	48615	51.00		
1/64	.0156	5/64 (5x)	1/8	1-1/2	49815	59.20		
1/64	.0156	1/8 (8x)	1/8	1-1/2	60215	66.50		
.020	.0200	.030 (1.5x)	1/8	1-1/2	957620	38.90		
.020	.0200	.060 (3x)	1/8	1-1/2	48620	38.90	48620-C4	51.30
.020	.0200	.100 (5x)	1/8	1-1/2	49820	47.30		
.020	.0200	.160 (8x)	1/8	1-1/2	60220	54.60		
.020	.0200	.200 (10x)	1/8	1-1/2	938920	54.60		
.025	.0250	.038 (1.5x)	1/8	1-1/2	957625	38.90		
.025	.0250	.075 (3x)	1/8	1-1/2	48625	38.90		
.025	.0250	1/8 (5x)	1/8	1-1/2	49825	47.10	49825-C4	59.50
.025	.0250	13/64 (8x)	1/8	1-1/2	60225	54.60		
.030	.0300	.090 (3x)	1/8	1-1/2	48630	38.90		
.030	.0300	.156 (5x)	1/8	1-1/2	49830	47.30		
1/32	.0312	3/64 (1.5x)	1/8	1-1/2	957631	38.60		
1/32	.0312	3/32 (3x)	1/8	1-1/2	48631	38.60	48631-C4	51.00
1/32	.0312	3/32 (3x)	1/4	2	878731	47.80		
1/32	.0312	5/32 (5x)	1/8	1-1/2	49831	47.10	49831-C4	59.50
1/32	.0312	1/4 (8x)	1/8	1-1/2	60231	53.90	60231-C4	66.30
1/32	.0312	5/16 (10x)	1/8	1-1/2	938931	53.90		
.035	.0350	.105 (3x)	1/8	1-1/2	48635	38.90		
.039 (1 mm)	.0394	.118 (3x)	1/8	1-1/2	48639	39.10		
.039 (1 mm)	.0394	13/64 (5x)	1/8	1-1/2	49839	39.10		
.040	.0400	.060 (1.5x)	1/8	1-1/2	957640	38.90		
.040	.0400	.120 (3x)	1/8	1-1/2	48640	38.90		
.040	.0400	13/64 (5x)	1/8	1-1/2	49840	47.30		
.040	.0400	.325 (8x)	1/8	2	60240	54.60		
.045	.0450	.135 (3x)	1/8	1-1/2	48645	38.90		
3/64	.0469	.071 (1.5x)	1/8	1-1/2	957647	32.70		
3/64	.0469	9/64 (3x)	1/8	1-1/2	48647	32.70	48647-C4	45.10
3/64	.0469	1/4 (5x)	1/8	1-1/2	49847	38.00	49847-C4	50.40
3/64	.0469	3/8 (8x)	1/8	2	60247	45.60		
.050	.0500	.150 (3x)	1/8	1-1/2	48650	33.00		
.050	.0500	.250 (5x)	1/8	1-1/2	49850	38.30		
.055	.0550	.165 (3x)	1/8	1-1/2	48655	33.00		
.060	.0600	.180 (3x)	1/8	1-1/2	48660	33.00		
.060	.0600	5/16 (5x)	1/8	1-1/2	49860	38.30		

continued on next page

END MILLS FOR PLASTICS

Square Upcut – 2 Flute (Slow Helix) (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AMORPHOUS DIAMOND	
D ₁									
$+.000''$ $-.002''$	$+.00mm$ $-.05mm$	decimal equivalent	L ₂ $+.030''$ $-.000''$ $+.75mm$ $-.00mm$	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE
1/16		.0625	3/32 (1.5x)	1/8	1-1/2	957662	28.70		
1/16		.0625	3/16 (3x)	1/8	1-1/2	48662	28.70	48662-C4	41.10
1/16		.0625	3/16 (3x)	1/4	2	878762	37.90		
1/16		.0625	1/4 (4x)	1/8	2	874862	33.90		
1/16		.0625	5/16 (5x)	1/8	2	49862	33.90	49862-C4	47.50
1/16		.0625	3/8 (6x)	1/8	2	745662	36.50		NEW
1/16		.0625	1/2 (8x)	1/8	2	60262	41.80	60262-C4	55.80
1/16		.0625	5/8 (10x)	1/8	2	938962	41.80		
5/64		.0781	.117 (1.5x)	1/8	1-1/2	957678	28.70		
5/64		.0781	15/64 (3x)	1/8	1-1/2	48678	28.70	48678-C4	41.10
5/64		.0781	13/32 (5x)	1/8	2	49878	33.90	49878-C4	47.50
5/64		.0781	5/8 (8x)	1/8	2	60278	41.80		
5/64		.0781	.800 (10x)	1/8	2	938978	41.80		
3/32		.0937	9/64 (1.5x)	1/8	1-1/2	957693	28.70	957693-C4	41.10
3/32		.0937	9/32 (3x)	1/8	1-1/2	48693	28.70	48693-C4	41.10
3/32		.0937	9/32 (3x)	1/4	2	878793	37.90		
3/32		.0937	3/8 (4x)	1/8	2	874893	33.90		
3/32		.0937	1/2 (5x)	1/8	2	49893	33.90	49893-C4	47.50
3/32		.0937	9/16 (6x)	1/8	2	745693	36.50		NEW
3/32		.0937	3/4 (8x)	1/8	2	60293	41.80	60293-C4	55.80
3/32		.0937	.950 (10x)	1/8	2	938993	41.80		
.100		.1000	.150 (1.5x)	1/8	1-1/2	957700	28.80		
.100		.1000	.300 (3x)	1/8	1-1/2	48700	28.80		
.100		.1000	1/2 (5x)	1/8	2	49900	34.40		
.100		.1000	.800 (8x)	1/8	2-1/2	60300	42.30		
7/64		.1090	21/64 (3x)	1/8	1-1/2	48707	28.80		
.118 (3 mm)		.1181	.177 (1.5x)	1/8	1-1/2	957706	28.80		
.118 (3 mm)		.1181	.354 (3x)	1/8	1-1/2	48706	28.80		
.118 (3 mm)		.1181	.625 (5x)	1/8	2	49906	34.40		
.118 (3 mm)		.1181	.950 (8x)	1/8	2-1/2	60306	42.30		
1/8		.1250	.100 (0.8x)	1/8	1-1/2	793208	28.70		
1/8		.1250	3/16 (1.5x)	1/8	1-1/2	957708	28.70	957708-C4	41.10
1/8		.1250	3/8 (3x)	1/8	1-1/2	48708	28.70	48708-C4	41.10
1/8		.1250	3/8 (3x)	1/4	2	878808	37.90		
1/8		.1250	1/2 (4x)	1/8	2	874908	33.90		
1/8		.1250	5/8 (5x)	1/8	2	49908	33.90	49908-C4	47.50
1/8		.1250	3/4 (6x)	1/8	2-1/2	745708	36.50		NEW
1/8		.1250	1 (8x)	1/8	2-1/2	60308	41.80	60308-C4	54.20
1/8		.1250	1-1/4 (10x)	1/8	2-1/2	939008	41.80	939008-C4	54.20
9/64		.1406	27/64 (3x)	3/16	2	48709	38.00		
9/64		.1406	3/4 (5x)	3/16	3	49909	37.90		
5/32		.1562	15/64 (1.5x)	3/16	2	957710	37.90		
5/32		.1562	15/32 (3x)	3/16	2	48710	37.90	48710-C4	55.00
5/32		.1562	3/4 (5x)	3/16	3	49910	46.70	49910-C4	63.80
5/32		.1562	1-1/4 (8x)	3/16	3	60310	51.30		
3/16		.1875	9/32 (1.5x)	3/16	2	957712	37.90	957712-C4	55.00
3/16		.1875	9/16 (3x)	3/16	2	48712	37.90	48712-C4	55.00
3/16		.1875	9/16 (3x)	1/4	2	878812	47.10		

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END MILLS FOR PLASTICS

Square Upcut – 2 Flute (Slow Helix) (cont.)



continued from previous page

CUTTER DIAMETER			LENGTH OF CUT	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AMORPHOUS DIAMOND	
D ₁		decimal equivalent	L ₂	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE
+.000" -.002"	+.00mm -.05mm		+.030" -.000" +.75mm -.00mm						
3/16		.1875	3/4 (4x)	3/16	3	874912	46.70		
3/16		.1875	1 (5x)	3/16	3	49912	46.70	49912-C4	63.80
3/16		.1875	1-1/2 (8x)	3/16	3	60312	51.30		
3/16		.1875	1-7/8 (10x)	3/16	3	939012	51.30		
6.0 mm		.2362	18 mm (3x)	6 mm	63 mm	886566	74.60		
1/4		.2500	.200 (0.8x)	1/4	2-1/2	793216	46.70		
1/4		.2500	3/8 (1.5x)	1/4	2-1/2	957716	46.70	957716-C4	66.10
1/4		.2500	3/4 (3x)	1/4	2-1/2	48716	46.70	48716-C4	66.10
1/4		.2500	1 (4x)	1/4	3	874916	53.50		
1/4		.2500	1-1/4 (5x)	1/4	3	49916	53.50	49916-C4	72.90
1/4		.2500	2 (8x)	1/4	4	60316	66.90	60316-C4	86.30
1/4		.2500	2-1/2 (10x)	1/4	4	939016	66.90		
5/16		.3125	15/32 (1.5x)	5/16	2-1/2	957720	69.50		
5/16		.3125	1 (3x)	5/16	2-1/2	48720	69.50		
5/16		.3125	1-5/8 (5x)	5/16	4	49920	89.80		
8.0 mm		.3149	24 mm (3x)	8 mm	63 mm	886570	99.90		
3/8		.3750	9/16 (1.5x)	3/8	3	957724	80.20	957724-C4	103.60
3/8		.3750	1-1/8 (3x)	3/8	3	48724	80.20	48724-C4	103.60
3/8		.3750	1-1/2 (4x)	3/8	4	874924	92.50		
3/8		.3750	2 (5x)	3/8	4	49924	92.50		
3/8		.3750	3 (8x)	3/8	6	60324	104.40		
10.0 mm		.3937	30 mm (3x)	10 mm	75 mm	886573	89.50		
12.0 mm		.4724	36 mm (3x)	12 mm	100 mm	886576	93.00		
1/2		.5000	3/4 (1.5x)	1/2	4	957732	141.20	957732-C4	169.30
1/2		.5000	1-1/2 (3x)	1/2	4	48732	141.20	48732-C4	169.30
1/2		.5000	2 (4x)	1/2	4	874932	152.70		
1/2		.5000	2-5/8 (5x)	1/2	5	49932	168.10	49932-C4	196.60
1/2		.5000	4 (8x)	1/2	7	60332	193.50		
5/8		.6250	15/16 (1.5x)	5/8	4	957740	204.10		
3/4		.7500	1-1/8 (1.5x)	3/4	4	957748	265.70		
3/4		.7500	2-1/4 (3x)	3/4	4	48748	265.70		

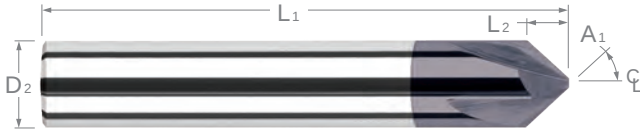
SPEEDS & FEEDS (2 Flute Plastic Cutting End Mills - Slow Helix)

Important Note: Values are in inches and are based on standard (3x Dia) length of cut end mills. For shorter lengths of cut, table values of IPT must be increased (for 0.8x, increase 120%; for 1.5x, increase 115%). For longer lengths of cuts, table values of IPT must be reduced (for 4x, reduce to 95%; for 5x, reduce to 90%; for 6x, reduce to 80%; for 8x, reduce to 54%; for 10x, reduce to 40%).

Material Type		SFM	Chip Load Per Tooth (IPT) By Cutter Diameter															Depth of Cut	
				.015	.031	.047	.062	.078	.093	.125	.187	.250	.312	.375	.500	.625	.750	Radial	Axial
Unfilled	Unfilled	800-1200	Slot - Rough	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0060	.0080	.0085	.0103	.0137	.0171	.0205	1 x Dia	1 x Dia
			Profile	.0006	.0011	.0017	.0023	.0029	.0034	.0046	.0069	.0093	.0098	.0118	.0157	.0197	.0236	.35 x Dia	1 x Dia
Filled Plastics	Carbon/Glass Filled 5% < 20%	600-800	Slot - Rough	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0060	.0080	.0085	.0103	.0137	.0171	.0205	1 x Dia	1 x Dia
			Profile	.0006	.0011	.0017	.0023	.0029	.0034	.0046	.0069	.0093	.0098	.0118	.0157	.0197	.0236	.35 x Dia	1 x Dia
	Carbon/Glass Filled 21% < 40%	500-700	Slot - Rough	.0004	.0008	.0012	.0016	.0021	.0024	.0033	.0049	.0066	.0070	.0084	.0112	.0140	.0168	1 x Dia	1 x Dia
			Profile	.0005	.0009	.0014	.0019	.0024	.0028	.0038	.0057	.0076	.0080	.0096	.0129	.0161	.0193	.35 x Dia	1 x Dia
Fiber Reinforced	Carbon/Glass Fiber 5% < 20%	500-700	Slot - Rough	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0060	.0080	.0085	.0103	.0137	.0171	.0205	1 x Dia	1 x Dia
			Profile	.0006	.0011	.0017	.0023	.0029	.0034	.0046	.0069	.0093	.0098	.0118	.0157	.0197	.0236	.35 x Dia	1 x Dia
	Carbon/Glass Fiber 21% < 40%	300-400	Slot - Rough	.0004	.0008	.0012	.0016	.0021	.0024	.0033	.0049	.0066	.0070	.0084	.0112	.0140	.0168	1 x Dia	1 x Dia
			Profile	.0005	.0009	.0014	.0019	.0024	.0028	.0038	.0057	.0076	.0080	.0096	.0129	.0161	.0193	.35 x Dia	1 x Dia

CHAMFER CUTTERS

Pointed & Flat End

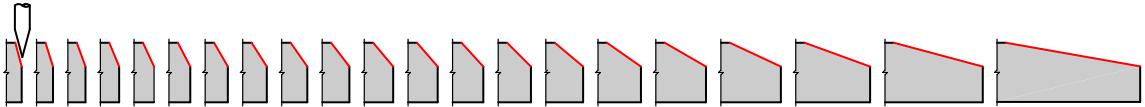


Available in
2, 3, 4 & 6
Flutes!

Choose from three types:

- **Pointed** (Type I): 2 flute style for deburring and chamfering in narrow grooves, slots and small holes
- **Flat End** (Type II): (non-cutting) multi-flute design improves tool life and finish for profiling and chamfering larger features
- **End Cutting** (Type III): 4 flute center cutting geometry to blend the floor and a chamfered wall in a single pass

Solid carbide CNC ground in the USA



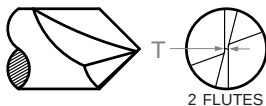
Stocked in 21 Angles Per Side, Ranging from 15°-80°!

ANGLE PER SIDE	DIA. FLUTES TIP TYPE LOC OAL						UNCOATED		A1TiN COATED		TiB ₂ COATED	
A ₁ ^{+0°30'} -0°30'	D ₂	T _(MAX.)		L ₂	L _{4 (MAX.)}	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
15°	1/8	2	.010	I	.233	1-1/2	18715	18.70	18715-C3	23.60	18715-C8	25.90
	1/8	2	.010	I	.233	3 <i>LONG!</i>	50615	23.60	50615-C3	28.50		
	1/8	3	.040	II	.159	.075 1-1/2	968615	19.70	968615-C3	24.60		
	1/8	4	.040	II	.159	.075 1-1/2	866115	20.70	866115-C3	25.60		
	3/16	2	.010	I	.350	2	72415	25.60	72415-C3	30.90		
	3/16	2	.010	I	.350	4 <i>LONG!</i>	986915	37.90	986915-C3	45.10		
	3/16	3	.040	II	.275	.075 2	978115	29.20	978115-C3	34.50		
	3/16	4	.040	II	.275	.075 2	848715	30.60	848715-C3	35.90		
	1/4	2	.010	I	.448	2-1/2	47615	36.70	47615-C3	43.90	47615-C8	44.40
	1/4	3	.060	II	.355	.112 2-1/2	18515	34.80	18515-C3	42.00		
	1/4	3	.060	II	.355	.112 4 <i>LONG!</i>	48515	47.00	48515-C3	51.50		
	1/4	4	.060	II	.355	.112 2-1/2	876415	38.50	876415-C3	45.70		
	1/4	4	.040	III	.391	.075 2-1/2	833115	40.50	833115-C3	47.70		
	5/16	3	.060	II	.471	.112 2-1/2	977015	43.20	977015-C3	51.60		
	3/8	2	.010	I	.700	2-1/2	72515	49.20	72515-C3	58.70		
	3/8	3	.060	II	.588	.112 2-1/2	18415	46.70	18415-C3	56.20	18415-C8	66.60
	3/8	3	.060	II	.588	.112 4 <i>LONG!</i>	981215	71.00	981215-C3	84.00		
	3/8	4	.060	II	.588	.112 2-1/2	895115	51.70	895115-C3	61.20		
	1/2	2	.010	I	.933	3	960415	82.80	960415-C3	97.00		
	1/2	4	.080	II	.784	.149 3	18315	69.30	18315-C3	83.50		
	1/2	6	.080	II	.784	.149 3	839215	76.80	839215-C3	91.00		
	5/8	6	.080	II	1.017	.149 3-1/2	952815	120.60	952815-C3	134.80		
	3/4	6	.100	II	1.213	.187 4	949315	180.60	949315-C3	196.00		

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TYPE I - POINTED

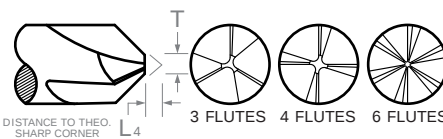
Flat relief ground to center, yielding a web thickness at tip (T)



2 FLUTES

TYPE II - FLAT END

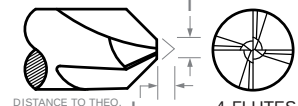
Flat relief ground to a non-end cutting flat tip (T)



3 FLUTES 4 FLUTES 6 FLUTES

TYPE III - END CUTTING

Flat relief ground to an end cutting tip diameter (T), two flutes to center



4 FLUTES

CHAMFER CUTTERS

Pointed & Flat End (cont.)

continued from previous page

ANGLE PER SIDE	DIA.	FLUTES	TIP	TYPE	LOC	OAL	UNCOATED		AItIN COATED		TiB ₂ COATED	
A ₁ ^{+0°30'} -0°30'	D ₂		T (MAX.)		L ₂	L ₄ (MAX.) L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
17.5°	1/8	2	.010	I	.198	1-1/2	18718	21.60	18718-C3	26.50		
	1/4	2	.010	I	.396	2-1/2	47618	39.30	47618-C3	46.50		
	1/4	3	.060	II	.301	.095 2-1/2	18518	39.30	18518-C3	46.50		
	3/8	3	.060	II	.500	.107 2-1/2	18418	51.20	18418-C3	60.70		NEW
	1/2	4	.080	II	.666	.127 3	18318	78.40	18318-C3	92.60		
20°	1/8	2	.010	I	.172	1-1/2	18720	18.70	18720-C3	23.60	18720-C8	25.90
	1/8	2	.010	I	.172	3 LONG!	50620	23.60	50620-C3	28.50		
	1/8	3	.040	II	.117	.055 1-1/2	968620	19.70	968620-C3	24.60		
	1/8	4	.040	II	.117	.055 1-1/2	866120	20.70	866120-C3	25.60		
	3/16	2	.010	I	.258	2	72420	25.60	72420-C3	30.90	72420-C8	32.80 NEW
	3/16	2	.010	I	.258	4 LONG!	986920	37.90	986920-C3	45.10		
	3/16	3	.040	II	.203	.055 2	978120	29.20	978120-C3	34.50		
	3/16	4	.040	II	.203	.055 2	848720	30.60	848720-C3	35.90		
	1/4	2	.010	I	.343	2-1/2	47620	36.70	47620-C3	43.90	47620-C8	44.40
	1/4	3	.060	II	.261	.082 2-1/2	18520	34.80	18520-C3	42.00	18520-C8	42.50
	1/4	3	.060	II	.261	.082 4 LONG!	48520	47.00	48520-C3	51.50		
	1/4	4	.060	II	.261	.082 2-1/2	876420	41.00	876420-C3	48.20		
	1/4	4	.040	III	.288	.055 2-1/2	833120	42.60	833120-C3	49.80		
	5/16	3	.060	II	.347	.082 2-1/2	977020	49.20	977020-C3	57.60		
	3/8	2	.010	I	.515	2-1/2	72520	49.20	72520-C3	58.70		
	3/8	3	.060	II	.433	.082 2-1/2	18420	46.70	18420-C3	56.20		
	3/8	3	.060	II	.433	.082 4 LONG!	981220	71.00	981220-C3	84.00		
	3/8	4	.060	II	.433	.082 2-1/2	895120	55.00	895120-C3	64.50		
	1/2	2	.010	I	.687	3	960420	82.80	960420-C3	97.00		
	1/2	4	.080	II	.577	.110 3	18320	69.30	18320-C3	83.50		
	1/2	6	.080	II	.577	.110 3	839220	76.80	839220-C3	91.00		
22.5°	1/8	2	.010	I	.151	1-1/2	18723	20.90	18723-C3	25.80	18723-C8	28.10
	1/8	3	.040	II	.103	.048 1-1/2	968623	20.90	968623-C3	25.80		
	3/16	2	.010	I	.226	2	72423	27.40	72423-C3	32.70		
	3/16	3	.040	II	.178	.048 2	978123	27.40	978123-C3	32.70		
	1/4	2	.010	I	.302	2-1/2	47623	39.30	47623-C3	46.50		
	1/4	3	.060	II	.229	.072 2-1/2	18523	39.30	18523-C3	46.50		
	3/8	2	.010	I	.453	2-1/2	72523	52.80	72523-C3	62.30		
	3/8	3	.060	II	.380	.072 2-1/2	18423	52.80	18423-C3	62.30		
	1/2	2	.010	I	.604	3	960423	84.00	960423-C3	98.20		
	1/2	4	.080	II	.507	.097 3	18323	74.30	18323-C3	88.50		
25°	1/8	2	.010	I	.134	1-1/2	18725	20.90	18725-C3	25.80	18725-C8	28.10
	1/8	3	.040	II	.091	.043 1-1/2	968625	20.90	968625-C3	25.80		
	3/16	2	.010	I	.201	2	72425	27.20	72425-C3	32.50		
	3/16	3	.040	II	.158	.043 2	978125	27.20	978125-C3	32.50		
	1/4	2	.010	I	.268	2-1/2	47625	39.30	47625-C3	46.50		
	1/4	3	.060	II	.204	.064 2-1/2	18525	39.10	18525-C3	46.30		
	1/4	4	.060	II	.204	.064 2-1/2	876425	40.80	876425-C3	48.00		
	3/8	2	.010	I	.402	2-1/2	72525	52.40	72525-C3	61.90		
	3/8	3	.060	II	.338	.064 2-1/2	18425	52.40	18425-C3	61.90		
	1/2	2	.010	I	.536	3	960425	83.20	960425-C3	97.40		
	1/2	4	.080	II	.450	.086 3	18325	73.40	18325-C3	87.60		

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CHAMFER CUTTERS

Pointed & Flat End (cont.)

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ANGLE PER SIDE	DIA.	FLUTES	TIP	TYPE	LOC	OAL	UNCOATED		AITiN COATED		TiB ₂ COATED	
A ₁ +0°30' -0°30'	D ₂		T (MAX.)		L ₂	L ₄ (MAX.) L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
27.5°	1/8	2	.010	I	.120	1-1/2	18728	21.60	18728-C3	26.50		
	1/4	2	.010	I	.240	2-1/2	47628	39.30	47628-C3	46.50		
	1/4	3	.060	II	.182	.058 2-1/2	18528	39.30	18528-C3	46.50		
	1/2	4	.080	II	.403	.077 3	18328	74.30	18328-C3	88.50		
30°	3 mm	2	.120 mm	I	2.60 mm	38 mm	900230	20.70	900230-C3	25.60		
	1/8	2	.010	I	.108	1-1/2	18730	18.70	18730-C3	23.60	18730-C8	25.90
	1/8	2	.010	I	.108	3 LONG!	50630	23.60	50630-C3	28.50		
	1/8	3	.040	II	.074	.035 1-1/2	968630	19.70	968630-C3	24.60		
	1/8	4	.040	II	.074	.035 1-1/2	866130	20.70	866130-C3	25.60		
	1/8	4	.040	III	.074	.035 1-1/2	802830	22.70	802830-C3	27.60		
	3/16	2	.010	I	.162	2	72430	25.60	72430-C3	30.90	72430-C8	32.80
	3/16	2	.010	I	.162	4 LONG!	986930	37.90	986930-C3	45.10		
	3/16	3	.040	II	.128	.035 2	978130	31.80	978130-C3	37.10		
	3/16	4	.040	II	.128	.035 2	848730	33.20	848730-C3	38.50		
	1/4	2	.010	I	.217	2-1/2	47630	36.70	47630-C3	43.90	47630-C8	44.40
	1/4	3	.060	II	.165	.052 2-1/2	18530	34.80	18530-C3	42.00	18530-C8	42.50
	1/4	3	.060	II	.165	.052 4 LONG!	48530	47.00	48530-C3	51.50		
	1/4	4	.060	II	.165	.052 2-1/2	876430	38.50	876430-C3	45.70		
	1/4	4	.040	III	.181	.035 2-1/2	833130	40.60	833130-C3	47.80		
	5/16	2	.010	I	.271	2-1/2	880330	44.40	880330-C3	52.80		
	5/16	3	.060	II	.219	.052 2-1/2	977030	43.20	977030-C3	51.60		
	5/16	4	.060	II	.219	.052 2-1/2	873230	46.00	873230-C3	54.40		
	3/8	2	.010	I	.325	2-1/2	72530	49.20	72530-C3	58.70		
	3/8	3	.060	II	.273	.052 2-1/2	18430	46.70	18430-C3	56.20	18430-C8	66.60
	3/8	3	.060	II	.273	.052 4 LONG!	981230	71.00	981230-C3	84.00		
	3/8	4	.060	II	.273	.052 2-1/2	895130	51.70	895130-C3	61.20		
	3/8	4	.060	III	.273	.052 2-1/2	827830	54.20	827830-C3	63.70		
	1/2	2	.010	I	.433	3	960430	78.20	960430-C3	92.40		
	1/2	3	.080	II	.364	.069 3	871830	77.00	871830-C3	91.20		
	1/2	4	.080	II	.364	.069 3	18330	65.40	18330-C3	79.60	18330-C8	88.80
	1/2	4	.080	III	.364	.069 3	820230	70.60	820230-C3	84.80		
	1/2	6	.080	II	.364	.069 3	839230	72.40	839230-C3	86.60		
	5/8	6	.080	II	.472	.069 3-1/2	952830	120.60	952830-C3	134.80		
	3/4	6	.100	II	.563	.087 4	949330	180.60	949330-C3	196.00		
32.5°	1/8	2	.010	I	.098	1-1/2	18733	21.60	18733-C3	26.50		
	1/4	3	.060	II	.149	.047 2-1/2	18533	39.30	18533-C3	46.50		
	1/2	4	.080	II	.330	.063 3	18333	74.30	18333-C3	88.50		
35°	1/8	2	.010	I	.089	1-1/2	18735	20.20	18735-C3	25.10		
	1/8	3	.040	II	.061	.029 1-1/2	968635	20.20	968635-C3	25.10		
	3/16	2	.010	I	.134	2	72435	26.10	72435-C3	31.40		
	3/16	3	.040	II	.105	.029 2	978135	26.10	978135-C3	31.40		
	1/4	2	.010	I	.179	2-1/2	47635	47.70	47635-C3	54.90		
	1/4	3	.060	II	.136	.043 2-1/2	18535	37.50	18535-C3	44.70		
	3/8	2	.010	I	.268	2-1/2	72535	50.50	72535-C3	60.00		
	3/8	3	.060	II	.225	.043 2-1/2	18435	50.50	18435-C3	60.00		
	1/2	2	.010	I	.357	3	960435	80.10	960435-C3	94.30		
	1/2	4	.080	II	.300	.057 3	18335	70.60	18335-C3	84.80		

CHAMFER CUTTERS

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CHAMFER CUTTERS

Pointed & Flat End (cont.)

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ANGLE PER SIDE	DIA.	FLUTES	TIP	TYPE	LOC		OAL	UNCOATED		AITIN COATED		TiB ₂ COATED	
A ₁ ^{+0°30'} -0°30'	D ₂		T _(MAX.)		L ₂	L ₄ (MAX.)	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
37.5°	1/8	2	.010	I	.081		1-1/2	18738	21.60	18738-C3	26.50		
	1/4	2	.010	I	.163		2-1/2	47638	50.00	47638-C3	57.20		
	1/4	3	.060	II	.124	.039	2-1/2	18538	39.30	18538-C3	46.50		
	1/2	4	.080	II	.274	.052	3	18338	74.30	18338-C3	88.50		
40°	1/8	2	.010	I	.074		1-1/2	18740	20.20	18740-C3	25.10		
	1/8	3	.040	II	.051	.024	1-1/2	968640	19.70	968640-C3	24.60		
	1/8	4	.040	II	.051	.024	1-1/2	866140	20.70	866140-C3	25.60		
	3/16	2	.010	I	.112		2	72440	26.10	72440-C3	31.40		
	1/4	2	.010	I	.149		2-1/2	47640	47.70	47640-C3	54.90		
	1/4	3	.060	II	.113	.036	2-1/2	18540	37.50	18540-C3	44.70		
	1/4	4	.040	III	.125		2-1/2	833140	46.40	833140-C3	53.60		
	1/4	4	.060	II	.113	.036	2-1/2	876440	40.70	876440-C3	47.90		
	3/8	3	.060	II	.188	.036	2-1/2	18440	50.50	18440-C3	60.00		
1/2	4	.080	II	.25	.048	3	18340	70.60	18340-C3	84.80			
41°	1/8	2	.010	I	.072		1-1/2	18741	19.70	18741-C3	24.60	18741-C8	26.90
	1/8	3	.040	II	.049	.023	1-1/2	968641	22.20	968641-C3	27.10		
	3/16	2	.010	I	.108		2	72441	28.70	72441-C3	34.00		
	3/16	3	.040	II	.085	.023	2	978141	27.60	978141-C3	32.90		
	1/4	2	.010	I	.144		2-1/2	47641	40.70	47641-C3	47.90		
	1/4	3	.060	II	.109	.035	2-1/2	18541	36.90	18541-C3	44.10		
	3/8	2	.010	I	.216		2-1/2	72541	55.60	72541-C3	65.10		
	3/8	3	.060	II	.181	.035	2-1/2	18441	55.60	18441-C3	65.10		
	1/2	2	.010	I	.288		3	960441	84.00	960441-C3	98.20		
1/2	4	.080	II	.242	.046	3	18341	69.30	18341-C3	83.50			
42.5°	1/8	2	.010	I	.068		1-1/2	18743	21.60	18743-C3	26.50		
	1/4	3	.060	II	.104	.033	2-1/2	18543	39.30	18543-C3	46.50		
	1/2	4	.080	II	.229	.044	3	18343	74.30	18343-C3	88.50		
45°	3 mm	2	.25 mm	I	1.50 mm		38 mm	900245	22.50	900245-C3	27.40		
	3 mm	3	1.00 mm	II	1.00 mm	.500 mm	38 mm	899545	22.50	899545-C3	27.40		
	3 mm	4	1.00 mm	III	1.00 mm	.500 mm	38 mm	764845	24.10	764845-C3	29.00		
	1/8	2	.010	I	.063		1-1/2	18745	18.70	18745-C3	23.60	18745-C8	25.90
	1/8	2	.010	I	.063		3	50645	23.60	50645-C3	28.50	50645-C8	30.80
	1/8	3	.040	II	.043	.020	1-1/2	968645	19.70	968645-C3	24.60	968645-C8	26.90
	1/8	3	.040	II	.043	.020	3	790245	24.20	790245-C3	29.10		
	1/8	4	.040	II	.043	.020	1-1/2	866145	20.70	866145-C3	25.60		
	1/8	4	.040	III	.042	.020	1-1/2	802845	22.30	802845-C3	27.20		
	4 mm	2	.25 mm	I	2.00 mm		50 mm	878445	28.70	878445-C3	34.00		
	4 mm	3	1.00 mm	II	1.50 mm	.500 mm	50 mm	863845	28.70	863845-C3	34.00		
	3/16	2	.010	I	.094		2	72445	26.40	72445-C3	31.70	72445-C8	33.60
	3/16	2	.010	I	.094		4	986945	37.90	986945-C3	45.10		
	3/16	3	.040	II	.074	.020	2	978145	31.80	978145-C3	37.10	978145-C8	39.00
	3/16	3	.040	II	.074	.020	3	790945	31.80	790945-C3	37.10		
	3/16	4	.040	II	.074	.020	2	848745	33.20	848745-C3	38.50		
	3/16	4	.040	III	.073	.020	2	809745	34.80	809745-C3	40.10		
	6 mm	2	.25 mm	I	3.00 mm		63 mm	840045	39.90	840045-C3	47.10	840045-C8	47.60
	6 mm	3	1.50 mm	II	2.25 mm	.750 mm	63 mm	837745	39.90	837745-C3	47.10		
	6 mm	4	1.50 mm	II	2.25 mm	.750 mm	63 mm	777645	41.30	777645-C3	48.50		
6 mm	4	1.50 mm	III	2.25 mm	.750 mm	63 mm	764545	44.50	764545-C3	51.70			

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CHAMFER CUTTERS

Pointed & Flat End (cont.)

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ANGLE PER SIDE							UNCOATED		AiTIN COATED		TiB ₂ COATED				
	DIA.	FLUTES	TIP	TYPE	LOC		OAL		TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE	
A ₁ ^{+0°30'} -0°30'	D ₂		T _(MAX.)		L ₂	L ₄ (MAX.)	L ₁			TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
NEW	45°	1/4	2	.010	I	.125	2-1/2		47645	36.70	47645-C3	43.90	47645-C8	44.40	
		1/4	2	.010	I	.125		4 LONG!	790345	46.60	790345-C3	55.00			
		1/4	3	.060	II	.095	.030	2-1/2	18545	35.00	18545-C3	42.20	18545-C8	42.70	
		1/4	3	.060	II	.095	.030	4 LONG!	48545	47.00	48545-C3	51.50			
		1/4	4	.060	II	.095	.030	2-1/2	876445	43.20	876445-C3	50.40	876445-C8	50.90	
		1/4	4	.060	II	.095	.030	4 LONG!	771545	54.80	771545-C3	63.20			
		1/4	4	.040	III	.105	.020	2-1/2	833145	46.40	833145-C3	53.60	833145-C8	54.10	
		1/4	4	.060	III	.095	.030	2-1/2	794145	46.40	794145-C3	53.60			
		5/16	2	.010	I	.156		2-1/2	880345	43.20	880345-C3	51.60			
		5/16	3	.060	II	.126	.030	2-1/2	977045	43.20	977045-C3	51.60			
		5/16	4	.060	II	.126	.030	2-1/2	873245	46.00	873245-C3	54.40			
		5/16	4	.060	III	.126	.030	2-1/2	777545	48.40	777545-C3	56.80			
		8 mm	3	1.50 mm	II	3.25 mm	.750 mm	63 mm	868845	52.80	868845-C3	61.20			
		3/8	2	.010	I	.188		2-1/2	72545	50.50	72545-C3	60.00	72545-C8	70.40	
		3/8	2	.010	I	.188		4 LONG!	791745	72.30	791745-C3	85.30			
		3/8	3	.060	II	.158	.030	2-1/2	18445	46.70	18445-C3	56.20	18445-C8	66.60	
		3/8	3	.060	II	.158	.030	4 LONG!	981245	71.00	981245-C3	84.00			
		3/8	4	.060	II	.158	.030	2-1/2	895145	53.70	895145-C3	63.20			
		3/8	4	.040	III	.167	.020	2-1/2	764245	56.50	764245-C3	66.00			
		3/8	4	.060	III	.158	.030	2-1/2	827845	56.50	827845-C3	66.00			
		10 mm	4	1.50 mm	II	4.25 mm	.750 mm	75 mm	871045	82.60	871045-C3	96.80			
		12 mm	4	1.50 mm	II	5.25 mm	.750 mm	75 mm	881245	82.60	881245-C3	96.80			
		1/2	2	.010	I	.250		3	960445	78.20	960445-C3	92.40	960445-C8	101.60	
		1/2	3	.080	II	.210	.040	3	871845	77.00	871845-C3	91.20			
		1/2	4	.080	II	.210	.040	3	18345	65.40	18345-C3	79.60	18345-C8	88.80	
		1/2	4	.080	II	.210	.040	6 LONG!	982445	118.90	982445-C3	133.10			
		1/2	4	.080	III	.210	.040	3	820245	70.60	820245-C3	84.80			
		1/2	6	.080	II	.210	.040	3	839245	72.40	839245-C3	86.60			
		5/8	4	.080	II	.273	.040	3-1/2	763645	114.60	763645-C3	128.80			
		5/8	4	.080	III	.273	.040	3-1/2	765445	115.90	765445-C3	130.10			
		5/8	6	.080	II	.273	.040	3-1/2	952845	120.60	952845-C3	134.80			
		3/4	4	.100	II	.325	.050	4	764045	173.60	764045-C3	189.00			
		3/4	4	.100	III	.325	.050	4	765145	174.90	765145-C3	190.30			
		3/4	6	.100	II	.325	.050	4	949345	180.60	949345-C3	196.00			
		1	6	.120	II	.440	.060	4	884745	320.70	884745-C3	344.10			
NEW	50°	1/8	2	.010	I	.052	1-1/2		18750	20.20	18750-C3	25.10	18750-C8	27.40	
		1/8	3	.040	II	.036	.017	1-1/2	968650	20.20	968650-C3	25.10			
		3/16	2	.010	I	.079		2	72450	26.10	72450-C3	31.40			
		3/16	3	.040	II	.062	.017	2	978150	32.40	978150-C3	37.70			
		1/4	2	.010	I	.105		2-1/2	47650	37.50	47650-C3	44.70			
		1/4	3	.060	II	.080	.025	2-1/2	18550	37.50	18550-C3	44.70			
		1/4	4	.060	II	.080	.025	2-1/2	876450	40.70	876450-C3	47.90			
		1/4	4	.040	III	.088	.017	2-1/2	833150	46.40	833150-C3	53.60			
		3/8	2	.010	I	.157		2-1/2	72550	50.50	72550-C3	60.00	72550-C8	70.40	
		3/8	3	.060	II	.132	.025	2-1/2	18450	50.50	18450-C3	60.00			
		3/8	4	.060	II	.132	.025	2-1/2	895150	53.60	895150-C3	63.10			
		1/2	2	.010	I	.210		3	960450	80.10	960450-C3	94.30			
		1/2	4	.080	II	.176	.034	3	18350	70.60	18350-C3	84.80			

continued on next page

CHAMFER CUTTERS

Pointed & Flat End (cont.)

continued from previous page

ANGLE PER SIDE	DIA.	FLUTES	TIP	TYPE	LOC		OAL		UNCOATED		AITIN COATED		TiB ₂ COATED	
									TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
A ₁ ^{+0°30'} -0°30'	D ₂		T (MAX.)		L ₂	L ₄ (MAX.)	L ₁							
55°	1/8	2	.010	I	.044		1-1/2		18755	22.20	18755-C3	27.10		
	3/16	2	.010	I	.066		2		72455	27.40	72455-C3	32.70		
	1/4	2	.010	I	.088		2-1/2		47655	52.00	47655-C3	59.20		
	1/4	3	.060	II	.067	.021	2-1/2		18555	40.70	18555-C3	47.90		
	3/8	3	.060	II	.110	.021	2-1/2		18455	52.80	18455-C3	62.30		
	1/2	4	.080	II	.147	.028	3		18355	76.30	18355-C3	90.50		
60°	3 mm	2	.120 mm	I	.87 mm		38 mm		900260	20.00	900260-C3	24.90		
	1/8	2	.010	I	.036		1-1/2		18760	18.70	18760-C3	23.60	18760-C8	25.90
	1/8	2	.010	I	.036		3	LONG!	50660	23.60	50660-C3	28.50		
	1/8	3	.040	II	.025	.012	1-1/2		968660	19.70	968660-C3	24.60		
	3/16	2	.010	I	.054		2		72460	25.60	72460-C3	30.90		
	3/16	3	.040	II	.043	.012	2		978160	31.80	978160-C3	37.10		
	1/4	2	.010	I	.072		2-1/2		47660	36.70	47660-C3	43.90		
	1/4	3	.060	II	.055	.017	2-1/2		18560	34.80	18560-C3	42.00		
	1/4	3	.060	II	.055	.017	4	LONG!	48560	47.00	48560-C3	51.50		
	1/4	4	.060	II	.055	.017	2-1/2		876460	38.50	876460-C3	45.70		
	1/4	4	.040	III	.060	.012	2-1/2		833160	40.20	833160-C3	47.40		
	5/16	3	.060	II	.073	.017	2-1/2		977060	43.20	977060-C3	51.60		
	3/8	2	.010	I	.108		2-1/2		72560	49.20	72560-C3	58.70		
	3/8	3	.060	II	.091	.017	2-1/2		18460	46.70	18460-C3	56.20	18460-C8	66.60
	3/8	4	.060	II	.091	.017	2-1/2		895160	50.60	895160-C3	60.10		
	3/8	4	.060	III	.091	.017	2-1/2		827860	56.50	827860-C3	66.00		
	1/2	2	.010	I	.144		3		960460	78.20	960460-C3	92.40		
	1/2	4	.080	II	.121	.023	3		18360	65.40	18360-C3	79.60		
	1/2	4	.080	III	.121	.023	3		820260	69.50	820260-C3	83.70		
	5/8	6	.080	II	.157	.023	3-1/2		952860	120.60	952860-C3	134.80		
	3/4	6	.100	II	.188	.029	4		949360	180.60	949360-C3	196.00		
65°	1/8	2	.010	I	.029		1-1/2		18765	20.90	18765-C3	25.80		
	3/16	2	.010	I	.044		2		72465	27.40	72465-C3	32.70		
	1/4	2	.010	I	.058		2-1/2		47665	50.00	47665-C3	57.20		
	1/4	3	.060	II	.044	.014	2-1/2		18565	39.30	18565-C3	46.50		
	3/8	3	.060	II	.073	.014	2-1/2		18465	52.80	18465-C3	62.30		
	1/2	4	.080	II	.098	.019	3		18365	74.30	18365-C3	88.50		
70°	1/8	2	.010	I	.023		1-1/2		18770	20.20	18770-C3	25.10		
	3/16	2	.010	I	.034		2		72470	26.10	72470-C3	31.40		
	1/4	2	.010	I	.045		2-1/2		47670	47.70	47670-C3	54.90		
	1/4	3	.060	II	.035	.011	2-1/2		18570	37.50	18570-C3	44.70		
	3/8	3	.060	II	.057	.011	2-1/2		18470	54.40	18470-C3	63.90		
	1/2	4	.080	II	.076	.015	3		18370	70.60	18370-C3	84.80		

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CHAMFER CUTTERS

Pointed & Flat End (cont.)

continued from previous page

ANGLE PER SIDE	DIA. FLUTES TIP TYPE LOC OAL							UNCOATED		A1TiN COATED		TiB2 COATED	
A1 ^{+0°30'} -0°30'	D2	T (MAX.)			L2	L4 (MAX.)	L1	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
75°	1/8	2	.010	I	.017		1-1/2	18775	22.20	18775-C3	27.10	18775-C8	29.40
	1/8	3	.040	II	.011	.005	1-1/2	968675	22.20	968675-C3	27.10		
	3/16	2	.010	I	.025		2	72475	28.70	72475-C3	34.00		
	3/16	3	.040	II	.020	.005	2	978175	33.90	978175-C3	38.60		
	1/4	2	.010	I	.033		2-1/2	47675	40.70	47675-C3	47.90		
	1/4	3	.060	II	.025	.008	2-1/2	18575	41.40	18575-C3	48.60		
	1/4	4	.060	II	.025	.008	2-1/2	876475	44.60	876475-C3	51.80		
	3/8	2	.010	I	.050		2-1/2	72575	55.60	72575-C3	65.10		
	3/8	3	.060	II	.042	.008	2-1/2	18475	55.60	18475-C3	65.10		
	1/2	2	.010	I	.067		3	960475	88.20	960475-C3	102.40		
	1/2	4	.080	II	.056	.011	3	18375	77.90	18375-C3	92.10		
80°	1/8	2	.010	I	.011		1-1/2	18780	22.00	18780-C3	26.90		
	1/4	3	.060	II	.017	.005	2-1/2	18580	29.80	18580-C3	37.00		
	1/2	4	.080	II	.037	.007	3	18380	92.20	18380-C3	106.40		

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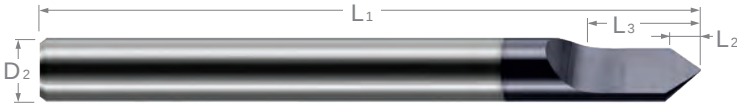


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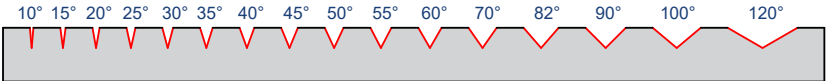
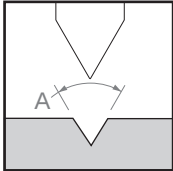


ENGRAVING CUTTERS

Pointed



- Ground to a point
- Half-round drill style
- Relieved for right hand milling
- Solid carbide
- CNC ground in the USA

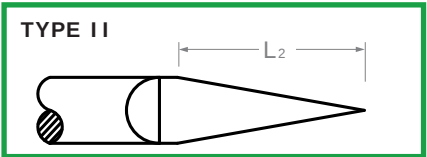
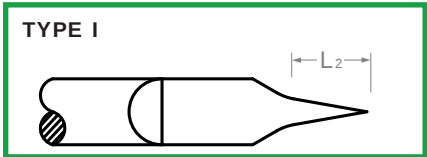


Stocked in *Sixteen* Included Angles!

mm & in

INCL. ANGLE	DIA.	LENGTH OF CUT	TYPE	SPLIT LENGTH	OVERALL LENGTH	UNCOATED		AItIN COATED		AMORPHOUS DIAMOND	
						TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
A	D ₂	L ₂		L ₃	L ₁						
10°	1/8	.080	I	.200	1-1/2	996508	22.40	996508-C3	27.30		
	3/16	.080	I	1/4	2	996512	22.60	996512-C3	27.90		
	1/4	.080	I	5/16	2-1/2	996516	27.40	996516-C3	34.60		
15°	1/8	.080	I	.200	1-1/2	998108	22.40	998108-C3	27.30		
	3/16	.080	I	1/4	2	998112	22.60	998112-C3	27.90		
	1/4	.080	I	5/16	2-1/2	998116	27.40	998116-C3	34.60		
20°	1/8	.080	I	.200	1-1/2	999708	22.40	999708-C3	27.30	999708-C4	34.80
	3/16	.080	I	1/4	2	999712	22.60	999712-C3	27.90		
	1/4	.080	I	5/16	2-1/2	999716	27.40	999716-C3	34.60		
25°	1/8	.080	I	.200	1-1/2	983808	22.40	983808-C3	27.30		
	3/16	.080	I	1/4	2	983812	22.60	983812-C3	27.90		
	1/4	.080	I	5/16	2-1/2	983816	27.40	983816-C3	34.60		
30°	1/8	.080	I	.200	1-1/2	981508	19.90	981508-C3	24.80		
	1/8	.233	II	3/8	1-1/2	25010	15.20	25010-C3	20.10	25010-C4	27.60
	1/8	.233	II	3/8	4 <i>LONG!</i>	941708	25.00	941708-C3	30.30		
	3/16	.350	II	3/8	2	25020	19.70	25020-C3	25.00		
	1/4	.466	II	1/2	2-1/2	25030	24.40	25030-C3	31.60	25030-C4	43.80
35°	1/8	.198	II	3/8	1-1/2	853508	18.10	853508-C3	23.00		
40°	1/8	.080	I	.200	1-1/2	978608	20.80	978608-C3	25.70		
	1/8	.171	II	3/8	1-1/2	25110	15.80	25110-C3	20.70	25110-C4	28.20
	1/8	.171	II	3/8	4 <i>LONG!</i>	937808	26.10	937808-C3	31.40		
	3/16	.257	II	3/8	2	25120	21.10	25120-C3	26.40		
	1/4	.343	II	3/8	2-1/2	25130	25.60	25130-C3	32.80		
45°	1/8	.151	II	3/8	1-1/2	997308	16.70	997308-C3	21.60	997308-C4	29.10
	3/16	.226	II	3/8	2	997312	21.50	997312-C3	26.80		
	1/4	.302	II	3/8	2-1/2	997316	26.80	997316-C3	34.00		
50°	1/8	.134	II	3/8	1-1/2	998408	16.80	998408-C3	21.70		
	3/16	.201	II	3/8	2	998412	21.90	998412-C3	26.90		
	1/4	.268	II	3/8	2-1/2	998416	27.40	998416-C3	34.60		

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ENGRAVING CUTTERS

ENGRAVING CUTTERS

Pointed (cont.)



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INCL. ANGLE	DIA.	LENGTH OF CUT	TYPE	SPLIT LENGTH	OVERALL LENGTH	UNCOATED		A1TIN COATED		AMORPHOUS DIAMOND	
A	D ₂	L ₂		L ₃	L ₁	TOOL #	PRICE	TOOL #	PRICE	TOOL #	PRICE
55°	1/8	.120	II	3/8	1-1/2	855508	18.10	855508-C3	23.00		
60°	3 mm	2.60 mm	II	10 mm	38 mm	898657	17.40	898657-C3	22.30		
	1/8	.108	II	3/8	1-1/2	30010	15.20	30010-C3	20.10	30010-C4	27.60
	1/8	.108	II	3/8	4 LONG!	30410	25.00	30410-C3	30.30	30410-C4	37.40
	3/16	.162	II	3/8	2	30020	19.70	30020-C3	25.00	30020-C4	36.80
	3/16	.162	II	3/8	4 LONG!	30420	33.00	30420-C3	40.20		
	6 mm	5.20 mm	II	10 mm	63 mm	898666	28.20	898666-C3	35.40		
	1/4	.216	II	3/8	2-1/2	30030	24.40	30030-C3	31.60	30030-C4	43.80
	1/4	.216	II	3/8	6 LONG!	30430	47.40	30430-C3	56.90		
	3/8	.325	II	3/8	2-1/2	30040	34.40	30040-C3	43.90		
70°	1/8	.089	II	3/8	1-1/2	937208	16.80	937208-C3	21.70		
	3/16	.134	II	3/8	2	937212	21.90	937212-C3	26.90		
	1/4	.179	II	3/8	2-1/2	937216	27.40	937216-C3	34.60		
82°	1/8	.072	II	3/8	1-1/2	971708	16.80	971708-C3	21.70		
	3/16	.108	II	3/8	2	971712	21.90	971712-C3	26.90		
	1/4	.144	II	3/8	2-1/2	971716	27.40	971716-C3	34.60		
90°	3 mm	1.50 mm	II	10 mm	38 mm	884157	17.40	884157-C3	22.30		
	1/8	.062	II	3/8	1-1/2	30110	15.20	30110-C3	20.10	30110-C4	27.60
	1/8	.062	II	3/8	4 LONG!	30510	25.00	30510-C3	30.30		
	3/16	.093	II	3/8	2	30120	19.70	30120-C3	25.00	30120-C4	36.80
	3/16	.093	II	3/8	4 LONG!	30520	33.00	30520-C3	40.20		
	6 mm	3.00 mm	II	10 mm	63 mm	884166	28.20	884166-C3	35.40		
	1/4	.125	II	3/8	2-1/2	30130	24.40	30130-C3	31.60	30130-C4	43.80
	1/4	.125	II	3/8	6 LONG!	30530	47.40	30530-C3	56.90		
	3/8	.187	II	3/8	2-1/2	30140	34.40	30140-C3	43.90		
100°	1/8	.052	II	3/8	1-1/2	983508	16.80	983508-C3	21.70		
	3/16	.079	II	3/8	2	983512	21.90	983512-C3	26.90		
	1/4	.105	II	3/8	2-1/2	983516	27.40	983516-C3	34.60		
120°	1/8	.036	II	3/8	1-1/2	990508	15.20	990508-C3	20.10		
	3/16	.054	II	3/8	2	990512	19.70	990512-C3	25.00		
	1/4	.072	II	3/8	2-1/2	990516	24.40	990516-C3	31.60		

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- Double margin design for exceptional hole accuracy and finish
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- Select carbide grade for improved tool life
- CNC ground in the USA

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AlTiN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0100	#87	.254 mm	.047	1.20 mm	(3x)	3 mm	50 mm	CSG0100-C6	41.00
.0110	#85	.279 mm	.053	1.35 mm	(3x)	3 mm	50 mm	CSG0110-C6	41.00
.0120	#83	.304 mm	.057	1.45 mm	(3x)	3 mm	50 mm	CSG0120-C6	41.00
.0130	#81	.330 mm	.061	1.55 mm	(3x)	3 mm	50 mm	CSG0130-C6	41.00
.0144	#79	.368 mm	.069	1.75 mm	(3x)	3 mm	50 mm	CSG0144-C6	41.00
.0150		.381 mm	.071	1.80 mm	(3x)	3 mm	50 mm	CSG0150-C6	41.00
.0150		.381 mm	.102	2.60 mm	(5x)	3 mm	50 mm	BGN0150-C6	42.40
.0150		.381 mm	.146	3.70 mm	(8x)	3 mm	50 mm	ARY0150-C6	43.00
.0156 (1/64)		.396 mm	.075	1.90 mm	(3x)	3 mm	50 mm	CSG0156-C6	41.00
.0156 (1/64)		.396 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BGN0156-C6	42.40
.0156 (1/64)		.396 mm	.154	3.90 mm	(8x)	3 mm	50 mm	ARY0156-C6	43.00
.0156 (1/64)		.396 mm	.185	4.70 mm	(10x)	3 mm	50 mm	DXT0156-C6	44.20
.0156 (1/64)		.396 mm	.213	5.40 mm	(12x)	3 mm	50 mm	EFG0156-C6	45.60
.0160	#78	.406 mm	.079	2.00 mm	(3x)	3 mm	50 mm	CSG0160-C6	41.00
.0160	#78	.406 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BGN0160-C6	42.40
.0160	#78	.406 mm	.157	4.00 mm	(8x)	3 mm	50 mm	ARY0160-C6	43.00
.0160	#78	.406 mm	.220	5.60 mm	(12x)	3 mm	50 mm	EFG0160-C6	45.60
.0170		.431 mm	.083	2.10 mm	(3x)	3 mm	50 mm	CSG0170-C6	41.00
.0170		.431 mm	.165	4.20 mm	(8x)	3 mm	50 mm	ARY0170-C6	43.00
.0180	#77	.457 mm	.087	2.20 mm	(3x)	3 mm	50 mm	CSG0180-C6	41.00
.0180	#77	.457 mm	.122	3.10 mm	(5x)	3 mm	50 mm	BGN0180-C6	42.40
.0180	#77	.457 mm	.177	4.50 mm	(8x)	3 mm	50 mm	ARY0180-C6	43.00
.0180	#77	.457 mm	.244	6.20 mm	(12x)	3 mm	50 mm	EFG0180-C6	45.60
.0190		.482 mm	.091	2.30 mm	(3x)	3 mm	50 mm	CSG0190-C6	39.70
.0190		.482 mm	.185	4.70 mm	(8x)	3 mm	50 mm	ARY0190-C6	41.60
.0196		.500 mm	.094	2.40 mm	(3x)	3 mm	50 mm	CSG0196-C6	39.70
.0196		.500 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BGN0196-C6	40.50
.0196		.500 mm	.193	4.90 mm	(8x)	3 mm	50 mm	ARY0196-C6	41.60
.0196		.500 mm	.228	5.80 mm	(10x)	3 mm	50 mm	DXT0196-C6	42.90
.0196		.500 mm	.268	6.80 mm	(12x)	3 mm	50 mm	EFG0196-C6	44.20
.0200	#76	.508 mm	.094	2.40 mm	(3x)	3 mm	50 mm	CSG0200-C6	39.70
.0200	#76	.508 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BGN0200-C6	40.50
.0200	#76	.508 mm	.197	5.00 mm	(8x)	3 mm	50 mm	ARY0200-C6	41.60
.0200	#76	.508 mm	.236	6.00 mm	(10x)	3 mm	50 mm	DXT0200-C6	42.90
.0200	#76	.508 mm	.276	7.00 mm	(12x)	3 mm	50 mm	EFG0200-C6	44.20

continued on next page

MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

HARDENED STEELS

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0210	#75	.533 mm	.098	2.50 mm	(3x)	3 mm	50 mm	CSG0210-C6	39.70
.0210	#75	.533 mm	.142	3.60 mm	(5x)	3 mm	50 mm	BGN0210-C6	40.50
.0210	#75	.533 mm	.205	5.20 mm	(8x)	3 mm	50 mm	ARY0210-C6	41.60
.0210	#75	.533 mm	.291	7.40 mm	(12x)	3 mm	50 mm	EFG0210-C6	44.20
.0220		.558 mm	.106	2.70 mm	(3x)	3 mm	50 mm	CSG0220-C6	39.70
.0220		.558 mm	.213	5.40 mm	(8x)	3 mm	50 mm	ARY0220-C6	41.60
.0225	#74	.571 mm	.106	2.70 mm	(3x)	3 mm	50 mm	CSG0225-C6	39.70
.0225	#74	.571 mm	.154	3.90 mm	(5x)	3 mm	50 mm	BGN0225-C6	40.50
.0225	#74	.571 mm	.220	5.60 mm	(8x)	3 mm	50 mm	ARY0225-C6	41.60
.0225	#74	.571 mm	.307	7.80 mm	(12x)	3 mm	50 mm	EFG0225-C6	44.20
.0230		.584 mm	.110	2.80 mm	(3x)	3 mm	50 mm	CSG0230-C6	39.70
.0230		.584 mm	.220	5.60 mm	(8x)	3 mm	50 mm	ARY0230-C6	41.60
.0236		.600 mm	.114	2.90 mm	(3x)	3 mm	50 mm	CSG0236-C6	39.70
.0236		.600 mm	.228	5.80 mm	(8x)	3 mm	50 mm	ARY0236-C6	41.60
.0240	#73	.609 mm	.114	2.90 mm	(3x)	3 mm	50 mm	CSG0240-C6	39.70
.0240	#73	.609 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BGN0240-C6	40.50
.0240	#73	.609 mm	.236	6.00 mm	(8x)	3 mm	50 mm	ARY0240-C6	41.60
.0240	#73	.609 mm	.331	8.40 mm	(12x)	3 mm	50 mm	EFG0240-C6	44.20
.0250	#72	.635 mm	.118	3.00 mm	(3x)	3 mm	50 mm	CSG0250-C6	39.70
.0250	#72	.635 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BGN0250-C6	40.50
.0250	#72	.635 mm	.244	6.20 mm	(8x)	3 mm	50 mm	ARY0250-C6	41.60
.0250	#72	.635 mm	.346	8.80 mm	(12x)	3 mm	50 mm	EFG0250-C6	44.20
.0260	#71	.660 mm	.122	3.10 mm	(3x)	3 mm	50 mm	CSG0260-C6	39.70
.0260	#71	.660 mm	.173	4.40 mm	(5x)	3 mm	50 mm	BGN0260-C6	40.50
.0260	#71	.660 mm	.252	6.40 mm	(8x)	3 mm	50 mm	ARY0260-C6	41.60
.0260	#71	.660 mm	.354	9.00 mm	(12x)	3 mm	50 mm	EFG0260-C6	44.20
.0270		.685 mm	.130	3.30 mm	(3x)	3 mm	50 mm	CSG0270-C6	39.70
.0270		.685 mm	.260	6.60 mm	(8x)	3 mm	50 mm	ARY0270-C6	41.60
.0275		.700 mm	.130	3.30 mm	(3x)	3 mm	50 mm	CSG0275-C6	39.70
.0275		.700 mm	.268	6.80 mm	(8x)	3 mm	50 mm	ARY0275-C6	41.60
.0280	#70	.711 mm	.134	3.40 mm	(3x)	3 mm	50 mm	CSG0280-C6	39.70
.0280	#70	.711 mm	.189	4.80 mm	(5x)	3 mm	50 mm	BGN0280-C6	40.50
.0280	#70	.711 mm	.276	7.00 mm	(8x)	3 mm	50 mm	ARY0280-C6	41.60
.0280	#70	.711 mm	.386	9.80 mm	(12x)	3 mm	50 mm	EFG0280-C6	44.20
.0292	#69	.741 mm	.138	3.50 mm	(3x)	3 mm	50 mm	CSG0292-C6	39.70
.0292	#69	.741 mm	.197	5.00 mm	(5x)	3 mm	50 mm	BGN0292-C6	40.50
.0292	#69	.741 mm	.283	7.20 mm	(8x)	3 mm	50 mm	ARY0292-C6	41.60
.0292	#69	.741 mm	.394	10.00 mm	(12x)	3 mm	50 mm	EFG0292-C6	44.20
.0300		.762 mm	.142	3.60 mm	(3x)	3 mm	50mm	CSG0300-C6	40.20
.0300		.762 mm	.205	5.20 mm	(5x)	3 mm	50 mm	BGN0300-C6	41.20
.0300		.762 mm	.291	7.40 mm	(8x)	3 mm	50 mm	ARY0300-C6	41.60
.0300		.762 mm	.354	9.00 mm	(10x)	3 mm	50 mm	DXT0300-C6	42.90
.0310	#68	.787 mm	.146	3.70 mm	(3x)	3 mm	50 mm	CSG0310-C6	40.20
.0310	#68	.787 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BGN0310-C6	41.20
.0310	#68	.787 mm	.299	7.60 mm	(8x)	3 mm	50 mm	ARY0310-C6	41.60
.0310	#68	.787 mm	.433	11.00 mm	(12x)	3 mm	50 mm	EFG0310-C6	45.10

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MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth			2 FL	PRICE
D ₁ ^{+0.00mm} / _{-0.013mm}			L ₂ ^{+0.25mm} / _{-0.00mm}			D ₂ (h6)	L ₁		
.0312 (1/32)		.793 mm	.150	3.80 mm	(3x)	3 mm	50 mm	CSG0312-C6	40.20
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BGN0312-C6	41.20
.0312 (1/32)		.793 mm	.307	7.80 mm	(8x)	3 mm	50 mm	ARY0312-C6	42.40
.0312 (1/32)		.793 mm	.370	9.40 mm	(10x)	3 mm	50 mm	DXT0312-C6	43.70
.0312 (1/32)		.793 mm	.433	11.00 mm	(12x)	3 mm	50 mm	EFG0312-C6	45.10
.0315		.800 mm	.150	3.80 mm	(3x)	3 mm	50 mm	CSG0315-C6	40.20
.0315		.800 mm	.307	7.80 mm	(8x)	3 mm	50 mm	ARY0315-C6	42.40
.0320	#67	.812 mm	.154	3.90 mm	(3x)	3 mm	50 mm	CSG0320-C6	40.20
.0320	#67	.812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BGN0320-C6	41.20
.0320	#67	.812 mm	.315	8.00 mm	(8x)	3 mm	50 mm	ARY0320-C6	42.40
.0320	#67	.812 mm	.433	11.00 mm	(12x)	3 mm	50 mm	EFG0320-C6	45.10
.0330	#66	.838 mm	.157	4.00 mm	(3x)	3 mm	50 mm	CSG0330-C6	40.20
.0330	#66	.838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	BGN0330-C6	41.20
.0330	#66	.838 mm	.323	8.20 mm	(8x)	3 mm	50 mm	ARY0330-C6	42.40
.0330	#66	.838 mm	.453	11.50 mm	(12x)	3 mm	50 mm	EFG0330-C6	45.10
.0350	#65	.889 mm	.165	4.20 mm	(3x)	3 mm	50 mm	CSG0350-C6	40.20
.0350	#65	.889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BGN0350-C6	41.20
.0350	#65	.889 mm	.339	8.60 mm	(8x)	3 mm	50 mm	ARY0350-C6	42.40
.0350	#65	.889 mm	.413	10.50 mm	(10x)	3 mm	50 mm	DXT0350-C6	43.70
.0350	#65	.889 mm	.472	12.00 mm	(12x)	3 mm	50 mm	EFG0350-C6	45.10
.0354		.900 mm	.165	4.20 mm	(3x)	3 mm	50 mm	CSG0354-C6	40.20
.0354		.900 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BGN0354-C6	41.20
.0354		.900 mm	.346	8.80 mm	(8x)	3 mm	50 mm	ARY0354-C6	42.40
.0360	#64	.914 mm	.173	4.40 mm	(3x)	3 mm	50 mm	CSG0360-C6	40.20
.0360	#64	.914 mm	.244	6.20 mm	(5x)	3 mm	50 mm	BGN0360-C6	41.20
.0360	#64	.914 mm	.354	9.00 mm	(8x)	3 mm	50 mm	ARY0360-C6	42.40
.0360	#64	.914 mm	.492	12.50 mm	(12x)	3 mm	50 mm	EFG0360-C6	45.10
.0370	#63	.939 mm	.173	4.40 mm	(3x)	3 mm	50 mm	CSG0370-C6	40.20
.0370	#63	.939 mm	.252	6.40 mm	(5x)	3 mm	50 mm	BGN0370-C6	41.20
.0370	#63	.939 mm	.362	9.20 mm	(8x)	3 mm	50 mm	ARY0370-C6	42.40
.0370	#63	.939 mm	.512	13.00 mm	(12x)	3 mm	50 mm	EFG0370-C6	45.10
.0380	#62	.965 mm	.181	4.60 mm	(3x)	3 mm	50 mm	CSG0380-C6	40.20
.0380	#62	.965 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BGN0380-C6	41.20
.0380	#62	.965 mm	.370	9.40 mm	(8x)	3 mm	50 mm	ARY0380-C6	42.40
.0380	#62	.965 mm	.531	13.50 mm	(12x)	3 mm	50 mm	EFG0380-C6	45.10
.0390	#61	.990 mm	.189	4.80 mm	(3x)	3 mm	50 mm	CSG0390-C6	40.20
.0390	#61	.990 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BGN0390-C6	41.20
.0390	#61	.990 mm	.378	9.60 mm	(8x)	3 mm	50 mm	ARY0390-C6	42.40
.0390	#61	.990 mm	.531	13.50 mm	(12x)	3 mm	50 mm	EFG0390-C6	45.10
.0393		1.000 mm	.189	4.80 mm	(3x)	3 mm	50 mm	CSG0393-C6	43.70
.0393		1.000 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BGN0393-C6	44.80
.0393		1.000 mm	.386	9.80 mm	(8x)	3 mm	50 mm	ARY0393-C6	45.40
.0393		1.000 mm	.472	12.00 mm	(10x)	3 mm	50 mm	DXT0393-C6	47.00
.0393		1.000 mm	.551	14.00 mm	(12x)	3 mm	50 mm	EFG0393-C6	48.40
.0400	#60	1.016 mm	.189	4.80 mm	(3x)	3 mm	50 mm	CSG0400-C6	43.70
.0400	#60	1.016 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BGN0400-C6	44.80
.0400	#60	1.016 mm	.394	10.00 mm	(8x)	3 mm	50 mm	ARY0400-C6	45.40
.0400	#60	1.016 mm	.551	14.00 mm	(12x)	3 mm	50 mm	EFG0400-C6	48.40

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MINIATURE HIGH PERFORMANCE DRILLS
Hardened Steels (cont.)

HARDENED STEELS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0410	#59	1.041 mm	.197	5.00 mm	(3x)	3 mm	50 mm	CSG0410-C6	43.70
.0410	#59	1.041 mm	.276	7.00 mm	(5x)	3 mm	50 mm	BGN0410-C6	44.80
.0410	#59	1.041 mm	.394	10.00 mm	(8x)	3 mm	50 mm	ARY0410-C6	45.40
.0410	#59	1.041 mm	.571	14.50 mm	(12x)	3 mm	50 mm	EFG0410-C6	48.40
.0420	#58	1.066 mm	.197	5.00 mm	(3x)	3 mm	50 mm	CSG0420-C6	43.70
.0420	#58	1.066 mm	.283	7.20 mm	(5x)	3 mm	50 mm	BGN0420-C6	44.80
.0420	#58	1.066 mm	.413	10.50 mm	(8x)	3 mm	50 mm	ARY0420-C6	45.40
.0420	#58	1.066 mm	.571	14.50 mm	(12x)	3 mm	50 mm	EFG0420-C6	48.40
.0430	#57	1.092 mm	.205	5.20 mm	(3x)	3 mm	50 mm	CSG0430-C6	43.70
.0430	#57	1.092 mm	.291	7.40 mm	(5x)	3 mm	50 mm	BGN0430-C6	44.80
.0430	#57	1.092 mm	.413	10.50 mm	(8x)	3 mm	50 mm	ARY0430-C6	45.40
.0430	#57	1.092 mm	.591	15.00 mm	(12x)	3 mm	50 mm	EFG0430-C6	48.40
.0450		1.143 mm	.213	5.40 mm	(3x)	3 mm	50 mm	CSG0450-C6	43.70
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	BGN0450-C6	44.80
.0450		1.143 mm	.433	11.00 mm	(8x)	3 mm	50 mm	ARY0450-C6	45.40
.0465	#56	1.181 mm	.220	5.60 mm	(3x)	3 mm	50 mm	CSG0465-C6	43.70
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BGN0465-C6	44.80
.0465	#56	1.181 mm	.453	11.50 mm	(8x)	3 mm	50 mm	ARY0465-C6	45.40
.0465	#56	1.181 mm	.551	14.00 mm	(10x)	3 mm	50 mm	DXT0465-C6	47.00
.0465	#56	1.181 mm	.630	16.00 mm	(12x)	3 mm	63 mm	EFG0465-C6	48.40
.0468 (3/64)		1.190 mm	.220	5.60 mm	(3x)	3 mm	50 mm	CSG0468-C6	43.70
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BGN0468-C6	44.80
.0468 (3/64)		1.190 mm	.453	11.50 mm	(8x)	3 mm	50 mm	ARY0468-C6	45.40
.0468 (3/64)		1.190 mm	.551	14.00 mm	(10x)	3 mm	50 mm	DXT0468-C6	47.00
.0468 (3/64)		1.190 mm	.650	16.50 mm	(12x)	3 mm	63 mm	EFG0468-C6	48.40
.0492		1.250 mm	.236	6.00 mm	(3x)	3 mm	50 mm	CSG0492-C6	43.70
.0492		1.250 mm	.472	12.00 mm	(8x)	3 mm	50 mm	ARY0492-C6	48.70
.0500		1.270 mm	.236	6.00 mm	(3x)	3 mm	50 mm	CSG0500-C6	43.70
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BGN0500-C6	44.80
.0500		1.270 mm	.492	12.50 mm	(8x)	3 mm	50 mm	ARY0500-C6	45.40
.0500		1.270 mm	.689	17.50 mm	(12x)	3 mm	63 mm	EFG0500-C6	48.40
.0520	#55	1.320 mm	.244	6.20 mm	(3x)	3 mm	50 mm	CSG0520-C6	43.70
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	BGN0520-C6	44.80
.0520	#55	1.320 mm	.512	13.00 mm	(8x)	3 mm	50 mm	ARY0520-C6	45.40
.0520	#55	1.320 mm	.709	18.00 mm	(12x)	3 mm	63 mm	EFG0520-C6	48.40
.0550	#54	1.397 mm	.260	6.60 mm	(3x)	3 mm	50 mm	CSG0550-C6	43.70
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	BGN0550-C6	44.80
.0550	#54	1.397 mm	.531	13.50 mm	(8x)	3 mm	50 mm	ARY0550-C6	45.40
.0550	#54	1.397 mm	.748	19.00 mm	(12x)	3 mm	63 mm	EFG0550-C6	48.40
.0590		1.500 mm	.283	7.20 mm	(3x)	3 mm	50 mm	CSG0590-C6	47.10
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BGN0590-C6	48.10
.0590		1.500 mm	.571	14.50 mm	(8x)	3 mm	50 mm	ARY0590-C6	48.70
.0590		1.500 mm	.689	17.50 mm	(10x)	3 mm	63 mm	DXT0590-C6	50.00
.0590		1.500 mm	.827	21.00 mm	(12x)	3 mm	63 mm	EFG0590-C6	51.50
.0595	#53	1.511 mm	.283	7.20 mm	(3x)	3 mm	50 mm	CSG0595-C6	47.10
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BGN0595-C6	48.10

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MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

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HARDENED STEELS

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+0.00mm} -0.013mm		L ₂ ^{+0.25mm} -0.00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0595	#53	1.511 mm	.571	14.50 mm	(8x)	3 mm	50 mm	ARY0595-C6	48.70
.0595	#53	1.511 mm	.827	21.00 mm	(12x)	3 mm	63 mm	EFG0595-C6	51.50
.0600		1.524 mm	.283	7.20 mm	(3x)	3 mm	50 mm	CSG0600-C6	47.10
.0600		1.524 mm	.591	15.00 mm	(8x)	3 mm	50 mm	ARY0600-C6	48.70
.0625 (1/16)		1.587 mm	.299	7.60 mm	(3x)	3 mm	50 mm	CSG0625-C6	47.10
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BGN0625-C6	48.10
.0625 (1/16)		1.587 mm	.610	15.50 mm	(8x)	3 mm	50 mm	ARY0625-C6	48.70
.0625 (1/16)		1.587 mm	.728	18.50 mm	(10x)	3 mm	63 mm	DXT0625-C6	50.00
.0625 (1/16)		1.587 mm	.866	22.00 mm	(12x)	3 mm	63 mm	EFG0625-C6	51.50
.0635	#52	1.612 mm	.299	7.60 mm	(3x)	3 mm	50 mm	CSG0635-C6	47.10
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	BGN0635-C6	48.10
.0635	#52	1.612 mm	.610	15.50 mm	(8x)	3 mm	50 mm	ARY0635-C6	48.70
.0635	#52	1.612 mm	.866	22.00 mm	(12x)	3 mm	63 mm	EFG0635-C6	51.50
.0670	#51	1.701 mm	.315	8.00 mm	(3x)	3 mm	50 mm	CSG0670-C6	47.10
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	BGN0670-C6	48.10
.0670	#51	1.701 mm	.650	16.50 mm	(8x)	3 mm	63 mm	ARY0670-C6	48.70
.0670	#51	1.701 mm	.906	23.00 mm	(12x)	3 mm	63 mm	EFG0670-C6	51.50
.0700	#50	1.778 mm	.335	8.50 mm	(3x)	3 mm	50 mm	CSG0700-C6	47.10
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	BGN0700-C6	48.10
.0700	#50	1.778 mm	.689	17.50 mm	(8x)	3 mm	63 mm	ARY0700-C6	48.70
.0700	#50	1.778 mm	.827	21.00 mm	(10x)	3 mm	63 mm	DXT0700-C6	50.10
.0700	#50	1.778 mm	.945	24.00 mm	(12x)	3 mm	63 mm	EFG0700-C6	51.50
.0730	#49	1.854 mm	.354	9.00 mm	(3x)	3 mm	50 mm	CSG0730-C6	47.10
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	BGN0730-C6	48.10
.0730	#49	1.854 mm	.709	18.00 mm	(8x)	3 mm	63 mm	ARY0730-C6	48.70
.0730	#49	1.854 mm	.984	25.00 mm	(12x)	3 mm	63 mm	EFG0730-C6	51.50
.0760	#48	1.930 mm	.354	9.00 mm	(3x)	3 mm	50 mm	CSG0760-C6	47.10
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	BGN0760-C6	48.10
.0760	#48	1.930 mm	.748	19.00 mm	(8x)	3 mm	63 mm	ARY0760-C6	48.70
.0760	#48	1.930 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	EFG0760-C6	51.50
.0781 (5/64)		1.984 mm	.374	9.50 mm	(3x)	3 mm	50 mm	CSG0781-C6	47.10
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BGN0781-C6	48.10
.0781 (5/64)		1.984 mm	.768	19.50 mm	(8x)	3 mm	63 mm	ARY0781-C6	48.70
.0781 (5/64)		1.984 mm	.906	23.00 mm	(10x)	3 mm	63 mm	DXT0781-C6	50.00
.0781 (5/64)		1.984 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	EFG0781-C6	51.50
.0785	#47	1.993 mm	.374	9.50 mm	(3x)	3 mm	50 mm	CSG0785-C6	50.40
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BGN0785-C6	51.80
.0785	#47	1.993 mm	.768	19.50 mm	(8x)	3 mm	63 mm	ARY0785-C6	48.70
.0785	#47	1.993 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	EFG0785-C6	55.80
.0787		2.000 mm	.374	9.50 mm	(3x)	4 mm	50 mm	CSG0787-C6	50.40
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BGN0787-C6	51.80
.0787		2.000 mm	.768	19.50 mm	(8x)	4 mm	63 mm	ARY0787-C6	53.00
.0787		2.000 mm	.945	24.00 mm	(10x)	4 mm	63 mm	DXT0787-C6	54.40
.0787		2.000 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	EFG0787-C6	55.80
.0800		2.032 mm	.374	9.50 mm	(3x)	4 mm	50 mm	CSG0800-C6	50.40
.0800		2.032 mm	.787	20.00 mm	(8x)	4 mm	63 mm	ARY0800-C6	53.00

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Hardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0810	#46	2.057 mm	.394	10.00 mm	(3x)	4 mm	50 mm	CSG0810-C6	50.40
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BGN0810-C6	51.80
.0810	#46	2.057 mm	.787	20.00 mm	(8x)	4 mm	63 mm	ARY0810-C6	53.00
.0810	#46	2.057 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	EFG0810-C6	55.80
.0820	#45	2.082 mm	.394	10.00 mm	(3x)	4 mm	50 mm	CSG0820-C6	50.40
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BGN0820-C6	51.80
.0820	#45	2.082 mm	.787	20.00 mm	(8x)	4 mm	63 mm	ARY0820-C6	53.00
.0820	#45	2.082 mm	1.142	29.00 mm	(12x)	4 mm	75 mm	EFG0820-C6	55.80
.0860	#44	2.184 mm	.413	10.50 mm	(3x)	4 mm	50 mm	CSG0860-C6	50.40
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	BGN0860-C6	51.80
.0860	#44	2.184 mm	.827	21.00 mm	(8x)	4 mm	63 mm	ARY0860-C6	53.00
.0860	#44	2.184 mm	1.181	30.00 mm	(12x)	4 mm	75 mm	EFG0860-C6	55.80
.0890	#43	2.260 mm	.413	10.50 mm	(3x)	4 mm	50 mm	CSG0890-C6	50.40
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BGN0890-C6	51.80
.0890	#43	2.260 mm	.866	22.00 mm	(8x)	4 mm	63 mm	ARY0890-C6	53.00
.0890	#43	2.260 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	EFG0890-C6	55.80
.0900		2.286 mm	.433	11.00 mm	(3x)	4 mm	50 mm	CSG0900-C6	50.40
.0900		2.286 mm	.866	22.00 mm	(8x)	4 mm	63 mm	ARY0900-C6	53.00
.0935	#42	2.374 mm	.453	11.50 mm	(3x)	4 mm	50 mm	CSG0935-C6	50.40
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BGN0935-C6	51.80
.0935	#42	2.374 mm	.906	23.00 mm	(8x)	4 mm	63 mm	ARY0935-C6	53.00
.0935	#42	2.374 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	EFG0935-C6	55.80
.0937 (3/32)		2.381 mm	.453	11.50 mm	(3x)	4 mm	50 mm	CSG0937-C6	50.40
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BGN0937-C6	51.80
.0937 (3/32)		2.381 mm	.906	23.00 mm	(8x)	4 mm	63 mm	ARY0937-C6	53.00
.0937 (3/32)		2.381 mm	1.102	28.00 mm	(10x)	4 mm	63 mm	DXT0937-C6	54.40
.0937 (3/32)		2.381 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	EFG0937-C6	55.80
.0960	#41	2.438 mm	.453	11.50 mm	(3x)	4 mm	50 mm	CSG0960-C6	50.40
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BGN0960-C6	51.80
.0960	#41	2.438 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ARY0960-C6	53.00
.0960	#41	2.438 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	EFG0960-C6	55.80
.0980	#40	2.489 mm	.472	12.00 mm	(3x)	4 mm	50 mm	CSG0980-C6	50.40
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BGN0980-C6	51.80
.0980	#40	2.489 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ARY0980-C6	53.00
.0980	#40	2.489 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	EFG0980-C6	55.80
.0984		2.500 mm	.472	12.00 mm	(3x)	4 mm	50 mm	CSG0984-C6	53.40
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BGN0984-C6	55.00
.0984		2.500 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ARY0984-C6	56.40
.0984		2.500 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	EFG0984-C6	57.70
.0995	#39	2.527 mm	.472	12.00 mm	(3x)	4 mm	50 mm	CSG0995-C6	53.40
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BGN0995-C6	55.00
.0995	#39	2.527 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ARY0995-C6	56.40
.0995	#39	2.527 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	EFG0995-C6	59.20
.1000		2.540 mm	.472	12.00 mm	(3x)	4 mm	50 mm	CSG1000-C6	53.40
.1000		2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BGN1000-C6	55.00
.1000		2.540 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ARY1000-C6	56.40

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HARDENED STEELS

MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.1015	#38	2.578 mm	.472	12.00 mm	(3x)	4 mm	50 mm	CSG1015-C6	53.40
.1015	#38	2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BGN1015-C6	55.00
.1015	#38	2.578 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ARY1015-C6	56.40
.1015	#38	2.578 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	EFG1015-C6	59.20
.1040	#37	2.641 mm	.492	12.50 mm	(3x)	4 mm	50 mm	CSG1040-C6	53.40
.1040	#37	2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BGN1040-C6	55.00
.1040	#37	2.641 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	ARY1040-C6	56.40
.1040	#37	2.641 mm	1.417	36.00 mm	(12x)	4 mm	75 mm	EFG1040-C6	59.20
.1065	#36	2.705 mm	.512	13.00 mm	(3x)	4 mm	50 mm	CSG1065-C6	53.40
.1065	#36	2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BGN1065-C6	55.00
.1065	#36	2.705 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	ARY1065-C6	56.40
.1065	#36	2.705 mm	1.457	37.00 mm	(12x)	4 mm	75 mm	EFG1065-C6	59.20
.1093 (7/64)		2.778 mm	.512	13.00 mm	(3x)	4 mm	50 mm	CSG1093-C6	53.40
.1093 (7/64)		2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BGN1093-C6	55.00
.1093 (7/64)		2.778 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ARY1093-C6	56.40
.1093 (7/64)		2.778 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	DXT1093-C6	57.70
.1093 (7/64)		2.778 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	EFG1093-C6	59.20
.1100	#35	2.794 mm	.531	13.50 mm	(3x)	4 mm	50 mm	CSG1100-C6	53.40
.1100	#35	2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BGN1100-C6	55.00
.1100	#35	2.794 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ARY1100-C6	56.40
.1100	#35	2.794 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	EFG1100-C6	59.20
.1110	#34	2.819 mm	.531	13.50 mm	(3x)	4 mm	50 mm	CSG1110-C6	53.40
.1110	#34	2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BGN1110-C6	55.00
.1110	#34	2.819 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ARY1110-C6	56.40
.1110	#34	2.819 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	EFG1110-C6	59.20
.1130	#33	2.870 mm	.531	13.50 mm	(3x)	4 mm	50 mm	CSG1130-C6	53.40
.1130	#33	2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BGN1130-C6	55.00
.1130	#33	2.870 mm	1.102	28.00 mm	(8x)	4 mm	63 mm	ARY1130-C6	56.40
.1130	#33	2.870 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	EFG1130-C6	59.20
.1160	#32	2.946 mm	.551	14.00 mm	(3x)	4 mm	50 mm	CSG1160-C6	53.40
.1160	#32	2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BGN1160-C6	55.00
.1160	#32	2.946 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	ARY1160-C6	56.40
.1160	#32	2.946 mm	1.575	40.00 mm	(12x)	4 mm	75 mm	EFG1160-C6	59.20
.1181		3.000 mm	.571	14.50 mm	(3x)	4 mm	50 mm	CSG1181-C6	54.70
.1181		3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BGN1181-C6	56.00
.1181		3.000 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	ARY1181-C6	57.50
.1181		3.000 mm	1.378	35.00 mm	(10x)	4 mm	75 mm	DXT1181-C6	58.70
.1181		3.000 mm	1.654	42.00 mm	(12x)	4 mm	100 mm	EFG1181-C6	60.20
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.1200	#31	3.048 mm	.571	14.50 mm	(3x)	6 mm	63 mm	CSG1200-C6	61.30
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BGN1200-C6	51.70
.1200	#31	3.048 mm	1.181	30.00 mm	(8x)	6 mm	75 mm	ARY1200-C6	64.50
.1200	#31	3.048 mm	1.654	42.00 mm	(12x)	6 mm	100 mm	EFG1200-C6	67.10
.1250 (1/8)		3.175 mm	.591	15.00 mm	(3x)	6 mm	63 mm	CSG1250-C6	61.30
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BGN1250-C6	62.60

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MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

HARDENED STEELS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.1250 (1/8)		3.175 mm	1.220	31.00 mm	(8x)	6 mm	75 mm	ARY1250-C6	64.50
.1250 (1/8)		3.175 mm	1.457	37.00 mm	(10x)	6 mm	100 mm	DXT1250-C6	65.80
.1250 (1/8)		3.175 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	EFG1250-C6	67.10
.1285	#30	3.263 mm	.630	16.00 mm	(3x)	6 mm	63 mm	CSG1285-C6	61.30
.1285	#30	3.263 mm	1.220	32.00 mm	(8x)	6 mm	75 mm	ARY1285-C6	64.50
.1360	#29	3.454 mm	.630	16.00 mm	(3x)	6 mm	63 mm	CSG1360-C6	61.30
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	BGN1360-C6	62.60
.1360	#29	3.454 mm	1.339	34.00 mm	(8x)	6 mm	75 mm	ARY1360-C6	64.50
.1360	#29	3.454 mm	1.890	48.00 mm	(12x)	6 mm	100 mm	EFG1360-C6	67.10
.1405	#28	3.568 mm	.669	17.00 mm	(3x)	6 mm	63 mm	CSG1405-C6	61.30
.1405	#28	3.568 mm	1.378	35.00 mm	(8x)	6 mm	75 mm	ARY1405-C6	64.50
.1406 (9/64)		3.571 mm	.669	17.00 mm	(3x)	6 mm	63 mm	CSG1406-C6	61.30
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BGN1406-C6	62.60
.1406 (9/64)		3.571 mm	1.378	35.00 mm	(8x)	6 mm	75 mm	ARY1406-C6	64.50
.1406 (9/64)		3.571 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	EFG1406-C6	67.10
.1440	#27	3.657 mm	.669	17.00 mm	(3x)	6 mm	63 mm	CSG1440-C6	61.30
.1440	#27	3.657 mm	1.417	36.00 mm	(8x)	6 mm	100 mm	ARY1440-C6	64.50
.1470	#26	3.733 mm	.709	18.00 mm	(3x)	6 mm	63 mm	CSG1470-C6	61.30
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BGN1470-C6	62.60
.1470	#26	3.733 mm	1.417	36.00 mm	(8x)	6 mm	100 mm	ARY1470-C6	64.50
.1470	#26	3.733 mm	2.047	52.00 mm	(12x)	6 mm	100 mm	EFG1470-C6	67.10
.1495	#25	3.797 mm	.709	18.00 mm	(3x)	6 mm	63 mm	CSG1495-C6	61.30
.1495	#25	3.797 mm	1.457	37.00 mm	(8x)	6 mm	100 mm	ARY1495-C6	64.50
.1520	#24	3.860 mm	.709	18.00 mm	(3x)	6 mm	63 mm	CSG1520-C6	61.30
.1520	#24	3.860 mm	1.496	38.00 mm	(8x)	6 mm	100 mm	ARY1520-C6	64.50
.1540	#23	3.911 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1540-C6	61.30
.1540	#23	3.911 mm	1.496	38.00 mm	(8x)	6 mm	100 mm	ARY1540-C6	64.50
.1562 (5/32)		3.968 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1562-C6	61.30
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BGN1562-C6	62.60
.1562 (5/32)		3.968 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ARY1562-C6	64.50
.1562 (5/32)		3.968 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	EFG1562-C6	67.10
.1570	#22	3.987 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1570-C6	61.30
.1570	#22	3.987 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ARY1570-C6	64.50
.1574		4.000 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1574-C6	61.30
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BGN1574-C6	62.60
.1574		4.000 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ARY1574-C6	64.50
.1590	#21	4.038 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1590-C6	61.30
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BGN1590-C6	62.60
.1590	#21	4.038 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ARY1590-C6	64.50
.1590	#21	4.038 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	EFG1590-C6	67.10
.1610	#20	4.089 mm	.748	19.00 mm	(3x)	6 mm	63 mm	CSG1610-C6	61.30
.1610	#20	4.089 mm	1.575	40.00 mm	(8x)	6 mm	100 mm	ARY1610-C6	64.50
.1660	#19	4.216 mm	.787	20.00 mm	(3x)	6 mm	63 mm	CSG1660-C6	61.30
.1660	#19	4.216 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	ARY1660-C6	64.50
.1695	#18	4.305 mm	.787	20.00 mm	(3x)	6 mm	63 mm	CSG1695-C6	61.30
.1695	#18	4.305 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	ARY1695-C6	64.50

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Hardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.1718 (11/64)		4.365 mm	.827	21.00 mm	(3x)	6 mm	63 mm	CSG1718-C6	61.30
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BGN1718-C6	62.60
.1718 (11/64)		4.365 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	ARY1718-C6	64.50
.1730	#17	4.394 mm	.827	21.00 mm	(3x)	6 mm	63 mm	CSG1730-C6	61.30
.1730	#17	4.394 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	ARY1730-C6	64.50
.1770	#16	4.495 mm	.827	21.00 mm	(3x)	6 mm	63 mm	CSG1770-C6	61.30
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BGN1770-C6	62.60
.1770	#16	4.495 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	ARY1770-C6	64.50
.1770	#16	4.495 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	EFG1770-C6	67.10
.1800	#15	4.572 mm	.866	22.00 mm	(3x)	6 mm	63 mm	CSG1800-C6	61.30
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BGN1800-C6	62.60
.1800	#15	4.572 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	ARY1800-C6	64.50
.1800	#15	4.572 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	EFG1800-C6	67.10
.1820	#14	4.622 mm	.866	22.00 mm	(3x)	6 mm	63 mm	CSG1820-C6	61.30
.1820	#14	4.622 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	ARY1820-C6	64.50
.1850	#13	4.700 mm	.866	22.00 mm	(3x)	6 mm	63 mm	CSG1850-C6	61.30
.1850	#13	4.700 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	ARY1850-C6	64.50
.1875 (3/16)		4.762 mm	.906	23.00 mm	(3x)	6 mm	63 mm	CSG1875-C6	61.30
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BGN1875-C6	62.60
.1875 (3/16)		4.762 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	ARY1875-C6	64.50
.1875 (3/16)		4.762 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	EFG1875-C6	67.10
.1890	#12	4.800 mm	.906	23.00 mm	(3x)	6 mm	63 mm	CSG1890-C6	61.30
.1890	#12	4.800 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	ARY1890-C6	64.50
.1910	#11	4.851 mm	.906	23.00 mm	(3x)	6 mm	63 mm	CSG1910-C6	61.30
.1910	#11	4.851 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	ARY1910-C6	64.50
.1935	#10	4.914 mm	.906	23.00 mm	(3x)	6 mm	63 mm	CSG1935-C6	61.30
.1935	#10	4.914 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	ARY1935-C6	64.50
.1960	#9	4.978 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG1960-C6	61.30
.1960	#9	4.978 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	ARY1960-C6	64.50
.1968		5.000 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG1968-C6	61.30
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BGN1968-C6	62.60
.1968		5.000 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	ARY1968-C6	64.50
.1990	#8	5.054 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG1990-C6	61.30
.1990	#8	5.054 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ARY1990-C6	64.50
.2009	#7	5.105 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG2009-C6	61.30
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BGN2009-C6	62.60
.2009	#7	5.105 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ARY2009-C6	64.50
.2031 (13/64)		5.159 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG2031-C6	61.30
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BGN2031-C6	62.60
.2031 (13/64)		5.159 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ARY2031-C6	64.50
.2040	#6	5.181 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG2040-C6	61.30
.2040	#6	5.181 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ARY2040-C6	64.50
.2055	#5	5.219 mm	.945	24.00 mm	(3x)	6 mm	63 mm	CSG2055-C6	61.30
.2055	#5	5.219 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ARY2055-C6	64.50
.2090	#4	5.308 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	CSG2090-C6	61.30

continued on next page

HARDENED STEELS

MINIATURE HIGH PERFORMANCE DRILLS

Hardened Steels (cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN NANO COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		L ₂ $\begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		D ₂ (h6)	L ₁	2 FL	PRICE
.2090	#4	5.308 mm	2.047	52.00 mm	(8x)	6 mm	100 mm	ARY2090-C6	64.50
.2129	#3	5.410 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	CSG2129-C6	61.30
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BGN2129-C6	62.60
.2129	#3	5.410 mm	2.047	52.00 mm	(8x)	6 mm	100 mm	ARY2129-C6	64.50
.2187 (7/32)		5.556 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	CSG2187-C6	61.30
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BGN2187-C6	62.60
.2187 (7/32)		5.556 mm	2.126	54.00 mm	(8x)	6 mm	100 mm	ARY2187-C6	64.50
.2210	#2	5.613 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	CSG2210-C6	61.30
.2210	#2	5.613 mm	2.126	54.00 mm	(8x)	6 mm	100 mm	ARY2210-C6	64.50
.2280	#1	5.791 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	CSG2280-C6	61.30
.2280	#1	5.791 mm	2.205	56.00 mm	(8x)	6 mm	100 mm	ARY2280-C6	64.50
.2340	A	5.943 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	CSG2340-C6	61.30
.2340	A	5.943 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	ARY2340-C6	64.50
.2343 (15/64)		5.953 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	CSG2343-C6	61.30
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BGN2343-C6	62.60
.2343 (15/64)		5.953 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	ARY2343-C6	64.50
.2362		6.000 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	CSG2362-C6	61.30
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BGN2362-C6	62.60
.2362		6.000 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	ARY2362-C6	64.50
.2380	B	6.045 mm	1.102	28.00 mm	(3x)	8 mm	75 mm	CSG2380-C6	63.40
.2380	B	6.045 mm	2.283	58.00 mm	(8x)	8 mm	100 mm	ARY2380-C6	66.40
.2420	C	6.146 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	CSG2420-C6	63.40
.2420	C	6.146 mm	2.362	60.00 mm	(8x)	8 mm	100 mm	ARY2420-C6	66.40
.2460	D	6.248 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	CSG2460-C6	63.40
.2460	D	6.248 mm	2.362	60.00 mm	(8x)	8 mm	100 mm	ARY2460-C6	66.40
.2500 (1/4)	E	6.350 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	CSG2500-C6	63.40
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BGN2500-C6	64.60
.2500 (1/4)	E	6.350 mm	2.441	62.00 mm	(8x)	8 mm	125 mm	ARY2500-C6	66.40

HARDENED STEELS

SPEEDS & FEEDS (Miniature High Performance Drills – Hardened Steels)

Important Note: Values in table are in inches and are based on 3x and 5x drill lengths. For longer lengths, table values of IPR must be reduced (for 8x and 10x, reduce to 75%. For 12x, reduce to 65%). Pecking cycles are recommended to avoid chip piling and breakage. For materials at 38-45 Rc, initial peck depth should be 1-2x Diameter with each subsequent peck at .5-1x Diameter. For higher hardness materials, peck depths should be .5-1x Diameter. For complete speeds and feeds charts, please go to www.harveytool.com.

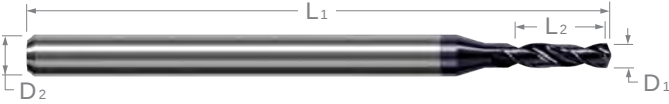
Material	Hardness	SFM	Chip Load IPR (Inches Per Revolution) By Drill Diameter								
			.015	.031	.047	.062	.078	.093	.125	.187	.250
Hardened Steels	38-45 Rc	150	.00029	.00060	.00090	.00119	.00150	.00179	.00240	.00359	.00480
	46-55 Rc	90	.00022	.00045	.00068	.00089	.00112	.00134	.00180	.00269	.00360
	56-68 Rc	40	.00014	.00030	.00045	.00060	.00075	.00089	.00120	.00180	.00240



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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels



Available for 3x, 5x, 8x, 10x, & 12x Hole Depths!

- Optimized for drilling prehardened medium alloy steels, stainless steels, and tool steels up to 45Rc
- 140° point angle
- Specialized flute shape for improved chip evacuation and maximum rigidity
- AlTiN coated for improved lubricity and heat resistance
- h6 shank tolerance for high precision tool holders
- Solid carbide CNC ground in the USA



Specialized Flute Shape for Improved Chip Evacuation

PREHARDENED STEELS

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0078		.200 mm	.037	.95 mm	(3x)	3 mm	50 mm	DHE0078-C3	41.00
.0078		.200 mm	.053	1.35 mm	(5x)	3 mm	50 mm	BVT0078-C3	42.20
.0079		.201 mm	.053	1.35 mm	(5x)	3 mm	50 mm	BVT0079-C3	42.20
.0083	#91	.210 mm	.039	1.00 mm	(3x)	3 mm	50 mm	DHE0083-C3	41.00
.0083	#91	.210 mm	.055	1.40 mm	(5x)	3 mm	50 mm	BVT0083-C3	42.20
.0087	#90	.221 mm	.041	1.05 mm	(3x)	3 mm	50 mm	DHE0087-C3	41.00
.0087	#90	.221 mm	.059	1.50 mm	(5x)	3 mm	50 mm	BVT0087-C3	42.20
.0091	#89	.231 mm	.043	1.10 mm	(3x)	3 mm	50 mm	DHE0091-C3	41.00
.0091	#89	.231 mm	.061	1.55 mm	(5x)	3 mm	50 mm	BVT0091-C3	42.20
.0095	#88	.241 mm	.045	1.15 mm	(3x)	3 mm	50 mm	DHE0095-C3	41.00
.0095	#88	.241 mm	.065	1.65 mm	(5x)	3 mm	50 mm	BVT0095-C3	42.20
.0100	#87	.254 mm	.047	1.20 mm	(3x)	3 mm	50 mm	DHE0100-C3	40.00
.0100	#87	.254 mm	.067	1.70 mm	(5x)	3 mm	50 mm	BVT0100-C3	41.00
.0100	#87	.254 mm	.098	2.50 mm	(8x)	3 mm	50 mm	ADS0100-C3	44.00
.0100	#87	.254 mm	.118	3.00 mm	(10x)	3 mm	50 mm	EXP0100-C3	45.40
.0100	#87	.254 mm	.138	3.50 mm	(12x)	3 mm	50 mm	CHT0100-C3	47.00
.0105	#86	.266 mm	.049	1.25 mm	(3x)	3 mm	50 mm	DHE0105-C3	40.00
.0105	#86	.266 mm	.071	1.80 mm	(5x)	3 mm	50 mm	BVT0105-C3	41.00
.0105	#86	.266 mm	.102	2.60 mm	(8x)	3 mm	50 mm	ADS0105-C3	44.00
.0105	#86	.266 mm	.146	3.70 mm	(12x)	3 mm	50 mm	CHT0105-C3	47.00
.0110	#85	.279 mm	.053	1.35 mm	(3x)	3 mm	50 mm	DHE0110-C3	40.00
.0110	#85	.279 mm	.075	1.90 mm	(5x)	3 mm	50 mm	BVT0110-C3	41.00
.0110	#85	.279 mm	.106	2.70 mm	(8x)	3 mm	50 mm	ADS0110-C3	44.00
.0110	#85	.279 mm	.130	3.30 mm	(10x)	3 mm	50 mm	EXP0110-C3	45.40
.0110	#85	.279 mm	.150	3.80 mm	(12x)	3 mm	50 mm	CHT0110-C3	47.00
.0115	#84	.292 mm	.055	1.40 mm	(3x)	3 mm	50 mm	DHE0115-C3	40.00
.0115	#84	.292 mm	.079	2.00 mm	(5x)	3 mm	50 mm	BVT0115-C3	41.00
.0115	#84	.292 mm	.110	2.80 mm	(8x)	3 mm	50 mm	ADS0115-C3	44.00
.0115	#84	.292 mm	.157	4.00 mm	(12x)	3 mm	50 mm	CHT0115-C3	47.00
.0118		.300 mm	.079	2.00 mm	(5x)	3 mm	50 mm	BVT0118-C3	41.00
.0118		.300 mm	.161	4.10 mm	(12x)	3 mm	50 mm	CHT0118-C3	47.00
.0120	#83	.304 mm	.057	1.45 mm	(3x)	3 mm	50 mm	DHE0120-C3	40.00
.0120	#83	.304 mm	.083	2.10 mm	(5x)	3 mm	50 mm	BVT0120-C3	41.00
.0120	#83	.304 mm	.118	3.00 mm	(8x)	3 mm	50 mm	ADS0120-C3	44.00
.0120	#83	.304 mm	.142	3.60 mm	(10x)	3 mm	50 mm	EXP0120-C3	45.40
.0120	#83	.304 mm	.165	4.20 mm	(12x)	3 mm	50 mm	CHT0120-C3	47.00

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MINIATURE HIGH PERFORMANCE DRILLS
Prehardened Steels (cont.)

PREHARDENED STEELS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0125	#82	.317 mm	.059	1.50 mm	(3x)	3 mm	50 mm	DHE0125-C3	40.00
.0125	#82	.317 mm	.083	2.10 mm	(5x)	3 mm	50 mm	BVT0125-C3	41.00
.0125	#82	.317 mm	.122	3.10 mm	(8x)	3 mm	50 mm	ADS0125-C3	44.00
.0125	#82	.317 mm	.173	4.40 mm	(12x)	3 mm	50 mm	CHT0125-C3	47.00
.0130	#81	.330 mm	.061	1.55 mm	(3x)	3 mm	50 mm	DHE0130-C3	40.00
.0130	#81	.330 mm	.087	2.20 mm	(5x)	3 mm	50 mm	BVT0130-C3	41.00
.0130	#81	.330 mm	.126	3.20 mm	(8x)	3 mm	50 mm	ADS0130-C3	44.00
.0130	#81	.330 mm	.154	3.90 mm	(10x)	3 mm	50 mm	EXP0130-C3	45.40
.0130	#81	.330 mm	.177	4.50 mm	(12x)	3 mm	50 mm	CHT0130-C3	47.00
.0135	#80	.342 mm	.065	1.65 mm	(3x)	3 mm	50 mm	DHE0135-C3	40.00
.0135	#80	.342 mm	.091	2.30 mm	(5x)	3 mm	50 mm	BVT0135-C3	41.00
.0135	#80	.342 mm	.130	3.30 mm	(8x)	3 mm	50 mm	ADS0135-C3	44.00
.0135	#80	.342 mm	.185	4.70 mm	(12x)	3 mm	50 mm	CHT0135-C3	47.00
.0140		.355 mm	.067	1.70 mm	(3x)	3 mm	50 mm	DHE0140-C3	40.00
.0140		.355 mm	.094	2.40 mm	(5x)	3 mm	50 mm	BVT0140-C3	41.00
.0140		.355 mm	.138	3.50 mm	(8x)	3 mm	50 mm	ADS0140-C3	44.00
.0140		.355 mm	.193	4.90 mm	(12x)	3 mm	50 mm	CHT0140-C3	47.00
.0144	#79	.368 mm	.069	1.75 mm	(3x)	3 mm	50 mm	DHE0144-C3	40.00
.0144	#79	.368 mm	.098	2.50 mm	(5x)	3 mm	50 mm	BVT0144-C3	41.00
.0144	#79	.368 mm	.142	3.60 mm	(8x)	3 mm	50 mm	ADS0144-C3	44.00
.0144	#79	.368 mm	.169	4.30 mm	(10x)	3 mm	50 mm	EXP0144-C3	45.40
.0144	#79	.368 mm	.197	5.00 mm	(12x)	3 mm	50 mm	CHT0144-C3	47.00
.0150		.381 mm	.071	1.80 mm	(3x)	3 mm	50 mm	DHE0150-C3	40.00
.0150		.381 mm	.102	2.60 mm	(5x)	3 mm	50 mm	BVT0150-C3	41.00
.0150		.381 mm	.146	3.70 mm	(8x)	3 mm	50 mm	ADS0150-C3	44.00
.0150		.381 mm	.205	5.20 mm	(12x)	3 mm	50 mm	CHT0150-C3	47.00
.0156 (1/64)		.396 mm	.075	1.90 mm	(3x)	3 mm	50 mm	DHE0156-C3	40.00
.0156 (1/64)		.396 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BVT0156-C3	41.00
.0156 (1/64)		.396 mm	.154	3.90 mm	(8x)	3 mm	50 mm	ADS0156-C3	44.00
.0156 (1/64)		.396 mm	.185	4.70 mm	(10x)	3 mm	50 mm	EXP0156-C3	45.40
.0156 (1/64)		.396 mm	.213	5.40 mm	(12x)	3 mm	50 mm	CHT0156-C3	47.00
.0157		.400 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BVT0157-C3	41.00
.0157		.400 mm	.220	5.60 mm	(12x)	3 mm	50 mm	CHT0157-C3	47.00
.0160	#78	.406 mm	.079	2.00 mm	(3x)	3 mm	50 mm	DHE0160-C3	40.00
.0160	#78	.406 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BVT0160-C3	41.00
.0160	#78	.406 mm	.157	4.00 mm	(8x)	3 mm	50 mm	ADS0160-C3	44.00
.0160	#78	.406 mm	.189	4.80 mm	(10x)	3 mm	50 mm	EXP0160-C3	45.40
.0160	#78	.406 mm	.220	5.60 mm	(12x)	3 mm	50 mm	CHT0160-C3	47.00
.0170		.431 mm	.083	2.10 mm	(3x)	3 mm	50 mm	DHE0170-C3	40.00
.0170		.431 mm	.114	2.90 mm	(5x)	3 mm	50 mm	BVT0170-C3	41.00
.0170		.431 mm	.165	4.20 mm	(8x)	3 mm	50 mm	ADS0170-C3	44.00
.0170		.431 mm	.236	6.00 mm	(12x)	3 mm	50 mm	CHT0170-C3	47.00
.0180	#77	.457 mm	.087	2.20 mm	(3x)	3 mm	50 mm	DHE0180-C3	40.00
.0180	#77	.457 mm	.122	3.10 mm	(5x)	3 mm	50 mm	BVT0180-C3	41.00
.0180	#77	.457 mm	.177	4.50 mm	(8x)	3 mm	50 mm	ADS0180-C3	44.40
.0180	#77	.457 mm	.213	5.40 mm	(10x)	3 mm	50 mm	EXP0180-C3	45.40
.0180	#77	.457 mm	.244	6.20 mm	(12x)	3 mm	50 mm	CHT0180-C3	47.00

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0190		.482 mm	.091	2.30 mm	(3x)	3 mm	50 mm	DHE0190-C3	40.00
.0190		.482 mm	.130	3.30 mm	(5x)	3 mm	50 mm	BVT0190-C3	41.00
.0190		.482 mm	.185	4.70 mm	(8x)	3 mm	50 mm	ADS0190-C3	44.00
.0190		.482 mm	.260	6.60 mm	(12x)	3 mm	50 mm	CHT0190-C3	47.00
.0196		.500 mm	.094	2.40 mm	(3x)	3 mm	50 mm	DHE0196-C3	39.50
.0196		.500 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BVT0196-C3	40.40
.0196		.500 mm	.193	4.90 mm	(8x)	3 mm	50 mm	ADS0196-C3	44.40
.0196		.500 mm	.228	5.80 mm	(10x)	3 mm	50 mm	EXP0196-C3	45.60
.0196		.500 mm	.268	6.80 mm	(12x)	3 mm	50 mm	CHT0196-C3	45.90
.0200	#76	.508 mm	.094	2.40 mm	(3x)	3 mm	50 mm	DHE0200-C3	39.50
.0200	#76	.508 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BVT0200-C3	40.40
.0200	#76	.508 mm	.197	5.00 mm	(8x)	3 mm	50 mm	ADS0200-C3	44.40
.0200	#76	.508 mm	.228	6.00 mm	(10x)	3 mm	50 mm	EXP0200-C3	45.60
.0200	#76	.508 mm	.276	7.00 mm	(12x)	3 mm	50 mm	CHT0200-C3	45.90
.0210	#75	.533 mm	.098	2.50 mm	(3x)	3 mm	50 mm	DHE0210-C3	39.50
.0210	#75	.533 mm	.142	3.60 mm	(5x)	3 mm	50 mm	BVT0210-C3	40.40
.0210	#75	.533 mm	.205	5.20 mm	(8x)	3 mm	50 mm	ADS0210-C3	44.40
.0210	#75	.533 mm	.244	6.20 mm	(10x)	3 mm	50 mm	EXP0210-C3	45.60
.0210	#75	.533 mm	.291	7.40 mm	(12x)	3 mm	50 mm	CHT0210-C3	45.90
.0220		.558 mm	.106	2.70 mm	(3x)	3 mm	50 mm	DHE0220-C3	39.50
.0220		.558 mm	.150	3.80 mm	(5x)	3 mm	50 mm	BVT0220-C3	40.40
.0220		.558 mm	.213	5.40 mm	(8x)	3 mm	50 mm	ADS0220-C3	44.40
.0220		.558 mm	.299	7.60 mm	(12x)	3 mm	50 mm	CHT0220-C3	45.90
.0225	#74	.571 mm	.106	2.70 mm	(3x)	3 mm	50 mm	DHE0225-C3	39.50
.0225	#74	.571 mm	.154	3.90 mm	(5x)	3 mm	50 mm	BVT0225-C3	40.40
.0225	#74	.571 mm	.220	5.60 mm	(8x)	3 mm	50 mm	ADS0225-C3	44.40
.0225	#74	.571 mm	.268	6.80 mm	(10x)	3 mm	50 mm	EXP0225-C3	45.60
.0225	#74	.571 mm	.307	7.80 mm	(12x)	3 mm	50 mm	CHT0225-C3	45.90
.0230		.584 mm	.110	2.80 mm	(3x)	3 mm	50 mm	DHE0230-C3	39.50
.0230		.584 mm	.154	3.90 mm	(5x)	3 mm	50 mm	BVT0230-C3	40.40
.0230		.584 mm	.220	5.60 mm	(8x)	3 mm	50 mm	ADS0230-C3	44.40
.0230		.584 mm	.315	8.00 mm	(12x)	3 mm	50 mm	CHT0230-C3	45.90
.0236		.600 mm	.157	4.00 mm	(5x)	3 mm	50 mm	BVT0236-C3	40.40
.0236		.600 mm	.323	8.20 mm	(12x)	3 mm	50 mm	CHT0236-C3	45.90
.0240	#73	.609 mm	.114	2.90 mm	(3x)	3 mm	50 mm	DHE0240-C3	39.50
.0240	#73	.609 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BVT0240-C3	40.40
.0240	#73	.609 mm	.236	6.00 mm	(8x)	3 mm	50 mm	ADS0240-C3	44.40
.0240	#73	.609 mm	.283	7.20 mm	(10x)	3 mm	50 mm	EXP0240-C3	45.60
.0240	#73	.609 mm	.331	8.40 mm	(12x)	3 mm	50 mm	CHT0240-C3	45.90
.0250	#72	.635 mm	.118	3.00 mm	(3x)	3 mm	50 mm	DHE0250-C3	39.50
.0250	#72	.635 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BVT0250-C3	40.40
.0250	#72	.635 mm	.244	6.20 mm	(8x)	3 mm	50 mm	ADS0250-C3	44.40
.0250	#72	.635 mm	.291	7.40 mm	(10x)	3 mm	50 mm	EXP0250-C3	45.60
.0250	#72	.635 mm	.346	8.80 mm	(12x)	3 mm	50 mm	CHT0250-C3	45.90
.0260	#71	.660 mm	.122	3.10 mm	(3x)	3 mm	50 mm	DHE0260-C3	39.50
.0260	#71	.660 mm	.173	4.40 mm	(5x)	3 mm	50 mm	BVT0260-C3	40.40
.0260	#71	.660 mm	.252	6.40 mm	(8x)	3 mm	50 mm	ADS0260-C3	44.40

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PREHARDENED STEELS

MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN COATED	
inch	wire	metric	inch	metric	hole depth				
D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$			L ₂ $\begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$			D ₂ (h6)	L ₁	2 FL	PRICE
.0260	#71	.660 mm	.307	7.80 mm	(10x)	3 mm	50 mm	EXP0260-C3	45.60
.0260	#71	.660 mm	.354	9.00 mm	(12x)	3 mm	50 mm	CHT0260-C3	45.90
.0270		.685 mm	.130	3.30 mm	(3x)	3 mm	50 mm	DHE0270-C3	39.50
.0270		.685 mm	.181	4.60 mm	(5x)	3 mm	50 mm	BVT0270-C3	40.40
.0270		.685 mm	.260	6.60 mm	(8x)	3 mm	50 mm	ADS0270-C3	44.40
.0270		.685 mm	.370	9.40 mm	(12x)	3 mm	50 mm	CHT0270-C3	45.90
.0275		.700 mm	.189	4.80 mm	(5x)	3 mm	50 mm	BVT0275-C3	40.40
.0275		.700 mm	.378	9.60 mm	(12x)	3 mm	50 mm	CHT0275-C3	45.90
.0280	#70	.711 mm	.134	3.40 mm	(3x)	3 mm	50 mm	DHE0280-C3	39.50
.0280	#70	.711 mm	.189	4.80 mm	(5x)	3 mm	50 mm	BVT0280-C3	40.40
.0280	#70	.711 mm	.276	7.00 mm	(8x)	3 mm	50 mm	ADS0280-C3	44.40
.0280	#70	.711 mm	.331	8.40 mm	(10x)	3 mm	50 mm	EXP0280-C3	45.60
.0280	#70	.711 mm	.386	9.80 mm	(12x)	3 mm	50 mm	CHT0280-C3	45.90
.0292	#69	.741 mm	.138	3.50 mm	(3x)	3 mm	50 mm	DHE0292-C3	39.50
.0292	#69	.741 mm	.197	5.00 mm	(5x)	3 mm	50 mm	BVT0292-C3	40.40
.0292	#69	.741 mm	.283	7.20 mm	(8x)	3 mm	50 mm	ADS0292-C3	44.40
.0292	#69	.741 mm	.346	8.80 mm	(10x)	3 mm	50 mm	EXP0292-C3	45.60
.0292	#69	.741 mm	.394	10.00 mm	(12x)	3 mm	50 mm	CHT0292-C3	45.90
.0300		.762 mm	.142	3.60 mm	(3x)	3 mm	50 mm	DHE0300-C3	39.50
.0300		.762 mm	.205	5.20 mm	(5x)	3 mm	50 mm	BVT0300-C3	40.40
.0300		.762 mm	.291	7.40 mm	(8x)	3 mm	50 mm	ADS0300-C3	44.40
.0300		.762 mm	.413	10.50 mm	(12x)	3 mm	50 mm	CHT0300-C3	45.90
.0310	#68	.787 mm	.146	3.70 mm	(3x)	3 mm	50 mm	DHE0310-C3	40.00
.0310	#68	.787 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BVT0310-C3	40.80
.0310	#68	.787 mm	.299	7.60 mm	(8x)	3 mm	50 mm	ADS0310-C3	44.40
.0310	#68	.787 mm	.362	9.20 mm	(10x)	3 mm	50 mm	EXP0310-C3	45.60
.0310	#68	.787 mm	.433	11.00 mm	(12x)	3 mm	50 mm	CHT0310-C3	47.10
.0312 (1/32)		.793 mm	.150	3.80 mm	(3x)	3 mm	50 mm	DHE0312-C3	40.00
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BVT0312-C3	40.80
.0312 (1/32)		.793 mm	.307	7.80 mm	(8x)	3 mm	50 mm	ADS0312-C3	44.40
.0312 (1/32)		.793 mm	.370	9.40 mm	(10x)	3 mm	50 mm	EXP0312-C3	45.60
.0312 (1/32)		.793 mm	.433	11.00 mm	(12x)	3 mm	50 mm	CHT0312-C3	47.10
.0315		.800 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BVT0315-C3	40.80
.0315		.800 mm	.433	11.00 mm	(12x)	3 mm	50 mm	CHT0315-C3	47.10
.0320	#67	.812 mm	.154	3.90 mm	(3x)	3 mm	50 mm	DHE0320-C3	40.00
.0320	#67	.812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BVT0320-C3	40.80
.0320	#67	.812 mm	.315	8.00 mm	(8x)	3 mm	50 mm	ADS0320-C3	44.40
.0320	#67	.812 mm	.378	9.60 mm	(10x)	3 mm	50 mm	EXP0320-C3	45.60
.0320	#67	.812 mm	.433	11.00 mm	(12x)	3 mm	50 mm	CHT0320-C3	47.10
.0330	#66	.838 mm	.157	4.00 mm	(3x)	3 mm	50 mm	DHE0330-C3	40.00
.0330	#66	.838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	BVT0330-C3	40.80
.0330	#66	.838 mm	.323	8.20 mm	(8x)	3 mm	50 mm	ADS0330-C3	44.40
.0330	#66	.838 mm	.386	9.80 mm	(10x)	3 mm	50 mm	EXP0330-C3	45.60
.0330	#66	.838 mm	.453	11.50 mm	(12x)	3 mm	50 mm	CHT0330-C3	47.10
.0350	#65	.889 mm	.165	4.20 mm	(3x)	3 mm	50 mm	DHE0350-C3	40.00
.0350	#65	.889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BVT0350-C3	40.80
.0350	#65	.889 mm	.339	8.60 mm	(8x)	3 mm	50 mm	ADS0350-C3	44.40

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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PREHARDENED STEELS

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+0.00mm} -0.013mm		L ₂ ^{+0.25mm} -0.00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0350	#65	.889 mm	.413	10.50 mm (10x)		3 mm	50 mm	EXP0350-C3	45.60
.0350	#65	.889 mm	.472	12.00 mm (12x)		3 mm	50 mm	CHT0350-C3	47.10
.0354		.900 mm	.236	6.00 mm (5x)		3 mm	50 mm	BVT0354-C3	38.90
.0354		.900 mm	.492	12.50 mm (12x)		3 mm	50 mm	CHT0354-C3	47.10
.0360	#64	.914 mm	.173	4.40 mm (3x)		3 mm	50 mm	DHE0360-C3	40.00
.0360	#64	.914 mm	.244	6.20 mm (5x)		3 mm	50 mm	BVT0360-C3	40.80
.0360	#64	.914 mm	.354	9.00 mm (8x)		3 mm	50 mm	ADS0360-C3	44.40
.0360	#64	.914 mm	.413	10.50 mm (10x)		3 mm	50 mm	EXP0360-C3	45.60
.0360	#64	.914 mm	.492	12.50 mm (12x)		3 mm	50 mm	CHT0360-C3	47.10
.0370	#63	.939 mm	.173	4.40 mm (3x)		3 mm	50 mm	DHE0370-C3	40.00
.0370	#63	.939 mm	.252	6.40 mm (5x)		3 mm	50 mm	BVT0370-C3	40.80
.0370	#63	.939 mm	.362	9.20 mm (8x)		3 mm	50 mm	ADS0370-C3	44.40
.0370	#63	.939 mm	.433	11.00 mm (10x)		3 mm	50 mm	EXP0370-C3	45.60
.0370	#63	.939 mm	.512	13.00 mm (12x)		3 mm	50 mm	CHT0370-C3	47.10
.0380	#62	.965 mm	.181	4.60 mm (3x)		3 mm	50 mm	DHE0380-C3	40.00
.0380	#62	.965 mm	.260	6.60 mm (5x)		3 mm	50 mm	BVT0380-C3	40.80
.0380	#62	.965 mm	.370	9.40 mm (8x)		3 mm	50 mm	ADS0380-C3	44.40
.0380	#62	.965 mm	.453	11.50 mm (10x)		3 mm	50 mm	EXP0380-C3	45.60
.0380	#62	.965 mm	.531	13.50 mm (12x)		3 mm	50 mm	CHT0380-C3	47.10
.0390	#61	.990 mm	.189	4.80 mm (3x)		3 mm	50 mm	DHE0390-C3	40.00
.0390	#61	.990 mm	.260	6.60 mm (5x)		3 mm	50 mm	BVT0390-C3	40.80
.0390	#61	.990 mm	.378	9.60 mm (8x)		3 mm	50 mm	ADS0390-C3	44.40
.0390	#61	.990 mm	.453	11.50 mm (10x)		3 mm	50 mm	EXP0390-C3	45.60
.0390	#61	.990 mm	.531	13.50 mm (12x)		3 mm	50 mm	CHT0390-C3	47.10
.0393		1.000 mm	.189	4.80 mm (3x)		3 mm	50 mm	DHE0393-C3	43.70
.0393		1.000 mm	.268	6.80 mm (5x)		3 mm	50 mm	BVT0393-C3	44.80
.0393		1.000 mm	.386	9.80 mm (8x)		3 mm	50 mm	ADS0393-C3	47.50
.0393		1.000 mm	.472	12.00 mm (10x)		3 mm	50 mm	EXP0393-C3	48.90
.0393		1.000 mm	.551	14.00 mm (12x)		3 mm	50 mm	CHT0393-C3	50.40
.0400	#60	1.016 mm	.189	4.80 mm (3x)		3 mm	50 mm	DHE0400-C3	43.70
.0400	#60	1.016 mm	.268	6.80 mm (5x)		3 mm	50 mm	BVT0400-C3	44.80
.0400	#60	1.016 mm	.394	10.00 mm (8x)		3 mm	50 mm	ADS0400-C3	47.50
.0400	#60	1.016 mm	.472	12.00 mm (10x)		3 mm	50 mm	EXP0400-C3	48.90
.0400	#60	1.016 mm	.551	14.00 mm (12x)		3 mm	50 mm	CHT0400-C3	50.40
.0410	#59	1.041 mm	.197	5.00 mm (3x)		3 mm	50 mm	DHE0410-C3	43.70
.0410	#59	1.041 mm	.276	7.00 mm (5x)		3 mm	50 mm	BVT0410-C3	44.80
.0410	#59	1.041 mm	.394	10.00 mm (8x)		3 mm	50 mm	ADS0410-C3	47.50
.0410	#59	1.041 mm	.472	12.00 mm (10x)		3 mm	50 mm	EXP0410-C3	48.90
.0410	#59	1.041 mm	.571	14.50 mm (12x)		3 mm	50 mm	CHT0410-C3	50.40
.0420	#58	1.066 mm	.197	5.00 mm (3x)		3 mm	50 mm	DHE0420-C3	43.70
.0420	#58	1.066 mm	.283	7.20 mm (5x)		3 mm	50 mm	BVT0420-C3	44.80
.0420	#58	1.066 mm	.413	10.50 mm (8x)		3 mm	50 mm	ADS0420-C3	47.50
.0420	#58	1.066 mm	.492	12.50 mm (10x)		3 mm	50 mm	EXP0420-C3	48.90
.0420	#58	1.066 mm	.571	14.50 mm (12x)		3 mm	50 mm	CHT0420-C3	50.40
.0430	#57	1.092 mm	.205	5.20 mm (3x)		3 mm	50 mm	DHE0430-C3	43.70
.0430	#57	1.092 mm	.291	7.40 mm (5x)		3 mm	50 mm	BVT0430-C3	44.80
.0430	#57	1.092 mm	.413	10.50 mm (8x)		3 mm	50 mm	ADS0430-C3	47.50
.0430	#57	1.092 mm	.512	13.00 mm (10x)		3 mm	50 mm	EXP0430-C3	48.90
.0430	#57	1.092 mm	.591	15.00 mm (12x)		3 mm	50 mm	CHT0430-C3	50.40

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiN COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	BVT0450-C3	44.80
.0450		1.143 mm	.610	15.50 mm	(12x)	3 mm	50 mm	CHT0450-C3	50.40
.0465	#56	1.181 mm	.220	5.60 mm	(3x)	3 mm	50 mm	DHE0465-C3	43.70
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BVT0465-C3	44.80
.0465	#56	1.181 mm	.453	11.50 mm	(8x)	3 mm	50 mm	ADS0465-C3	47.50
.0465	#56	1.181 mm	.551	14.00 mm	(10x)	3 mm	50 mm	EXP0465-C3	48.90
.0465	#56	1.181 mm	.630	16.00 mm	(12x)	3 mm	63 mm	CHT0465-C3	50.40
.0468 (3/64)		1.190 mm	.220	5.60 mm	(3x)	3 mm	50 mm	DHE0468-C3	43.70
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BVT0468-C3	44.80
.0468 (3/64)		1.190 mm	.453	11.50 mm	(8x)	3 mm	50 mm	ADS0468-C3	47.50
.0468 (3/64)		1.190 mm	.551	14.00 mm	(10x)	3 mm	50 mm	EXP0468-C3	48.90
.0468 (3/64)		1.190 mm	.650	16.50 mm	(12x)	3 mm	63 mm	CHT0468-C3	50.40
.0492		1.250 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BVT0492-C3	44.80
.0492		1.250 mm	.669	17.00 mm	(12x)	3 mm	63 mm	CHT0492-C3	50.40
.0500		1.270 mm	.236	6.00 mm	(3x)	3 mm	50 mm	DHE0500-C3	43.70
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BVT0500-C3	44.80
.0500		1.270 mm	.492	12.50 mm	(8x)	3 mm	50 mm	ADS0500-C3	47.50
.0500		1.270 mm	.591	15.00 mm	(10x)	3 mm	50 mm	EXP0500-C3	48.90
.0500		1.270 mm	.689	17.50 mm	(12x)	3 mm	63 mm	CHT0500-C3	50.40
.0520	#55	1.320 mm	.244	6.20 mm	(3x)	3 mm	50 mm	DHE0520-C3	43.70
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	BVT0520-C3	44.80
.0520	#55	1.320 mm	.512	13.00 mm	(8x)	3 mm	50 mm	ADS0520-C3	47.50
.0520	#55	1.320 mm	.610	15.50 mm	(10x)	3 mm	50 mm	EXP0520-C3	48.90
.0520	#55	1.320 mm	.709	18.00 mm	(12x)	3 mm	63 mm	CHT0520-C3	50.40
.0550	#54	1.397 mm	.260	6.60 mm	(3x)	3 mm	50 mm	DHE0550-C3	43.70
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	BVT0550-C3	44.80
.0550	#54	1.397 mm	.531	13.50 mm	(8x)	3 mm	50 mm	ADS0550-C3	47.50
.0550	#54	1.397 mm	.650	16.50 mm	(10x)	3 mm	63 mm	EXP0550-C3	48.90
.0550	#54	1.397 mm	.748	19.00 mm	(12x)	3 mm	63 mm	CHT0550-C3	50.40
.0590		1.500 mm	.283	7.20 mm	(3x)	3 mm	50 mm	DHE0590-C3	47.40
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BVT0590-C3	48.20
.0590		1.500 mm	.571	14.50 mm	(8x)	3 mm	50 mm	ADS0590-C3	51.00
.0590		1.500 mm	.689	17.50 mm	(10x)	3 mm	63 mm	EXP0590-C3	52.50
.0590		1.500 mm	.827	21.00 mm	(12x)	3 mm	63 mm	CHT0590-C3	54.00
.0595	#53	1.511 mm	.283	7.20 mm	(3x)	3 mm	50 mm	DHE0595-C3	47.40
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BVT0595-C3	48.20
.0595	#53	1.511 mm	.571	14.50 mm	(8x)	3 mm	50 mm	ADS0595-C3	51.00
.0595	#53	1.511 mm	.709	18.00 mm	(10x)	3 mm	63 mm	EXP0595-C3	52.50
.0595	#53	1.511 mm	.827	21.00 mm	(12x)	3 mm	63 mm	CHT0595-C3	54.00
.0600		1.524 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BVT0600-C3	48.20
.0600		1.524 mm	.827	21.00 mm	(12x)	3 mm	63 mm	CHT0600-C3	54.00
.0625 (1/16)		1.587 mm	.299	7.60 mm	(3x)	3 mm	50 mm	DHE0625-C3	47.40
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BVT0625-C3	48.20
.0625 (1/16)		1.587 mm	.610	15.50 mm	(8x)	3 mm	50 mm	ADS0625-C3	51.00
.0625 (1/16)		1.587 mm	.728	18.50 mm	(10x)	3 mm	63 mm	EXP0625-C3	52.50
.0625 (1/16)		1.587 mm	.866	22.00 mm	(12x)	3 mm	63 mm	CHT0625-C3	54.00

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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PREHARDENED STEELS

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		L ₂ $\begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		D ₂ (h6)	L ₁	2 FL	PRICE
.0635	#52	1.612 mm	.299	7.60 mm	(3x)	3 mm	50 mm	DHE0635-C3	47.40
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	BVT0635-C3	48.20
.0635	#52	1.612 mm	.610	15.50 mm	(8x)	3 mm	50 mm	ADS0635-C3	51.00
.0635	#52	1.612 mm	.748	19.00 mm	(10x)	3 mm	63 mm	EXP0635-C3	52.50
.0635	#52	1.612 mm	.866	22.00 mm	(12x)	3 mm	63 mm	CHT0635-C3	54.00
.0670	#51	1.701 mm	.315	8.00 mm	(3x)	3 mm	50 mm	DHE0670-C3	47.40
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	BVT0670-C3	48.20
.0670	#51	1.701 mm	.650	16.50 mm	(8x)	3 mm	63 mm	ADS0670-C3	51.00
.0670	#51	1.701 mm	.787	20.00 mm	(10x)	3 mm	63 mm	EXP0670-C3	52.50
.0670	#51	1.701 mm	.906	23.00 mm	(12x)	3 mm	63 mm	CHT0670-C3	54.00
.0700	#50	1.778 mm	.335	8.50 mm	(3x)	3 mm	50 mm	DHE0700-C3	47.40
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	BVT0700-C3	48.20
.0700	#50	1.778 mm	.689	17.50 mm	(8x)	3 mm	63 mm	ADS0700-C3	51.00
.0700	#50	1.778 mm	.827	21.00 mm	(10x)	3 mm	63 mm	EXP0700-C3	52.50
.0700	#50	1.778 mm	.945	24.00 mm	(12x)	3 mm	63 mm	CHT0700-C3	54.00
.0730	#49	1.854 mm	.354	9.00 mm	(3x)	3 mm	50 mm	DHE0730-C3	47.40
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	BVT0730-C3	48.20
.0730	#49	1.854 mm	.709	18.00 mm	(8x)	3 mm	63 mm	ADS0730-C3	51.00
.0730	#49	1.854 mm	.866	22.00 mm	(10x)	3 mm	63 mm	EXP0730-C3	52.50
.0730	#49	1.854 mm	.984	25.00 mm	(12x)	3 mm	63 mm	CHT0730-C3	54.00
.0760	#48	1.930 mm	.354	9.00 mm	(3x)	3 mm	50 mm	DHE0760-C3	47.40
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	BVT0760-C3	48.20
.0760	#48	1.930 mm	.748	19.00 mm	(8x)	3 mm	63 mm	ADS0760-C3	51.00
.0760	#48	1.930 mm	.906	23.00 mm	(10x)	3 mm	63 mm	EXP0760-C3	52.50
.0760	#48	1.930 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	CHT0760-C3	54.00
.0781 (5/64)		1.984 mm	.374	9.50 mm	(3x)	3 mm	50 mm	DHE0781-C3	47.40
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BVT0781-C3	48.20
.0781 (5/64)		1.984 mm	.768	19.50 mm	(8x)	3 mm	63 mm	ADS0781-C3	51.00
.0781 (5/64)		1.984 mm	.906	23.00 mm	(10x)	3 mm	63 mm	EXP0781-C3	51.20
.0781 (5/64)		1.984 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	CHT0781-C3	54.00
.0785	#47	1.993 mm	.374	9.50 mm	(3x)	3 mm	50 mm	DHE0785-C3	47.40
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BVT0785-C3	48.20
.0785	#47	1.993 mm	.768	19.50 mm	(8x)	3 mm	63 mm	ADS0785-C3	51.00
.0785	#47	1.993 mm	.906	23.00 mm	(10x)	3 mm	63 mm	EXP0785-C3	52.50
.0785	#47	1.993 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	CHT0785-C3	54.00
.0787		2.000 mm	.374	9.50 mm	(3x)	4 mm	50 mm	DHE0787-C3	47.40
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BVT0787-C3	52.00
.0787		2.000 mm	.768	19.50 mm	(8x)	4 mm	63 mm	ADS0787-C3	54.70
.0787		2.000 mm	.945	24.00 mm	(10x)	4 mm	63 mm	EXP0787-C3	56.40
.0787		2.000 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	CHT0787-C3	57.90
.0800		2.032 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BVT0800-C3	52.00
.0800		2.032 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	CHT0800-C3	57.90
.0810	#46	2.057 mm	.394	10.00 mm	(3x)	4 mm	50 mm	DHE0810-C3	47.40
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BVT0810-C3	52.00
.0810	#46	2.057 mm	.787	20.00 mm	(8x)	4 mm	63 mm	ADS0810-C3	54.70
.0810	#46	2.057 mm	.945	24.00 mm	(10x)	4 mm	63 mm	EXP0810-C3	56.40
.0810	#46	2.057 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	CHT0810-C3	57.90

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0820	#45	2.082 mm	.394	10.00 mm	(3x)	4 mm	50 mm	DHE0820-C3	47.40
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BVT0820-C3	52.00
.0820	#45	2.082 mm	.787	20.00 mm	(8x)	4 mm	63 mm	ADS0820-C3	54.70
.0820	#45	2.082 mm	.945	24.00 mm	(10x)	4 mm	63 mm	EXP0820-C3	56.40
.0820	#45	2.082 mm	1.142	29.00 mm	(12x)	4 mm	75 mm	CHT0820-C3	57.90
.0860	#44	2.184 mm	.413	10.50 mm	(3x)	4 mm	50 mm	DHE0860-C3	47.40
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	BVT0860-C3	52.00
.0860	#44	2.184 mm	.827	21.00 mm	(8x)	4 mm	63 mm	ADS0860-C3	54.70
.0860	#44	2.184 mm	1.024	26.00 mm	(10x)	4 mm	63 mm	EXP0860-C3	56.40
.0860	#44	2.184 mm	1.181	30.00 mm	(12x)	4 mm	75 mm	CHT0860-C3	57.90
.0890	#43	2.260 mm	.413	10.50 mm	(3x)	4 mm	50 mm	DHE0890-C3	47.40
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BVT0890-C3	52.00
.0890	#43	2.260 mm	.866	22.00 mm	(8x)	4 mm	63 mm	ADS0890-C3	54.70
.0890	#43	2.260 mm	1.063	27.00 mm	(10x)	4 mm	63 mm	EXP0890-C3	56.40
.0890	#43	2.260 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	CHT0890-C3	57.90
.0900		2.286 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BVT0900-C3	52.00
.0900		2.286 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	CHT0900-C3	57.90
.0935	#42	2.374 mm	.453	11.50 mm	(3x)	4 mm	50 mm	DHE0935-C3	47.40
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BVT0935-C3	52.00
.0935	#42	2.374 mm	.906	23.00 mm	(8x)	4 mm	63 mm	ADS0935-C3	54.70
.0935	#42	2.374 mm	1.102	28.00 mm	(10x)	4 mm	63 mm	EXP0935-C3	56.40
.0935	#42	2.374 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	CHT0935-C3	57.90
.0937 (3/32)		2.381 mm	.453	11.50 mm	(3x)	4 mm	50 mm	DHE0937-C3	50.70
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BVT0937-C3	52.00
.0937 (3/32)		2.381 mm	.906	23.00 mm	(8x)	4 mm	63 mm	ADS0937-C3	54.70
.0937 (3/32)		2.381 mm	1.102	28.00 mm	(10x)	4 mm	63 mm	EXP0937-C3	56.40
.0937 (3/32)		2.381 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	CHT0937-C3	57.70
.0960	#41	2.438 mm	.453	11.50 mm	(3x)	4 mm	50 mm	DHE0960-C3	50.70
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BVT0960-C3	52.00
.0960	#41	2.438 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ADS0960-C3	54.70
.0960	#41	2.438 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	EXP0960-C3	56.40
.0960	#41	2.438 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	CHT0960-C3	57.70
.0980	#40	2.489 mm	.472	12.00 mm	(3x)	4 mm	50 mm	DHE0980-C3	50.70
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BVT0980-C3	52.00
.0980	#40	2.489 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ADS0980-C3	54.70
.0980	#40	2.489 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	EXP0980-C3	56.40
.0980	#40	2.489 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	CHT0980-C3	57.70
.0984		2.500 mm	.472	12.00 mm	(3x)	4 mm	50 mm	DHE0984-C3	53.60
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BVT0984-C3	55.30
.0984		2.500 mm	.945	24.00 mm	(8x)	4 mm	63 mm	ADS0984-C3	58.00
.0984		2.500 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	EXP0984-C3	59.40
.0984		2.500 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	CHT0984-C3	60.80
.0995	#39	2.527 mm	.472	12.00 mm	(3x)	4 mm	50 mm	DHE0995-C3	53.60
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BVT0995-C3	55.30
.0995	#39	2.527 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ADS0995-C3	58.00
.0995	#39	2.527 mm	1.181	30.00 mm	(10x)	4 mm	75 mm	EXP0995-C3	59.40
.0995	#39	2.527 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	CHT0995-C3	60.80

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN COATED	
	inch	wire	metric	inch	metric	hole depth			
			$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL PRICE
.1000			2.540 mm	.472	12.00 mm	(3x)	4 mm	50 mm	DHE1000-C3 53.60
.1000			2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BVT1000-C3 55.30
.1000			2.540 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ADS1000-C3 58.00
.1000			2.540 mm	1.181	30.00 mm	(10x)	4 mm	75 mm	EXP1000-C3 59.40
.1000			2.540 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	CHT1000-C3 60.80
.1015	#38		2.578 mm	.472	12.00 mm	(3x)	4 mm	50 mm	DHE1015-C3 53.60
.1015	#38		2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BVT1015-C3 55.30
.1015	#38		2.578 mm	.984	25.00 mm	(8x)	4 mm	63 mm	ADS1015-C3 58.00
.1015	#38		2.578 mm	1.181	30.00 mm	(10x)	4 mm	75 mm	EXP1015-C3 59.40
.1015	#38		2.578 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	CHT1015-C3 60.80
.1040	#37		2.641 mm	.492	12.50 mm	(3x)	4 mm	50 mm	DHE1040-C3 53.60
.1040	#37		2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BVT1040-C3 55.30
.1040	#37		2.641 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	ADS1040-C3 58.00
.1040	#37		2.641 mm	1.220	31.00 mm	(10x)	4 mm	75 mm	EXP1040-C3 59.40
.1040	#37		2.641 mm	1.417	36.00 mm	(12x)	4 mm	75 mm	CHT1040-C3 60.80
.1065	#36		2.705 mm	.512	13.00 mm	(3x)	4 mm	50 mm	DHE1065-C3 53.60
.1065	#36		2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BVT1065-C3 55.30
.1065	#36		2.705 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	ADS1065-C3 58.00
.1065	#36		2.705 mm	1.260	32.00 mm	(10x)	4 mm	75 mm	EXP1065-C3 59.40
.1065	#36		2.705 mm	1.417	37.00 mm	(12x)	4 mm	75 mm	CHT1065-C3 60.80
.1093 (7/64)			2.778 mm	.512	13.00 mm	(3x)	4 mm	50 mm	DHE1093-C3 53.60
.1093 (7/64)			2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BVT1093-C3 55.30
.1093 (7/64)			2.778 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ADS1093-C3 58.00
.1093 (7/64)			2.778 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	EXP1093-C3 59.40
.1093 (7/64)			2.778 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	CHT1093-C3 60.80
.1100	#35		2.794 mm	.531	13.50 mm	(3x)	4 mm	50 mm	DHE1100-C3 53.60
.1100	#35		2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BVT1100-C3 55.30
.1100	#35		2.794 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ADS1100-C3 58.00
.1100	#35		2.794 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	EXP1100-C3 59.40
.1100	#35		2.794 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	CHT1100-C3 60.80
.1110	#34		2.819 mm	.531	13.50 mm	(3x)	4 mm	50 mm	DHE1110-C3 53.60
.1110	#34		2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BVT1110-C3 55.30
.1110	#34		2.819 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	ADS1110-C3 58.00
.1110	#34		2.819 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	EXP1110-C3 59.40
.1110	#34		2.819 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	CHT1110-C3 60.80
.1130	#33		2.870 mm	.531	13.50 mm	(3x)	4 mm	50 mm	DHE1130-C3 53.60
.1130	#33		2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BVT1130-C3 55.30
.1130	#33		2.870 mm	1.102	28.00 mm	(8x)	4 mm	63 mm	ADS1130-C3 58.00
.1130	#33		2.870 mm	1.339	34.00 mm	(10x)	4 mm	75 mm	EXP1130-C3 59.40
.1130	#33		2.870 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	CHT1130-C3 60.80
.1160	#32		2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BVT1160-C3 55.30
.1160	#32		2.946 mm	1.575	40.00 mm	(12x)	4 mm	75 mm	CHT1160-C3 60.80
.1181			3.000 mm	.571	14.50 mm	(3x)	4 mm	50 mm	DHE1181-C3 53.60
.1181			3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BVT1181-C3 55.30
.1181			3.000 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	ADS1181-C3 58.00
.1181			3.000 mm	1.378	35.00 mm	(10x)	4 mm	75 mm	EXP1181-C3 59.40
.1181			3.000 mm	1.654	42.00 mm	(12x)	4 mm	100 mm	CHT1181-C3 60.80

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PREHARDENED STEELS

MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AISI IN COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.1200	#31	3.048 mm	.571	14.50 mm	(3x)	6 mm	63 mm	DHE1200-C3	60.10
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BVT1200-C3	61.80
.1200	#31	3.048 mm	1.181	30.00 mm	(8x)	6 mm	75 mm	ADS1200-C3	64.60
.1200	#31	3.048 mm	1.417	36.00 mm	(10x)	6 mm	100 mm	EXP1200-C3	65.90
.1200	#31	3.048 mm	1.654	42.00 mm	(12x)	6 mm	100 mm	CHT1200-C3	67.20
.1240		3.149 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BVT1240-C3	61.80
.1240		3.149 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	CHT1240-C3	67.20
.1250 (1/8)		3.175 mm	.591	15.00 mm	(3x)	6 mm	63 mm	DHE1250-C3	60.10
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BVT1250-C3	61.80
.1250 (1/8)		3.175 mm	1.220	31.00 mm	(8x)	6 mm	75 mm	ADS1250-C3	64.60
.1250 (1/8)		3.175 mm	1.457	37.00 mm	(10x)	6 mm	100 mm	EXP1250-C3	65.90
.1250 (1/8)		3.175 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	CHT1250-C3	67.20
.1260		3.200 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BVT1260-C3	61.80
.1260		3.200 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	CHT1260-C3	67.20
.1285	#30	3.263 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BVT1285-C3	61.80
.1285	#30	3.263 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	CHT1285-C3	67.20
.1360	#29	3.454 mm	.630	16.00 mm	(3x)	6 mm	63 mm	DHE1360-C3	60.10
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	BVT1360-C3	61.80
.1360	#29	3.454 mm	1.339	34.00 mm	(8x)	6 mm	75 mm	ADS1360-C3	64.60
.1360	#29	3.454 mm	1.575	40.00 mm	(10x)	6 mm	100 mm	EXP1360-C3	65.90
.1360	#29	3.454 mm	1.890	48.00 mm	(12x)	6 mm	100 mm	CHT1360-C3	67.20
.1405	#28	3.568 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BVT1405-C3	61.80
.1405	#28	3.568 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	CHT1405-C3	67.20
.1406 (9/64)		3.571 mm	.669	17.00 mm	(3x)	6 mm	63 mm	DHE1406-C3	60.10
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BVT1406-C3	61.80
.1406 (9/64)		3.571 mm	1.378	35.00 mm	(8x)	6 mm	75 mm	ADS1406-C3	64.60
.1406 (9/64)		3.571 mm	1.654	42.00 mm	(10x)	6 mm	100 mm	EXP1406-C3	65.90
.1406 (9/64)		3.571 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	CHT1406-C3	67.20
.1417		3.600 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BVT1417-C3	61.80
.1417		3.600 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	CHT1417-C3	67.20
.1440	#27	3.657 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BVT1440-C3	61.80
.1440	#27	3.657 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	CHT1440-C3	67.20
.1470	#26	3.733 mm	.709	18.00 mm	(3x)	6 mm	63 mm	DHE1470-C3	60.10
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1470-C3	61.80
.1470	#26	3.733 mm	1.417	36.00 mm	(8x)	6 mm	100 mm	ADS1470-C3	64.60
.1470	#26	3.733 mm	1.732	44.00 mm	(10x)	6 mm	100 mm	EXP1470-C3	65.90
.1470	#26	3.733 mm	2.047	52.00 mm	(12x)	6 mm	100 mm	CHT1470-C3	67.20
.1495	#25	3.797 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1495-C3	61.80
.1495	#25	3.797 mm	2.047	52.00 mm	(12x)	6 mm	100 mm	CHT1495-C3	67.20
.1520	#24	3.860 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1520-C3	61.80
.1520	#24	3.860 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	CHT1520-C3	67.20
.1540	#23	3.911 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1540-C3	61.80
.1540	#23	3.911 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	CHT1540-C3	67.20
.1562 (5/32)		3.968 mm	.748	19.00 mm	(3x)	6 mm	63 mm	DHE1562-C3	60.10
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1562-C3	61.80
.1562 (5/32)		3.968 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ADS1562-C3	64.60
.1562 (5/32)		3.968 mm	1.811	46.00 mm	(10x)	6 mm	100 mm	EXP1562-C3	65.90
.1562 (5/32)		3.968 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	CHT1562-C3	67.20

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PREHARDENED STEELS

MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

PREHARDENED STEELS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AISI IN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		L ₂ $\begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		D ₂ (h6)	L ₁	2 FL	PRICE
.1570	#22	3.987 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BVT1570-C3	61.80
.1570	#22	3.987 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	CHT1570-C3	67.20
.1574		4.000 mm	.748	19.00 mm	(3x)	6 mm	63 mm	DHE1574-C3	60.10
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BVT1574-C3	61.80
.1574		4.000 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ADS1574-C3	64.60
.1574		4.000 mm	1.890	48.00 mm	(10x)	6 mm	100 mm	EXP1574-C3	65.90
.1574		4.000 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	CHT1574-C3	67.20
.1590	#21	4.038 mm	.748	19.00 mm	(3x)	6 mm	63 mm	DHE1590-C3	60.10
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BVT1590-C3	61.80
.1590	#21	4.038 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	ADS1590-C3	64.60
.1590	#21	4.038 mm	1.890	48.00 mm	(10x)	6 mm	100 mm	EXP1590-C3	65.90
.1590	#21	4.038 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	CHT1590-C3	67.20
.1610	#20	4.089 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BVT1610-C3	61.80
.1610	#20	4.089 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	CHT1610-C3	67.20
.1660	#19	4.216 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BVT1660-C3	61.80
.1660	#19	4.216 mm	2.283	58.00 mm	(12x)	6 mm	100 mm	CHT1660-C3	67.20
.1695	#18	4.305 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BVT1695-C3	61.80
.1695	#18	4.305 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	CHT1695-C3	67.20
.1718 (11/64)		4.365 mm	.827	21.00 mm	(3x)	6 mm	63 mm	DHE1718-C3	60.10
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BVT1718-C3	61.80
.1718 (11/64)		4.365 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	ADS1718-C3	64.60
.1718 (11/64)		4.365 mm	2.047	52.00 mm	(10x)	6 mm	100 mm	EXP1718-C3	65.90
.1718 (11/64)		4.365 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	CHT1718-C3	67.20
.1730	#17	4.394 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BVT1730-C3	61.80
.1730	#17	4.394 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	CHT1730-C3	67.20
.1770	#16	4.495 mm	.827	21.00 mm	(3x)	6 mm	63 mm	DHE1770-C3	60.10
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BVT1770-C3	61.80
.1770	#16	4.495 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	ADS1770-C3	64.60
.1770	#16	4.495 mm	2.047	52.00 mm	(10x)	6 mm	100 mm	EXP1770-C3	65.90
.1770	#16	4.495 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	CHT1770-C3	67.20
.1800	#15	4.572 mm	.866	22.00 mm	(3x)	6 mm	63 mm	DHE1800-C3	60.10
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BVT1800-C3	61.80
.1800	#15	4.572 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	ADS1800-C3	64.60
.1800	#15	4.572 mm	2.126	54.00 mm	(10x)	6 mm	100 mm	EXP1800-C3	65.90
.1800	#15	4.572 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	CHT1800-C3	67.20
.1820	#14	4.622 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BVT1820-C3	61.80
.1820	#14	4.622 mm	2.520	64.00 mm	(12x)	6 mm	125 mm	CHT1820-C3	67.20
.1850	#13	4.700 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BVT1850-C3	61.80
.1850	#13	4.700 mm	2.520	64.00 mm	(12x)	6 mm	125 mm	CHT1850-C3	67.20
.1875 (3/16)		4.762 mm	.906	23.00 mm	(3x)	6 mm	63 mm	DHE1875-C3	60.10
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BVT1875-C3	61.80
.1875 (3/16)		4.762 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	ADS1875-C3	64.60
.1875 (3/16)		4.762 mm	2.205	56.00 mm	(10x)	6 mm	100 mm	EXP1875-C3	65.90
.1875 (3/16)		4.762 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	CHT1875-C3	67.20
.1890	#12	4.800 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BVT1890-C3	61.80
.1890	#12	4.800 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	CHT1890-C3	67.20
.1910	#11	4.851 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BVT1910-C3	61.80
.1910	#11	4.851 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	CHT1910-C3	67.20

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	A1TiN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.1935	#10	4.914 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT1935-C3	61.80
.1935	#10	4.914 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	CHT1935-C3	67.20
.1960	#9	4.978 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT1960-C3	61.80
.1960	#9	4.978 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	CHT1960-C3	67.20
.1968		5.000 mm	.945	24.00 mm	(3x)	6 mm	63 mm	DHE1968-C3	60.10
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT1968-C3	61.80
.1968		5.000 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	ADS1968-C3	64.60
.1968		5.000 mm	2.283	58.00 mm	(10x)	6 mm	100 mm	EXP1968-C3	65.90
.1968		5.000 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	CHT1968-C3	67.20
.1990	#8	5.054 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT1990-C3	61.80
.1990	#8	5.054 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	CHT1990-C3	67.20
.2009	#7	5.105 mm	.945	24.00 mm	(3x)	6 mm	63 mm	DHE2009-C3	60.10
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT2009-C3	61.80
.2009	#7	5.105 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ADS2009-C3	64.60
.2009	#7	5.105 mm	2.362	60.00 mm	(10x)	6 mm	100 mm	EXP2009-C3	65.90
.2009	#7	5.105 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	CHT2009-C3	67.20
.2031 (13/64)		5.159 mm	.945	24.00 mm	(3x)	6 mm	63 mm	DHE2031-C3	60.10
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT2031-C3	61.80
.2031 (13/64)		5.159 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	ADS2031-C3	64.60
.2031 (13/64)		5.159 mm	2.362	60.00 mm	(10x)	6 mm	100 mm	EXP2031-C3	65.90
.2031 (13/64)		5.159 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	CHT2031-C3	67.20
.2040	#6	5.181 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BVT2040-C3	61.80
.2040	#6	5.181 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	CHT2040-C3	67.20
.2055	#5	5.219 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BVT2055-C3	61.80
.2055	#5	5.219 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	CHT2055-C3	67.20
.2090		5.308 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BVT2090-C3	61.80
.2090		5.308 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	CHT2090-C3	67.20
.2129	#3	5.410 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	DHE2129-C3	60.10
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BVT2129-C3	61.80
.2129	#3	5.410 mm	2.047	52.00 mm	(8x)	6 mm	100 mm	ADS2129-C3	64.60
.2129	#3	5.410 mm	2.520	64.00 mm	(10x)	6 mm	125 mm	EXP2129-C3	65.90
.2129	#3	5.410 mm	2.913	74.00 mm	(12x)	6 mm	125 mm	CHT2129-C3	67.20
.2165		5.500 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BVT2165-C3	61.80
.2165		5.500 mm	2.992	76.00 mm	(12x)	6 mm	125 mm	CHT2165-C3	67.20
.2187 (7/32)		5.556 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	DHE2187-C3	60.10
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BVT2187-C3	61.80
.2187 (7/32)		5.556 mm	2.126	54.00 mm	(8x)	6 mm	100 mm	ADS2187-C3	64.60
.2187 (7/32)		5.556 mm	2.598	66.00 mm	(10x)	6 mm	125 mm	EXP2187-C3	65.90
.2187 (7/32)		5.556 mm	2.992	76.00 mm	(12x)	6 mm	125 mm	CHT2187-C3	67.20
.2205		5.600 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BVT2205-C3	61.80
.2205		5.600 mm	3.071	78.00 mm	(12x)	6 mm	125 mm	CHT2205-C3	67.20
.2210	#2	5.613 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BVT2210-C3	61.80
.2210	#2	5.613 mm	3.071	78.00 mm	(12x)	6 mm	125 mm	CHT2210-C3	67.20
.2280	#1	5.791 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BVT2280-C3	61.80
.2280	#1	5.791 mm	3.150	80.00 mm	(12x)	6 mm	125 mm	CHT2280-C3	67.20
.2340	A	5.943 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BVT2340-C3	61.80
.2340	A	5.943 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	CHT2340-C3	67.20

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MINIATURE HIGH PERFORMANCE DRILLS

Prehardened Steels (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITiN COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.2343 (15/64)		5.953 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	DHE2343-C3	60.10
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BVT2343-C3	61.80
.2343 (15/64)		5.953 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	ADS2343-C3	64.60
.2343 (15/64)		5.953 mm	2.756	70.00 mm	(10x)	6 mm	125 mm	EXP2343-C3	65.90
.2343 (15/64)		5.953 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	CHT2343-C3	67.20
.2362		6.000 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	DHE2362-C3	60.10
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BVT2362-C3	61.80
.2362		6.000 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	ADS2362-C3	64.60
.2362		6.000 mm	2.756	70.00 mm	(10x)	6 mm	125 mm	EXP2362-C3	65.90
.2362		6.000 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	CHT2362-C3	67.20
.2380	B	6.045 mm	1.575	40.00 mm	(5x)	8 mm	100 mm	BVT2380-C3	64.00
.2380	B	6.045 mm	3.307	84.00 mm	(12x)	8 mm	125 mm	CHT2380-C3	69.40
.2420	C	6.146 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BVT2420-C3	64.00
.2420	C	6.146 mm	3.307	84.00 mm	(12x)	8 mm	125 mm	CHT2420-C3	69.40
.2460	D	6.248 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BVT2460-C3	64.00
.2460	D	6.248 mm	3.386	86.00 mm	(12x)	8 mm	150 mm	CHT2460-C3	69.40
.2500 (1/4)	E	6.350 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	DHE2500-C3	60.10
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BVT2500-C3	61.80
.2500 (1/4)	E	6.350 mm	2.441	62.00 mm	(8x)	8 mm	125 mm	ADS2500-C3	64.60
.2500 (1/4)	E	6.350 mm	2.913	74.00 mm	(10x)	8 mm	125 mm	EXP2500-C3	65.90
.2500 (1/4)	E	6.350 mm	3.465	88.00 mm	(12x)	8 mm	150 mm	CHT2500-C3	67.20

SPEEDS & FEEDS (Miniature High Performance Drills – Prehardened Steels)

Important Note: Values in table are in inches and are based on 3x and 5x drill lengths and a material hardness of 29-37 Rc. For longer lengths, table values of IPR must be reduced (for 8x and 10x, reduce to 75%; for 12x, reduce to 65%). For ferrous materials at 38-45 Rc, reduce IPR (for 3x and 5x, reduce to 80%; for 8x and 10x, reduce to 60%; for 12x, reduce to 52%). Pecking cycles are recommended to avoid chip packing and breakage. For materials at 29-37 Rc, initial peck depth should be 2-3x Diameter with each subsequent peck at 1-2x Diameter. For materials at 38-45 Rc, initial peck depth should be 1-2x Diameter with each subsequent peck at .5-1x Diameter. For complete speeds and feeds charts, please go to www.harveytool.com.

Material (Hardness: 29-37 Rc)	SFM	Chip Load IPR (Inches Per Revolution) By Drill Diameter								
		.015	.031	.047	.062	.078	.093	.125	.187	.250
Carbon Steels Free Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	240	.00063	.00130	.00197	.00260	.00328	.00391	.00525	.00785	.01050
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	150	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
Stainless Steels 203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	180	.00063	.00130	.00197	.00260	.00328	.00391	.00525	.00785	.01050
201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502	150	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	125	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
Tool Steels A, L, O, P, W series	125	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
D, H, M, T, S series	90	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
Titanium Alloys	100	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
High Temp Alloys Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600

MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys



Available for 3x, 5x,
8x, 10x, & 12x Hole
Depths!



Special 3 Flute Design to
Maximize Chip Flow, Hole
Accuracy, and Finish

- Optimized for drilling aluminum and aluminum alloys with excellent performance in unfilled plastics, copper, brass, and bronze alloys
- Special 3 flute design to maximize chip flow, hole accuracy, and finish
- 130° point angle
- Polished flute valleys and TiB₂ coating prevent built-up edge and extend tool life
- h6 shank tolerance for high precision tool holders
- Solid carbide CNC ground in the USA

DRILL DIAMETER		FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	metric	inch	metric	hole depth				
	D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.0150	.381 mm	.071	1.80 mm	(3x)	3 mm	50 mm	AVA0150-C8	44.60
.0150	.381 mm	.102	2.60 mm	(5x)	3 mm	50 mm	BAF0150-C8	45.60
.0150	.381 mm	.205	5.20 mm	(12x)	3 mm	50 mm	DQW0150-C8	51.40
.0156 (1/64)	.396 mm	.075	1.90 mm	(3x)	3 mm	50 mm	AVA0156-C8	44.60
.0156 (1/64)	.396 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BAF0156-C8	45.60
.0156 (1/64)	.396 mm	.154	3.90 mm	(8x)	3 mm	50 mm	CBG0156-C8	48.70
.0156 (1/64)	.396 mm	.185	4.70 mm	(10x)	3 mm	50 mm	ERY0156-C8	50.00
.0156 (1/64)	.396 mm	.213	5.40 mm	(12x)	3 mm	50 mm	DQW0156-C8	51.40
.0160	#78 .406 mm	.079	2.00 mm	(3x)	3 mm	50 mm	AVA0160-C8	44.60
.0160	#78 .406 mm	.106	2.70 mm	(5x)	3 mm	50 mm	BAF0160-C8	45.60
.0160	#78 .406 mm	.157	4.00 mm	(8x)	3 mm	50 mm	CBG0160-C8	48.70
.0160	#78 .406 mm	.189	4.80 mm	(10x)	3 mm	50 mm	ERY0160-C8	50.00
.0160	#78 .406 mm	.220	5.60 mm	(12x)	3 mm	50 mm	DQW0160-C8	51.40
.0170	.431 mm	.114	2.90 mm	(5x)	3 mm	50 mm	BAF0170-C8	45.60
.0170	.431 mm	.236	6.00 mm	(12x)	3 mm	50 mm	DQW0170-C8	51.40
.0180	#77 .457 mm	.087	2.20 mm	(3x)	3 mm	50 mm	AVA0180-C8	44.60
.0180	#77 .457 mm	.122	3.10 mm	(5x)	3 mm	50 mm	BAF0180-C8	45.60
.0180	#77 .457 mm	.177	4.50 mm	(8x)	3 mm	50 mm	CBG0180-C8	48.70
.0180	#77 .457 mm	.213	5.40 mm	(10x)	3 mm	50 mm	ERY0180-C8	50.00
.0180	#77 .457 mm	.244	6.20 mm	(12x)	3 mm	50 mm	DQW0180-C8	51.40
.0190	.482 mm	.130	3.30 mm	(5x)	3 mm	50 mm	BAF0190-C8	45.60
.0190	.482 mm	.260	6.60 mm	(12x)	3 mm	50 mm	DQW0190-C8	51.40
.0196	.500 mm	.094	2.40 mm	(3x)	3 mm	50 mm	AVA0196-C8	44.00
.0196	.500 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BAF0196-C8	45.10
.0196	.500 mm	.193	4.90 mm	(8x)	3 mm	50 mm	CBG0196-C8	48.20
.0196	.500 mm	.228	5.80 mm	(10x)	3 mm	50 mm	ERY0196-C8	49.30
.0196	.500 mm	.268	6.80 mm	(12x)	3 mm	50 mm	DQW0196-C8	50.70
.0200	#76 .508 mm	.094	2.40 mm	(3x)	3 mm	50 mm	AVA0200-C8	44.00
.0200	#76 .508 mm	.134	3.40 mm	(5x)	3 mm	50 mm	BAF0200-C8	45.10
.0200	#76 .508 mm	.197	5.00 mm	(8x)	3 mm	50 mm	CBG0200-C8	48.20
.0200	#76 .508 mm	.236	6.00 mm	(10x)	3 mm	50 mm	ERY0200-C8	49.30
.0200	#76 .508 mm	.276	7.00 mm	(12x)	3 mm	50 mm	DQW0200-C8	50.70
.0210	#75 .533 mm	.098	2.50 mm	(3x)	3 mm	50 mm	AVA0210-C8	44.00
.0210	#75 .533 mm	.142	3.60 mm	(5x)	3 mm	50 mm	BAF0210-C8	45.10
.0210	#75 .533 mm	.205	5.20 mm	(8x)	3 mm	50 mm	CBG0210-C8	48.20
.0210	#75 .533 mm	.244	6.20 mm	(10x)	3 mm	50 mm	ERY0210-C8	49.30
.0210	#75 .533 mm	.291	7.40 mm	(12x)	3 mm	50 mm	DQW0210-C8	50.70

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ALUMINUM ALLOYS

MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+.000mm} -.013mm		L ₂ ^{+.25mm} -.00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.0220		.558 mm	.150	3.80 mm	(5x)	3 mm	50 mm	BAF0220-C8	45.10
.0220		.558 mm	.299	7.60 mm	(12x)	3 mm	50 mm	DQW0220-C8	50.70
.0225	#74	.571 mm	.106	2.70 mm	(3x)	3 mm	50 mm	AVA0225-C8	44.00
.0225	#74	.571 mm	.154	3.90 mm	(5x)	3 mm	50 mm	BAF0225-C8	45.10
.0225	#74	.571 mm	.220	5.60 mm	(8x)	3 mm	50 mm	CBG0225-C8	48.20
.0225	#74	.571 mm	.268	6.80 mm	(10x)	3 mm	50 mm	ERY0225-C8	49.30
.0225	#74	.571 mm	.307	7.80 mm	(12x)	3 mm	50 mm	DQW0225-C8	50.70
.0230		.584 mm	.154	3.90 mm	(5x)	3 mm	50 mm	BAF0230-C8	45.10
.0230		.584 mm	.315	8.00 mm	(12x)	3 mm	50 mm	DQW0230-C8	50.70
.0236		.600 mm	.157	4.00 mm	(5x)	3 mm	50 mm	BAF0236-C8	45.10
.0236		.600 mm	.323	8.20 mm	(12x)	3 mm	50 mm	DQW0236-C8	50.70
.0240	#73	.609 mm	.114	2.90 mm	(3x)	3 mm	50 mm	AVA0240-C8	44.00
.0240	#73	.609 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BAF0240-C8	45.10
.0240	#73	.609 mm	.236	6.00 mm	(8x)	3 mm	50 mm	CBG0240-C8	48.20
.0240	#73	.609 mm	.283	7.20 mm	(10x)	3 mm	50 mm	ERY0240-C8	49.30
.0240	#73	.609 mm	.331	8.40 mm	(12x)	3 mm	50 mm	DQW0240-C8	50.70
.0250	#72	.635 mm	.118	3.00 mm	(3x)	3 mm	50 mm	AVA0250-C8	44.00
.0250	#72	.635 mm	.165	4.20 mm	(5x)	3 mm	50 mm	BAF0250-C8	45.10
.0250	#72	.635 mm	.244	6.20 mm	(8x)	3 mm	50 mm	CBG0250-C8	48.20
.0250	#72	.635 mm	.291	7.40 mm	(10x)	3 mm	50 mm	ERY0250-C8	49.30
.0250	#72	.635 mm	.346	8.80 mm	(12x)	3 mm	50 mm	DQW0250-C8	50.70
.0260	#71	.660 mm	.122	3.10 mm	(3x)	3 mm	50 mm	AVA0260-C8	44.00
.0260	#71	.660 mm	.173	4.40 mm	(5x)	3 mm	50 mm	BAF0260-C8	45.10
.0260	#71	.660 mm	.252	6.40 mm	(8x)	3 mm	50 mm	CBG0260-C8	48.20
.0260	#71	.660 mm	.307	7.80 mm	(10x)	3 mm	50 mm	ERY0260-C8	49.30
.0260	#71	.660 mm	.354	9.00 mm	(12x)	3 mm	50 mm	DQW0260-C8	50.70
.0270		.685 mm	.181	4.60 mm	(5x)	3 mm	50 mm	BAF0270-C8	45.10
.0270		.685 mm	.370	9.40 mm	(12x)	3 mm	50 mm	DQW0270-C8	50.70
.0275		.700 mm	.189	4.80 mm	(5x)	3 mm	50 mm	BAF0275-C8	45.10
.0275		.700 mm	.378	9.60 mm	(12x)	3 mm	50 mm	DQW0275-C8	50.70
.0280	#70	.711 mm	.134	3.40 mm	(3x)	3 mm	50 mm	AVA0280-C8	44.00
.0280	#70	.711 mm	.189	4.80 mm	(5x)	3 mm	50 mm	BAF0280-C8	45.10
.0280	#70	.711 mm	.276	7.00 mm	(8x)	3 mm	50 mm	CBG0280-C8	48.20
.0280	#70	.711 mm	.331	8.40 mm	(10x)	3 mm	50 mm	ERY0280-C8	49.30
.0280	#70	.711 mm	.386	9.80 mm	(12x)	3 mm	50 mm	DQW0280-C8	50.70
.0292	#69	.741 mm	.138	3.50 mm	(3x)	3 mm	50 mm	AVA0292-C8	44.00
.0292	#69	.741 mm	.197	5.00 mm	(5x)	3 mm	50 mm	BAF0292-C8	45.10
.0292	#69	.741 mm	.283	7.20 mm	(8x)	3 mm	50 mm	CBG0292-C8	48.20
.0292	#69	.741 mm	.346	8.80 mm	(10x)	3 mm	50 mm	ERY0292-C8	49.30
.0292	#69	.741 mm	.394	10.00 mm	(12x)	3 mm	50 mm	DQW0292-C8	50.70
.0300		.762 mm	.205	5.20 mm	(5x)	3 mm	50 mm	BAF0300-C8	45.10
.0300		.762 mm	.413	10.50 mm	(12x)	3 mm	50 mm	DQW0300-C8	50.70
.0310	#68	.787 mm	.146	3.70 mm	(3x)	3 mm	50 mm	AVA0310-C8	44.00
.0310	#68	.787 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BAF0310-C8	45.10
.0310	#68	.787 mm	.299	7.60 mm	(8x)	3 mm	50 mm	CBG0310-C8	48.20
.0310	#68	.787 mm	.362	9.20 mm	(10x)	3 mm	50 mm	ERY0310-C8	49.80
.0310	#68	.787 mm	.433	11.00 mm	(12x)	3 mm	50 mm	DQW0310-C8	51.40
.0312 (1/32)		.793 mm	.150	3.80 mm	(3x)	3 mm	50 mm	AVA0312-C8	44.00
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BAF0312-C8	45.10

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MINIATURE HIGH PERFORMANCE DRILLS
Aluminum Alloys (cont.)

ALUMINUM ALLOYS

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DRILL DIAMETER		FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	metric	inch	metric	hole depth				
	D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.0312 (1/32)	.793 mm	.307	7.80 mm	(8x)	3 mm	50 mm	CBG0312-C8	48.20
.0312 (1/32)	.793 mm	.370	9.40 mm	(10x)	3 mm	50 mm	ERY0312-C8	49.80
.0312 (1/32)	.793 mm	.433	11.00 mm	(12x)	3 mm	50 mm	DQW0312-C8	51.40
.0315	.800 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BAF0315-C8	45.10
.0315	.800 mm	.433	11.00 mm	(12x)	3 mm	50 mm	DQW0315-C8	51.40
.0320	#67 .812 mm	.154	3.90 mm	(3x)	3 mm	50 mm	AVA0320-C8	44.00
.0320	#67 .812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BAF0320-C8	45.10
.0320	#67 .812 mm	.315	8.00 mm	(8x)	3 mm	50 mm	CBG0320-C8	48.20
.0320	#67 .812 mm	.378	9.60 mm	(10x)	3 mm	50 mm	ERY0320-C8	49.80
.0320	#67 .812 mm	.433	11.00 mm	(12x)	3 mm	50 mm	DQW0320-C8	51.40
.0330	#66 .838 mm	.157	4.00 mm	(3x)	3 mm	50 mm	AVA0330-C8	44.00
.0330	#66 .838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	BAF0330-C8	45.10
.0330	#66 .838 mm	.323	8.20 mm	(8x)	3 mm	50 mm	CBG0330-C8	48.20
.0330	#66 .838 mm	.386	9.80 mm	(10x)	3 mm	50 mm	ERY0330-C8	49.80
.0330	#66 .838 mm	.453	11.50 mm	(12x)	3 mm	50 mm	DQW0330-C8	51.40
.0350	#65 .889 mm	.165	4.20 mm	(3x)	3 mm	50 mm	AVA0350-C8	44.00
.0350	#65 .889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BAF0350-C8	45.10
.0350	#65 .889 mm	.339	8.60 mm	(8x)	3 mm	50 mm	CBG0350-C8	48.20
.0350	#65 .889 mm	.413	10.50 mm	(10x)	3 mm	50 mm	ERY0350-C8	49.80
.0350	#65 .889 mm	.472	12.00 mm	(12x)	3 mm	50 mm	DQW0350-C8	51.40
.0354	.900 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BAF0354-C8	45.10
.0354	.900 mm	.492	12.50 mm	(12x)	3 mm	50 mm	DQW0354-C8	51.40
.0360	#64 .914 mm	.173	4.40 mm	(3x)	3 mm	50 mm	AVA0360-C8	44.00
.0360	#64 .914 mm	.244	6.20 mm	(5x)	3 mm	50 mm	BAF0360-C8	45.10
.0360	#64 .914 mm	.354	9.00 mm	(8x)	3 mm	50 mm	CBG0360-C8	48.20
.0360	#64 .914 mm	.413	10.50 mm	(10x)	3 mm	50 mm	ERY0360-C8	49.80
.0360	#64 .914 mm	.492	12.50 mm	(12x)	3 mm	50 mm	DQW0360-C8	51.40
.0370	#63 .939 mm	.173	4.40 mm	(3x)	3 mm	50 mm	AVA0370-C8	44.00
.0370	#63 .939 mm	.252	6.40 mm	(5x)	3 mm	50 mm	BAF0370-C8	45.10
.0370	#63 .939 mm	.362	9.20 mm	(8x)	3 mm	50 mm	CBG0370-C8	48.20
.0370	#63 .939 mm	.433	11.00 mm	(10x)	3 mm	50 mm	ERY0370-C8	49.80
.0370	#63 .939 mm	.512	13.00 mm	(12x)	3 mm	50 mm	DQW0370-C8	51.40
.0380	#62 .965 mm	.181	4.60 mm	(3x)	3 mm	50 mm	AVA0380-C8	44.00
.0380	#62 .965 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BAF0380-C8	45.10
.0380	#62 .965 mm	.370	9.40 mm	(8x)	3 mm	50 mm	CBG0380-C8	48.20
.0380	#62 .965 mm	.453	11.50 mm	(10x)	3 mm	50 mm	ERY0380-C8	49.80
.0380	#62 .965 mm	.531	13.50 mm	(12x)	3 mm	50 mm	DQW0380-C8	51.40
.0390	#61 .990 mm	.189	4.80 mm	(3x)	3 mm	50 mm	AVA0390-C8	44.00
.0390	#61 .990 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BAF0390-C8	45.10
.0390	#61 .990 mm	.378	9.60 mm	(8x)	3 mm	50 mm	CBG0390-C8	48.20
.0390	#61 .990 mm	.453	11.50 mm	(10x)	3 mm	50 mm	ERY0390-C8	49.80
.0390	#61 .990 mm	.531	13.50 mm	(12x)	3 mm	50 mm	DQW0390-C8	51.40
.0393	1.000 mm	.189	4.80 mm	(3x)	3 mm	50 mm	AVA0393-C8	45.90
.0393	1.000 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BAF0393-C8	47.00
.0393	1.000 mm	.386	9.80 mm	(8x)	3 mm	50 mm	CBG0393-C8	49.40
.0393	1.000 mm	.472	12.00 mm	(10x)	3 mm	50 mm	ERY0393-C8	51.00
.0393	1.000 mm	.551	14.00 mm	(12x)	3 mm	50 mm	DQW0393-C8	52.40

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MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.0400	#60	1.016 mm	.189	4.80 mm	(3x)	3 mm	50 mm	AVA0400-C8	45.90
.0400	#60	1.016 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BAF0400-C8	47.00
.0400	#60	1.016 mm	.394	10.00 mm	(8x)	3 mm	50 mm	CBG0400-C8	49.40
.0400	#60	1.016 mm	.472	12.00 mm	(10x)	3 mm	50 mm	ERY0400-C8	51.00
.0400	#60	1.016 mm	.551	14.00 mm	(12x)	3 mm	50 mm	DQW0400-C8	52.40
.0410	#59	1.041 mm	.197	5.00 mm	(3x)	3 mm	50 mm	AVA0410-C8	45.90
.0410	#59	1.041 mm	.276	7.00 mm	(5x)	3 mm	50 mm	BAF0410-C8	47.00
.0410	#59	1.041 mm	.394	10.00 mm	(8x)	3 mm	50 mm	CBG0410-C8	49.40
.0410	#59	1.041 mm	.472	12.00 mm	(10x)	3 mm	50 mm	ERY0410-C8	51.00
.0410	#59	1.041 mm	.571	14.50 mm	(12x)	3 mm	50 mm	DQW0410-C8	52.40
.0420	#58	1.066 mm	.197	5.00 mm	(3x)	3 mm	50 mm	AVA0420-C8	45.90
.0420	#58	1.066 mm	.283	7.20 mm	(5x)	3 mm	50 mm	BAF0420-C8	47.00
.0420	#58	1.066 mm	.413	10.50 mm	(8x)	3 mm	50 mm	CBG0420-C8	49.40
.0420	#58	1.066 mm	.492	12.50 mm	(10x)	3 mm	50 mm	ERY0420-C8	51.00
.0420	#58	1.066 mm	.571	14.50 mm	(12x)	3 mm	50 mm	DQW0420-C8	52.40
.0430	#57	1.092 mm	.205	5.20 mm	(3x)	3 mm	50 mm	AVA0430-C8	45.90
.0430	#57	1.092 mm	.291	7.40 mm	(5x)	3 mm	50 mm	BAF0430-C8	47.00
.0430	#57	1.092 mm	.413	10.50 mm	(8x)	3 mm	50 mm	CBG0430-C8	49.40
.0430	#57	1.092 mm	.512	13.00 mm	(10x)	3 mm	50 mm	ERY0430-C8	51.00
.0430	#57	1.092 mm	.591	15.00 mm	(12x)	3 mm	50 mm	DQW0430-C8	52.40
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	BAF0450-C8	47.00
.0450		1.143 mm	.610	15.50 mm	(12x)	3 mm	50 mm	DQW0450-C8	52.40
.0465	#56	1.181 mm	.220	5.60 mm	(3x)	3 mm	50 mm	AVA0465-C8	45.90
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BAF0465-C8	47.00
.0465	#56	1.181 mm	.453	11.50 mm	(8x)	3 mm	50 mm	CBG0465-C8	49.40
.0465	#56	1.181 mm	.551	14.00 mm	(10x)	3 mm	50 mm	ERY0465-C8	51.00
.0465	#56	1.181 mm	.630	16.00 mm	(12x)	3 mm	63 mm	DQW0465-C8	52.40
.0468 (3/64)		1.190 mm	.220	5.60 mm	(3x)	3 mm	50 mm	AVA0468-C8	45.90
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BAF0468-C8	47.00
.0468 (3/64)		1.190 mm	.453	11.50 mm	(8x)	3 mm	50 mm	CBG0468-C8	49.40
.0468 (3/64)		1.190 mm	.551	14.00 mm	(10x)	3 mm	50 mm	ERY0468-C8	51.00
.0468 (3/64)		1.190 mm	.650	16.50 mm	(12x)	3 mm	63 mm	DQW0468-C8	52.40
.0492		1.250 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BAF0492-C8	47.00
.0492		1.250 mm	.669	17.00 mm	(12x)	3 mm	63 mm	DQW0492-C8	52.40
.0500		1.270 mm	.236	6.00 mm	(3x)	3 mm	50 mm	AVA0500-C8	45.90
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BAF0500-C8	47.00
.0500		1.270 mm	.492	12.50 mm	(8x)	3 mm	50 mm	CBG0500-C8	49.40
.0500		1.270 mm	.591	15.00 mm	(10x)	3 mm	50 mm	ERY0500-C8	51.00
.0500		1.270 mm	.689	17.50 mm	(12x)	3 mm	63 mm	DQW0500-C8	52.40
.0520	#55	1.320 mm	.244	6.20 mm	(3x)	3 mm	50 mm	AVA0520-C8	45.90
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	BAF0520-C8	47.00
.0520	#55	1.320 mm	.512	13.00 mm	(8x)	3 mm	50 mm	CBG0520-C8	49.40
.0520	#55	1.320 mm	.610	15.50 mm	(10x)	3 mm	50 mm	ERY0520-C8	51.00
.0520	#55	1.320 mm	.709	18.00 mm	(12x)	3 mm	63 mm	DQW0520-C8	52.40
.0550	#54	1.397 mm	.260	6.60 mm	(3x)	3 mm	50 mm	AVA0550-C8	45.90
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	BAF0550-C8	47.00
.0550	#54	1.397 mm	.531	13.50 mm	(8x)	3 mm	50 mm	CBG0550-C8	49.40

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MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
D ₁ ^{+ .000mm} _{-.013mm}			L ₂ ^{+ .25mm} _{-.00mm}			D ₂ (h6)	L ₁	3 FL	PRICE
.0550	#54	1.397 mm	.650	16.50 mm	(10x)	3 mm	63 mm	ERY0550-C8	51.00
.0550	#54	1.397 mm	.748	19.00 mm	(12x)	3 mm	63 mm	DQW0550-C8	52.40
.0590		1.500 mm	.283	7.20 mm	(3x)	3 mm	50 mm	AVA0590-C8	46.40
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BAF0590-C8	47.50
.0590		1.500 mm	.571	14.50 mm	(8x)	3 mm	50 mm	CBG0590-C8	49.40
.0590		1.500 mm	.689	17.50 mm	(10x)	3 mm	63 mm	ERY0590-C8	51.50
.0590		1.500 mm	.827	21.00 mm	(12x)	3 mm	63 mm	DQW0590-C8	53.40
.0595	#53	1.511 mm	.283	7.20 mm	(3x)	3 mm	50 mm	AVA0595-C8	46.40
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BAF0595-C8	47.50
.0595	#53	1.511 mm	.571	14.50 mm	(8x)	3 mm	50 mm	CBG0595-C8	49.40
.0595	#53	1.511 mm	.709	18.00 mm	(10x)	3 mm	63 mm	ERY0595-C8	51.50
.0595	#53	1.511 mm	.827	21.00 mm	(12x)	3 mm	63 mm	DQW0595-C8	53.40
.0600		1.524 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BAF0600-C8	47.50
.0600		1.524 mm	.827	21.00 mm	(12x)	3 mm	63 mm	DQW0600-C8	53.40
.0625 (1/16)		1.587 mm	.299	7.60 mm	(3x)	3 mm	50 mm	AVA0625-C8	46.40
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BAF0625-C8	47.50
.0625 (1/16)		1.587 mm	.610	15.50 mm	(8x)	3 mm	50 mm	CBG0625-C8	50.40
.0625 (1/16)		1.587 mm	.728	18.50 mm	(10x)	3 mm	63 mm	ERY0625-C8	51.80
.0625 (1/16)		1.587 mm	.866	22.00 mm	(12x)	3 mm	63 mm	DQW0625-C8	53.40
.0635	#52	1.612 mm	.299	7.60 mm	(3x)	3 mm	50 mm	AVA0635-C8	46.40
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	BAF0635-C8	47.50
.0635	#52	1.612 mm	.610	15.50 mm	(8x)	3 mm	50 mm	CBG0635-C8	50.40
.0635	#52	1.612 mm	.748	19.00 mm	(10x)	3 mm	63 mm	ERY0635-C8	51.80
.0635	#52	1.612 mm	.866	22.00 mm	(12x)	3 mm	63 mm	DQW0635-C8	53.40
.0670	#51	1.701 mm	.315	8.00 mm	(3x)	3 mm	50 mm	AVA0670-C8	46.40
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	BAF0670-C8	47.50
.0670	#51	1.701 mm	.650	16.50 mm	(8x)	3 mm	63 mm	CBG0670-C8	50.40
.0670	#51	1.701 mm	.787	20.00 mm	(10x)	3 mm	63 mm	ERY0670-C8	51.80
.0670	#51	1.701 mm	.906	23.00 mm	(12x)	3 mm	63 mm	DQW0670-C8	53.40
.0700	#50	1.778 mm	.335	8.50 mm	(3x)	3 mm	50 mm	AVA0700-C8	46.40
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	BAF0700-C8	47.50
.0700	#50	1.778 mm	.689	17.50 mm	(8x)	3 mm	63 mm	CBG0700-C8	50.40
.0700	#50	1.778 mm	.827	21.00 mm	(10x)	3 mm	63 mm	ERY0700-C8	51.80
.0700	#50	1.778 mm	.945	24.00 mm	(12x)	3 mm	63 mm	DQW0700-C8	53.40
.0730	#49	1.854 mm	.354	9.00 mm	(3x)	3 mm	50 mm	AVA0730-C8	46.40
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	BAF0730-C8	47.50
.0730	#49	1.854 mm	.709	18.00 mm	(8x)	3 mm	63 mm	CBG0730-C8	50.40
.0730	#49	1.854 mm	.866	22.00 mm	(10x)	3 mm	63 mm	ERY0730-C8	51.80
.0730	#49	1.854 mm	.984	25.00 mm	(12x)	3 mm	63 mm	DQW0730-C8	53.40
.0760	#48	1.930 mm	.354	9.00 mm	(3x)	3 mm	50 mm	AVA0760-C8	46.40
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	BAF0760-C8	47.50
.0760	#48	1.930 mm	.748	19.00 mm	(8x)	3 mm	63 mm	CBG0760-C8	50.40
.0760	#48	1.930 mm	.906	23.00 mm	(10x)	3 mm	63 mm	ERY0760-C8	51.80
.0760	#48	1.930 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	DQW0760-C8	53.40
.0781 (5/64)		1.984 mm	.374	9.50 mm	(3x)	3 mm	50 mm	AVA0781-C8	46.40
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BAF0781-C8	47.50
.0781 (5/64)		1.984 mm	.768	19.50 mm	(8x)	3 mm	63 mm	CBG0781-C8	50.40

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MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
D ₁ ^{+ .000mm} _{-.013mm}			L ₂ ^{+ .25mm} _{-.00mm}			D ₂ (h6)	L ₁	3 FL	PRICE
.0781 (5/64)		1.984 mm	.906	23.00 mm	(10x)	3 mm	63 mm	ERY0781-C8	51.80
.0781 (5/64)		1.984 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	DQW0781-C8	53.40
.0785	#47	1.993 mm	.374	9.50 mm	(3x)	3 mm	50 mm	AVA0785-C8	46.40
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BAF0785-C8	47.50
.0785	#47	1.993 mm	.768	19.50 mm	(8x)	3 mm	63 mm	CBG0785-C8	50.40
.0785	#47	1.993 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	DQW0785-C8	53.40
.0787		2.000 mm	.374	9.50 mm	(3x)	4 mm	50 mm	AVA0787-C8	47.70
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BAF0787-C8	48.70
.0787		2.000 mm	.768	19.50 mm	(8x)	4 mm	63 mm	CBG0787-C8	51.50
.0787		2.000 mm	.945	24.00 mm	(10x)	4 mm	63 mm	ERY0787-C8	52.90
.0787		2.000 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	DQW0787-C8	54.40
.0800		2.032 mm	.374	9.50 mm	(3x)	4 mm	50 mm	AVA0800-C8	47.70
.0800		2.032 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BAF0800-C8	48.70
.0800		2.032 mm	.787	20.00 mm	(8x)	4 mm	63 mm	CBG0800-C8	51.50
.0800		2.032 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	DQW0800-C8	54.40
.0810	#46	2.057 mm	.394	10.00 mm	(3x)	4 mm	50 mm	AVA0810-C8	47.70
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BAF0810-C8	48.70
.0810	#46	2.057 mm	.787	20.00 mm	(8x)	4 mm	63 mm	CBG0810-C8	51.50
.0810	#46	2.057 mm	.945	24.00 mm	(10x)	4 mm	63 mm	ERY0810-C8	52.90
.0810	#46	2.057 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	DQW0810-C8	54.40
.0820	#45	2.082 mm	.394	10.00 mm	(3x)	4 mm	50 mm	AVA0820-C8	47.70
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BAF0820-C8	48.70
.0820	#45	2.082 mm	.787	20.00 mm	(8x)	4 mm	63 mm	CBG0820-C8	51.50
.0820	#45	2.082 mm	1.142	29.00 mm	(12x)	4 mm	75 mm	DQW0820-C8	54.40
.0860	#44	2.184 mm	.413	10.50 mm	(3x)	4 mm	50 mm	AVA0860-C8	47.70
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	BAF0860-C8	48.70
.0860	#44	2.184 mm	.827	21.00 mm	(8x)	4 mm	63 mm	CBG0860-C8	51.50
.0860	#44	2.184 mm	1.024	26.00 mm	(10x)	4 mm	63 mm	ERY0860-C8	52.90
.0860	#44	2.184 mm	1.181	30.00 mm	(12x)	4 mm	75 mm	DQW0860-C8	54.40
.0890	#43	2.260 mm	.413	10.50 mm	(3x)	4 mm	50 mm	AVA0890-C8	47.70
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BAF0890-C8	48.70
.0890	#43	2.260 mm	.866	22.00 mm	(8x)	4 mm	63 mm	CBG0890-C8	51.50
.0890	#43	2.260 mm	1.063	27.00 mm	(10x)	4 mm	63 mm	ERY0890-C8	52.90
.0890	#43	2.260 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	DQW0890-C8	54.40
.0900		2.286 mm	.433	11.00 mm	(3x)	4 mm	50 mm	AVA0900-C8	47.70
.0900		2.286 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BAF0900-C8	48.70
.0900		2.286 mm	.866	22.00 mm	(8x)	4 mm	63 mm	CBG0900-C8	51.50
.0900		2.286 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	DQW0900-C8	54.40
.0935	#42	2.374 mm	.453	11.50 mm	(3x)	4 mm	50 mm	AVA0935-C8	47.70
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BAF0935-C8	48.70
.0935	#42	2.374 mm	.906	23.00 mm	(8x)	4 mm	63 mm	CBG0935-C8	51.50
.0935	#42	2.374 mm	1.102	28.00 mm	(10x)	4 mm	63 mm	ERY0935-C8	52.90
.0935	#42	2.374 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	DQW0935-C8	54.40
.0937 (3/32)		2.381 mm	.453	11.50 mm	(3x)	4 mm	50 mm	AVA0937-C8	47.70
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BAF0937-C8	48.70
.0937 (3/32)		2.381 mm	.906	23.00 mm	(8x)	4 mm	63 mm	CBG0937-C8	51.50
.0937 (3/32)		2.381 mm	1.102	28.00 mm	(10x)	4 mm	63 mm	ERY0937-C8	52.90
.0937 (3/32)		2.381 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	DQW0937-C8	54.40

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ALUMINUM ALLOYS

MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

ALUMINUM ALLOYS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.0960	#41	2.438 mm	.453	11.50 mm	(3x)	4 mm	50 mm	AVA0960-C8	47.70
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BAF0960-C8	48.70
.0960	#41	2.438 mm	.945	24.00 mm	(8x)	4 mm	63 mm	CBG0960-C8	51.50
.0960	#41	2.438 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	ERY0960-C8	52.90
.0960	#41	2.438 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	DQW0960-C8	54.40
.0980	#40	2.489 mm	.472	12.00 mm	(3x)	4 mm	50 mm	AVA0980-C8	47.70
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BAF0980-C8	48.70
.0980	#40	2.489 mm	.945	24.00 mm	(8x)	4 mm	63 mm	CBG0980-C8	51.50
.0980	#40	2.489 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	ERY0980-C8	52.90
.0980	#40	2.489 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	DQW0980-C8	54.40
.0984		2.500 mm	.472	12.00 mm	(3x)	4 mm	50 mm	AVA0984-C8	48.10
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BAF0984-C8	49.10
.0984		2.500 mm	.945	24.00 mm	(8x)	4 mm	63 mm	CBG0984-C8	51.90
.0984		2.500 mm	1.142	29.00 mm	(10x)	4 mm	75 mm	ERY0984-C8	53.40
.0984		2.500 mm	1.339	34.00 mm	(12x)	4 mm	75 mm	DQW0984-C8	54.70
.0995	#39	2.527 mm	.472	12.00 mm	(3x)	4 mm	50 mm	AVA0995-C8	48.10
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BAF0995-C8	49.10
.0995	#39	2.527 mm	.984	25.00 mm	(8x)	4 mm	63 mm	CBG0995-C8	51.90
.0995	#39	2.527 mm	1.181	30.00 mm	(10x)	4 mm	75 mm	ERY0995-C8	53.40
.0995	#39	2.527 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	DQW0995-C8	54.70
.1000		2.540 mm	.472	12.00 mm	(3x)	4 mm	50 mm	AVA1000-C8	48.10
.1000		2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BAF1000-C8	49.10
.1000		2.540 mm	.984	25.00 mm	(8x)	4 mm	63 mm	CBG1000-C8	51.90
.1000		2.540 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	DQW1000-C8	54.70
.1015	#38	2.578 mm	.472	12.00 mm	(3x)	4 mm	50 mm	AVA1015-C8	48.10
.1015	#38	2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BAF1015-C8	49.10
.1015	#38	2.578 mm	.984	25.00 mm	(8x)	4 mm	63 mm	CBG1015-C8	51.90
.1015	#38	2.578 mm	1.181	30.00 mm	(10x)	4 mm	75 mm	ERY1015-C8	53.40
.1015	#38	2.578 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	DQW1015-C8	54.70
.1040	#37	2.641 mm	.492	12.50 mm	(3x)	4 mm	50 mm	AVA1040-C8	48.10
.1040	#37	2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BAF1040-C8	49.10
.1040	#37	2.641 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	CBG1040-C8	51.90
.1040	#37	2.641 mm	1.220	31.00 mm	(10x)	4 mm	75 mm	ERY1040-C8	53.40
.1040	#37	2.641 mm	1.417	36.00 mm	(12x)	4 mm	75 mm	DQW1040-C8	54.70
.1065	#36	2.705 mm	.512	13.00 mm	(3x)	4 mm	50 mm	AVA1065-C8	48.10
.1065	#36	2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BAF1065-C8	49.10
.1065	#36	2.705 mm	1.024	26.00 mm	(8x)	4 mm	63 mm	CBG1065-C8	51.90
.1065	#36	2.705 mm	1.260	32.00 mm	(10x)	4 mm	75 mm	ERY1065-C8	53.40
.1065	#36	2.705 mm	1.457	37.00 mm	(12x)	4 mm	75 mm	DQW1065-C8	54.70
.1093 (7/64)		2.778 mm	.512	13.00 mm	(3x)	4 mm	50 mm	AVA1093-C8	48.10
.1093 (7/64)		2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BAF1093-C8	49.10
.1093 (7/64)		2.778 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	CBG1093-C8	51.90
.1093 (7/64)		2.778 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	ERY1093-C8	53.40
.1093 (7/64)		2.778 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	DQW1093-C8	54.70
.1100	#35	2.794 mm	.531	13.50 mm	(3x)	4 mm	50 mm	AVA1100-C8	48.10
.1100	#35	2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BAF1100-C8	49.10
.1100	#35	2.794 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	CBG1100-C8	51.90
.1100	#35	2.794 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	ERY1100-C8	53.40

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MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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ALUMINUM ALLOYS

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
D ₁ ^{+0.00mm} / _{-.013mm}			L ₂ ^{+0.25mm} / _{-.00mm}			D ₂ (h6)	L ₁	3 FL	PRICE
.1100	#35	2.794 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	DQW1100-C8	54.70
.1110	#34	2.819 mm	.531	13.50 mm	(3x)	4 mm	50 mm	AVA1110-C8	48.10
.1110	#34	2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BAF1110-C8	49.10
.1110	#34	2.819 mm	1.063	27.00 mm	(8x)	4 mm	63 mm	CBG1110-C8	51.90
.1110	#34	2.819 mm	1.299	33.00 mm	(10x)	4 mm	75 mm	ERY1110-C8	53.40
.1110	#34	2.819 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	DQW1110-C8	54.70
.1130	#33	2.870 mm	.531	13.50 mm	(3x)	4 mm	50 mm	AVA1130-C8	48.10
.1130	#33	2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BAF1130-C8	49.10
.1130	#33	2.870 mm	1.102	28.00 mm	(8x)	4 mm	63 mm	CBG1130-C8	51.90
.1130	#33	2.870 mm	1.339	34.00 mm	(10x)	4 mm	75 mm	ERY1130-C8	53.40
.1130	#33	2.870 mm	1.535	39.00 mm	(12x)	4 mm	75 mm	DQW1130-C8	54.70
.1160	#32	2.946 mm	.551	14.00 mm	(3x)	4 mm	50 mm	AVA1160-C8	48.10
.1160	#32	2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BAF1160-C8	49.10
.1160	#32	2.946 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	CBG1160-C8	51.90
.1160	#32	2.946 mm	1.575	40.00 mm	(12x)	4 mm	75 mm	DQW1160-C8	54.70
.1181		3.000 mm	.571	14.50 mm	(3x)	4 mm	50 mm	AVA1181-C8	49.10
.1181		3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BAF1181-C8	50.40
.1181		3.000 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	CBG1181-C8	52.90
.1181		3.000 mm	1.378	35.00 mm	(10x)	4 mm	75 mm	ERY1181-C8	54.40
.1181		3.000 mm	1.654	42.00 mm	(12x)	4 mm	100 mm	DQW1181-C8	55.80

D ₁ ^{+0.00mm} / _{-.013mm}			L ₂ ^{+0.75mm} / _{-.00mm}			D ₂ (h6)	L ₁	3 FL	PRICE
.1200	#31	3.048 mm	.571	14.50 mm	(3x)	6 mm	63 mm	AVA1200-C8	60.80
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BAF1200-C8	62.10
.1200	#31	3.048 mm	1.181	30.00 mm	(8x)	6 mm	75 mm	CBG1200-C8	63.40
.1200	#31	3.048 mm	1.654	42.00 mm	(12x)	6 mm	100 mm	DQW1200-C8	66.00
.1250 (1/8)		3.175 mm	.591	15.00 mm	(3x)	6 mm	63 mm	AVA1250-C8	60.80
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BAF1250-C8	62.10
.1250 (1/8)		3.175 mm	1.220	31.00 mm	(8x)	6 mm	75 mm	CBG1250-C8	63.40
.1250 (1/8)		3.175 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	DQW1250-C8	66.00
.1260		3.200 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BAF1260-C8	62.10
.1260		3.200 mm	1.220	31.00 mm	(8x)	6 mm	75 mm	CBG1260-C8	66.00
.1285	#30	3.263 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BAF1285-C8	62.10
.1285	#30	3.263 mm	1.732	44.00 mm	(12x)	6 mm	100 mm	DQW1285-C8	66.00
.1360	#29	3.454 mm	.630	16.00 mm	(3x)	6 mm	63 mm	AVA1360-C8	60.80
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	BAF1360-C8	62.10
.1360	#29	3.454 mm	1.339	34.00 mm	(8x)	6 mm	75 mm	CBG1360-C8	63.40
.1360	#29	3.454 mm	1.575	40.00 mm	(10x)	6 mm	100 mm	ERY1360-C8	64.70
.1360	#29	3.454 mm	1.890	48.00 mm	(12x)	6 mm	100 mm	DQW1360-C8	66.00
.1405	#28	3.568 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BAF1405-C8	62.10
.1405	#28	3.568 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	DQW1405-C8	66.00
.1406 (9/64)		3.571 mm	.669	17.00 mm	(3x)	6 mm	63 mm	AVA1406-C8	60.80
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BAF1406-C8	62.10
.1406 (9/64)		3.571 mm	1.378	35.00 mm	(8x)	6 mm	75 mm	CBG1406-C8	63.40
.1406 (9/64)		3.571 mm	1.654	42.00 mm	(10x)	6 mm	100 mm	ERY1406-C8	64.70
.1406 (9/64)		3.571 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	DQW1406-C8	66.00
.1440	#27	3.657 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BAF1440-C8	62.10
.1440	#27	3.657 mm	1.969	50.00 mm	(12x)	6 mm	100 mm	DQW1440-C8	66.00

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MINIATURE HIGH PERFORMANCE DRILLS
Aluminum Alloys (cont.)

ALUMINUM ALLOYS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	3 FL	PRICE
.1470	#26	3.733 mm	.709	18.00 mm	(3x)	6 mm	63 mm	AVA1470-C8	60.80
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1470-C8	62.10
.1470	#26	3.733 mm	1.417	36.00 mm	(8x)	6 mm	100 mm	CBG1470-C8	63.40
.1470	#26	3.733 mm	1.732	44.00 mm	(10x)	6 mm	100 mm	ERY1470-C8	64.70
.1470	#26	3.733 mm	2.047	52.00 mm	(12x)	6 mm	100 mm	DQW1470-C8	66.00
.1495	#25	3.797 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1495-C8	62.10
.1495	#25	3.797 mm	2.047	52.00 mm	(12x)	6 mm	100 mm	DQW1495-C8	66.00
.1520	#24	3.860 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1520-C8	62.10
.1520	#24	3.860 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	DQW1520-C8	66.00
.1540	#23	3.911 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1540-C8	62.10
.1540	#23	3.911 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	DQW1540-C8	66.00
.1562 (5/32)		3.968 mm	.748	19.00 mm	(3x)	6 mm	63 mm	AVA1562-C8	60.80
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1562-C8	62.10
.1562 (5/32)		3.968 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	CBG1562-C8	63.40
.1562 (5/32)		3.968 mm	1.811	46.00 mm	(10x)	6 mm	100 mm	ERY1562-C8	64.70
.1562 (5/32)		3.968 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	DQW1562-C8	66.00
.1570	#22	3.987 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BAF1570-C8	62.10
.1570	#22	3.987 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	CBG1570-C8	63.40
.1570	#22	3.987 mm	2.126	54.00 mm	(12x)	6 mm	100 mm	DQW1570-C8	66.00
.1574		4.000 mm	.748	19.00 mm	(3x)	6 mm	63 mm	AVA1574-C8	60.80
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BAF1574-C8	62.10
.1574		4.000 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	CBG1574-C8	63.40
.1574		4.000 mm	1.890	48.00 mm	(10x)	6 mm	100 mm	ERY1574-C8	64.70
.1574		4.000 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	DQW1574-C8	66.00
.1590	#21	4.038 mm	.748	19.00 mm	(3x)	6 mm	63 mm	AVA1590-C8	60.80
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BAF1590-C8	62.10
.1590	#21	4.038 mm	1.535	39.00 mm	(8x)	6 mm	100 mm	CBG1590-C8	63.40
.1590	#21	4.038 mm	1.890	48.00 mm	(10x)	6 mm	100 mm	ERY1590-C8	64.70
.1590	#21	4.038 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	DQW1590-C8	66.00
.1610	#20	4.089 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BAF1610-C8	62.10
.1610	#20	4.089 mm	2.205	56.00 mm	(12x)	6 mm	100 mm	DQW1610-C8	66.00
.1660	#19	4.216 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BAF1660-C8	62.10
.1660	#19	4.216 mm	2.283	58.00 mm	(12x)	6 mm	100 mm	DQW1660-C8	66.00
.1695	#18	4.305 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BAF1695-C8	62.10
.1695	#18	4.305 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	DQW1695-C8	66.00
.1718 (11/64)		4.365 mm	.827	21.00 mm	(3x)	6 mm	63 mm	AVA1718-C8	60.80
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BAF1718-C8	62.10
.1718 (11/64)		4.365 mm	1.654	42.00 mm	(8x)	6 mm	100 mm	CBG1718-C8	63.40
.1718 (11/64)		4.365 mm	2.047	52.00 mm	(10x)	6 mm	100 mm	ERY1718-C8	64.70
.1718 (11/64)		4.365 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	DQW1718-C8	66.00
.1730	#17	4.394 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BAF1730-C8	62.10
.1730	#17	4.394 mm	2.362	60.00 mm	(12x)	6 mm	100 mm	DQW1730-C8	66.00
.1770	#16	4.495 mm	.827	21.00 mm	(3x)	6 mm	63 mm	AVA1770-C8	60.80
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BAF1770-C8	62.10
.1770	#16	4.495 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	CBG1770-C8	63.40
.1770	#16	4.495 mm	2.047	52.00 mm	(10x)	6 mm	100 mm	ERY1770-C8	64.70
.1770	#16	4.495 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	DQW1770-C8	66.00

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MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
D ₁ ^{+0.00mm} _{-.013mm}			L ₂ ^{+0.75mm} _{-.00mm}			D ₂ (h6)	L ₁	3 FL	PRICE
.1800	#15	4.572 mm	.866	22.00 mm	(3x)	6 mm	63 mm	AVA1800-C8	60.80
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BAF1800-C8	62.10
.1800	#15	4.572 mm	1.732	44.00 mm	(8x)	6 mm	100 mm	CBG1800-C8	63.40
.1800	#15	4.572 mm	2.126	54.00 mm	(10x)	6 mm	100 mm	ERY1800-C8	64.70
.1800	#15	4.572 mm	2.441	62.00 mm	(12x)	6 mm	125 mm	DQW1800-C8	66.00
.1820	#14	4.622 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BAF1820-C8	62.10
.1820	#14	4.622 mm	2.520	64.00 mm	(12x)	6 mm	125 mm	DQW1820-C8	66.00
.1850	#13	4.700 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BAF1850-C8	62.10
.1850	#13	4.700 mm	2.520	64.00 mm	(12x)	6 mm	125 mm	DQW1850-C8	66.00
.1875 (3/16)		4.762 mm	.906	23.00 mm	(3x)	6 mm	63 mm	AVA1875-C8	60.80
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BAF1875-C8	62.10
.1875 (3/16)		4.762 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	CBG1875-C8	63.40
.1875 (3/16)		4.762 mm	2.205	56.00 mm	(10x)	6 mm	100 mm	ERY1875-C8	64.70
.1875 (3/16)		4.762 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	DQW1875-C8	66.00
.1890	#12	4.800 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BAF1890-C8	62.10
.1890	#12	4.800 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	DQW1890-C8	66.00
.1910	#11	4.851 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BAF1910-C8	62.10
.1910	#11	4.851 mm	2.598	66.00 mm	(12x)	6 mm	125 mm	DQW1910-C8	66.00
.1935	#10	4.914 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF1935-C8	62.10
.1935	#10	4.914 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	DQW1935-C8	66.00
.1960	#9	4.978 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF1960-C8	62.10
.1960	#9	4.978 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	DQW1960-C8	66.00
.1968		5.000 mm	.945	24.00 mm	(3x)	6 mm	63 mm	AVA1968-C8	60.80
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF1968-C8	62.10
.1968		5.000 mm	1.890	48.00 mm	(8x)	6 mm	100 mm	CBG1968-C8	63.40
.1968		5.000 mm	2.283	58.00 mm	(10x)	6 mm	100 mm	ERY1968-C8	64.70
.1968		5.000 mm	2.677	68.00 mm	(12x)	6 mm	125 mm	DQW1968-C8	66.00
.1990	#8	5.054 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF1990-C8	62.10
.1990	#8	5.054 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	DQW1990-C8	66.00
.2009	#7	5.105 mm	.945	24.00 mm	(3x)	6 mm	63 mm	AVA2009-C8	60.80
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF2009-C8	62.10
.2009	#7	5.105 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	CBG2009-C8	63.40
.2009	#7	5.105 mm	2.362	60.00 mm	(10x)	6 mm	100 mm	ERY2009-C8	64.70
.2009	#7	5.105 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	DQW2009-C8	66.00
.2031 (13/64)		5.159 mm	.945	24.00 mm	(3x)	6 mm	63 mm	AVA2031-C8	60.80
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF2031-C8	62.10
.2031 (13/64)		5.159 mm	1.969	50.00 mm	(8x)	6 mm	100 mm	CBG2031-C8	63.40
.2031 (13/64)		5.159 mm	2.362	60.00 mm	(10x)	6 mm	100 mm	ERY2031-C8	64.70
.2031 (13/64)		5.159 mm	2.756	70.00 mm	(12x)	6 mm	125 mm	DQW2031-C8	66.00
.2040	#6	5.181 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BAF2040-C8	62.10
.2040	#6	5.181 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	DQW2040-C8	66.00
.2055	#5	5.219 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BAF2055-C8	62.10
.2055	#5	5.219 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	DQW2055-C8	66.00
.2090	#4	5.308 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BAF2090-C8	62.10
.2090	#4	5.308 mm	2.835	72.00 mm	(12x)	6 mm	125 mm	DQW2090-C8	66.00
.2129	#3	5.410 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	AVA2129-C8	60.80
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BAF2129-C8	62.10
.2129	#3	5.410 mm	2.047	52.00 mm	(8x)	6 mm	100 mm	CBG2129-C8	63.40
.2129	#3	5.410 mm	2.520	64.00 mm	(10x)	6 mm	125 mm	ERY2129-C8	64.70
.2129	#3	5.410 mm	2.913	74.00 mm	(12x)	6 mm	125 mm	DQW2129-C8	66.00

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MINIATURE HIGH PERFORMANCE DRILLS
Aluminum Alloys (cont.)

ALUMINUM ALLOYS

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+0.00mm} _{-0.013mm}		L ₂ ^{+0.75mm} _{-0.00mm}		D ₂ (h6)	L ₁	3 FL	PRICE
.2187 (7/32)		5.556 mm	1.024	26.00 mm	(3x)	6 mm	75 mm	AVA2187-C8	60.80
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BAF2187-C8	62.10
.2187 (7/32)		5.556 mm	2.126	54.00 mm	(8x)	6 mm	100 mm	CBG2187-C8	63.40
.2187 (7/32)		5.556 mm	2.598	66.00 mm	(10x)	6 mm	125 mm	ERY2187-C8	64.70
.2187 (7/32)		5.556 mm	2.992	76.00 mm	(12x)	6 mm	125 mm	DQW2187-C8	66.00
.2210	#2	5.613 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BAF2210-C8	62.10
.2210	#2	5.613 mm	3.071	78.00 mm	(12x)	6 mm	125 mm	DQW2210-C8	66.00
.2280	#1	5.791 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BAF2280-C8	62.10
.2280	#1	5.791 mm	3.150	80.00 mm	(12x)	6 mm	125 mm	DQW2280-C8	66.00
.2340	A	5.943 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BAF2340-C8	62.10
.2340	A	5.943 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	DQW2340-C8	66.00
.2343 (15/64)		5.953 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	AVA2343-C8	60.80
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BAF2343-C8	62.10
.2343 (15/64)		5.953 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	CBG2343-C8	63.40
.2343 (15/64)		5.953 mm	2.756	70.00 mm	(10x)	6 mm	125 mm	ERY2343-C8	64.70
.2343 (15/64)		5.953 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	DQW2343-C8	66.00
.2362		6.000 mm	1.102	28.00 mm	(3x)	6 mm	75 mm	AVA2362-C8	60.80
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BAF2362-C8	62.10
.2362		6.000 mm	2.283	58.00 mm	(8x)	6 mm	100 mm	CBG2362-C8	63.40
.2362		6.000 mm	2.756	70.00 mm	(10x)	6 mm	125 mm	ERY2362-C8	64.70
.2362		6.000 mm	3.228	82.00 mm	(12x)	6 mm	125 mm	DQW2362-C8	66.00
.2380	B	6.045 mm	1.575	40.00 mm	(5x)	8 mm	100 mm	BAF2380-C8	64.20
.2380	B	6.045 mm	3.307	84.00 mm	(12x)	8 mm	125 mm	DQW2380-C8	68.20
.2420	C	6.146 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BAF2420-C8	64.20
.2420	C	6.146 mm	3.307	84.00 mm	(12x)	8 mm	125 mm	DQW2420-C8	68.20
.2460	D	6.248 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BAF2460-C8	64.20
.2460	D	6.248 mm	3.386	86.00 mm	(12x)	8 mm	150 mm	DQW2460-C8	68.20
.2500 (1/4)	E	6.350 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	AVA2500-C8	60.80
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BAF2500-C8	62.10
.2500 (1/4)	E	6.350 mm	2.441	62.00 mm	(8x)	8 mm	125 mm	CBG2500-C8	63.40
.2500 (1/4)	E	6.350 mm	2.913	74.00 mm	(10x)	8 mm	125 mm	ERY2500-C8	64.70
.2500 (1/4)	E	6.350 mm	3.465	88.00 mm	(12x)	8 mm	150 mm	DQW2500-C8	66.00
.2510		6.375 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BAF2510-C8	70.50
.2570	F	6.528 mm	1.732	44.00 mm	(5x)	8 mm	100 mm	BAF2570-C8	70.50
.2812 (9/32)		7.142 mm	1.890	48.00 mm	(5x)	8 mm	100 mm	BAF2812-C8	70.50
.3125 (5/16)		7.937 mm	2.126	54.00 mm	(5x)	8 mm	100 mm	BAF3125-C8	70.50
.3150		8.000 mm	2.126	54.00 mm	(5x)	8 mm	100 mm	BAF3150-C8	70.50
.3750 (3/8)		9.525 mm	1.811	46.00 mm	(3x)	10 mm	100 mm	AVA3750-C8	118.10
.3750 (3/8)		9.525 mm	2.520	64.00 mm	(5x)	10 mm	125 mm	BAF3750-C8	121.00
.3770	V	9.575 mm	1.811	46.00 mm	(3x)	10 mm	100 mm	AVA3770-C8	118.10
.3770	V	9.575 mm	2.520	64.00 mm	(5x)	10 mm	125 mm	BAF3770-C8	121.00
.3937		10.000 mm	2.677	68.00 mm	(5x)	10 mm	125 mm	BAF3937-C8	121.00
.4375 (7/16)		11.112 mm	2.992	76.00 mm	(5x)	12 mm	125 mm	BAF4375-C8	153.60
.4724		12.000 mm	3.228	82.00 mm	(5x)	12 mm	125 mm	BAF4724-C8	153.60
.5000 (1/2)		12.700 mm	3.386	86.00 mm	(5x)	16 mm	150 mm	BAF5000-C8	270.10

See Speeds & Feeds on next page

MINIATURE HIGH PERFORMANCE DRILLS

Aluminum Alloys (cont.)

SPEEDS & FEEDS (Miniature High Performance Drills – Aluminum Alloys)

Important Note: Values in table are in inches and are based on 3x and 5x drill lengths. For longer lengths, table values of IPR must be reduced (for 8x and 10x, reduce to 75%; for 12x, reduce to 65%). Pecking cycles are recommended to avoid chip packing and breakage. The initial peck depth should be 3-5x diameter with each subsequent peck at 2-3x diameter. For complete speeds and feeds charts, please go to www.harveytool.com.

Material (Hardness: ≤ 28 Rc)	SFM	Chip Load IPR (Inches Per Revolution) By Drill Diameter								
		.015	.031	.047	.062	.078	.093	.125	.187	.250
Aluminum Alloys: Casting (2xx, 5xx, 7xx, 8xx)	450	.00079	.00164	.00248	.00327	.00412	.00491	.00660	.00987	.01320
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	600									
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	450									
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	420									
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	390									
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	350									
Wrought - 5%-8% Si (4xxx)	600									
Wrought - 8%-12% Si (4xxx)	480									
Magnesium Alloys	900									
Zinc Alloys	480	.00079	.00164	.00248	.00327	.00412	.00491	.00660	.00987	.01320
Copper Alloys: High Coppers - 90%+ (C1xxx)	170									
Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)	375									
Phosphor Bronzes (Copper Tin alloys, C5xxxx)	170									
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	375									
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	375									
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	170									
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	400									
Plastics: Unfilled Plastics	500									
Reinforced Plastics	350	.00063	.00131	.00199	.00329	.00393	.00528	.00790	.01056	.01584

ALUMINUM ALLOYS

NEW

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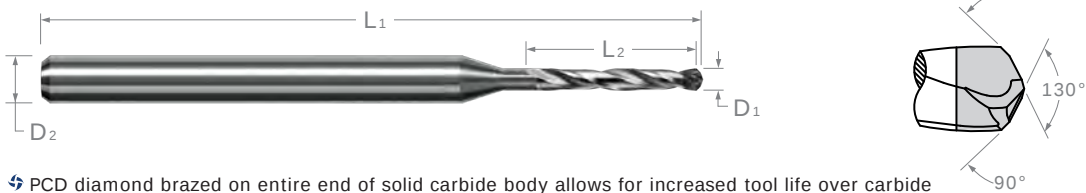


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MINIATURE HIGH PERFORMANCE DRILLS

PCD Diamond – Double Angle



- PCD diamond brazed on entire end of solid carbide body allows for increased tool life over carbide
- Full PCD tip allows for positive cutting geometry
- Double angle point geometry for superior performance in preventing push-out and delamination in layered composites
- Recommended work piece material: aluminum, copper, brass, bronze, plastic, graphite, carbon, carbon fiber materials, green carbide, gold, silver, magnesium, zinc, green ceramics
- h6 shank tolerance for high precision tool holders

DRILL DIAMETER		FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	PCD DIAMOND	
inch	metric	inch	metric	hole depth				
	$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0937 (3/32)	2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BCF0937	554.80
.1181	3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BCF1181	554.80

	$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.1250 (1/8)	3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BCF1250	510.30
.1299	3.300 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BCF1299	510.30
.1650	4.190 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BCF1650	564.10
.1875 (3/16)	4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BCF1875	564.10
.1910	#11 4.851 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BCF1910	564.10
.2500 (1/4)	E 6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BCF2500	649.50
.2510	6.375 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BCF2510	649.50

For PCD End Mills, see pages 223 and 224.

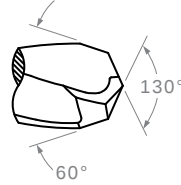
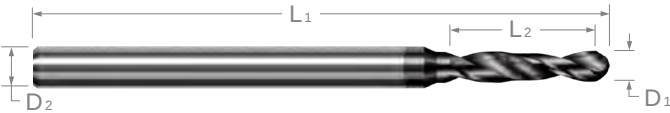
SPEEDS & FEEDS (Miniature High Performance Drills – PCD Diamond)

Important Note: Values in table are in inches and are based on 5x drill lengths. Since the melting point varies greatly from in plastics, the speed (RPM) used should be closely supervised. An additional reduction in RPM may be necessary to avoid excessive fraying, splitting and tear out of fibers. Pecking cycles are recommended to avoid chip packing and breakage. The initial peck depth should be 3-5x Diameter with each subsequent peck at 2-3x Diameter. For Metal Matrix Composites with aluminum, pecking should begin when part thickness is more than 1x Diameter and a feed reduction of 30%. For titanium, pecking should begin when part thickness is more than .5x Diameter and a feed reduction of 50% with a subsequent peck .5-1x Diameter. For complete speeds and feeds charts, please go to www.harveytool.com.

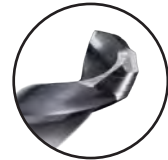
Material	Type	Hardness	SFM	Chip Load (IPR) By Drill Diameter				
				.078	.093	.125	.187	.250
Unfilled Plastics ETFE, FEP, HDPE, LDPE, PFA, Polyurethane, PTFE, Rulon, Teflon, UHMW	Unfilled	50 < 100 Rr, (55 < 85 Shore D)	800 - 1200	.0037	.0045	.0060	.0090	.0120
Acrylic, Acetal, Delrin, Lucite, Nylon 6, Nylon 6/6, PAI, PI, PEEK, Plexiglas, PS, PSU, Torlon 4203, Ultem 1000	Unfilled	100 > 150 Rr	500 - 800	.0041	.0049	.0066	.0099	.0132
Filled Plastics Vespel SP-3	Lubricant Filled (Oil, Moly, Graphite, Teflon, PTFE)	50 < 100 Rr, (55 < 85 Shore D)	800 - 1200	.0037	.0045	.0060	.0090	.0120
Nyol, Nylatron, Plavis MS, Torlon 4301	Lubricant Filled (Oil, Moly, Graphite, Teflon, PTFE)	100 > 150 Rr	500 - 800	.0041	.0049	.0066	.0099	.0132
	Carbon/Glass Filled 5% < 20%	100 > 150 Rr	400 - 600	.0041	.0049	.0066	.0099	.0132
	Carbon/Glass Filled 21% < 40%	100 > 150 Rr	350 - 500	.0034	.0040	.0054	.0081	.0108
Fiber Reinforced Plastics FR4, G10, G11	Carbon/Glass Fiber 5% < 20%	100 > 150 Rr	350 - 500	.0041	.0049	.0066	.0099	.0132
G30	Carbon/Glass Fiber 21% < 40%	100 > 150 Rr	200 - 300	.0034	.0040	.0054	.0081	.0108
Metal Matrix Composites	Aluminum/Composite Layered		320 - 500	.0041	.0049	.0066	.0099	.0132
	Titanium/Composite Layered		160 - 260	.0030	.0036	.0048	.0072	.0096
Graphite PCCO 3			400 - 600	.0043	.0051	.0069	.0103	.0138
Green Ceramic & Green Carbide			100 - 300	.0039	.0047	.0063	.0094	.0126

MINIATURE HIGH PERFORMANCE DRILLS

Composites – Double Angle



- Optimized for drilling layered composites with excellent performance in virgin plastics and other composite materials
- Double angle point geometry for superior performance in preventing push-out and delamination in layered composites
- Amorphous diamond coating for increased abrasion resistance
- h6 shank tolerance for high precision tool holders
- Solid carbide
- CNC ground in the USA 



Double Angle Point Geometry Prevents Delamination

COMPOSITES

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AMORPHOUS DIAMOND	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	DDA0312-C4	57.10
.0314		.800 mm	.213	5.40 mm	(5x)	3 mm	50 mm	DDA0315-C4	57.10
.0320	#67	.812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	DDA0320-C4	57.10
.0330	#66	.838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	DDA0330-C4	57.10
.0350	#65	.889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	DDA0350-C4	57.10
.0354		.900 mm	.236	6.00 mm	(5x)	3 mm	50 mm	DDA0354-C4	57.10
.0360	#64	.914 mm	.244	6.20 mm	(5x)	3 mm	50 mm	DDA0360-C4	57.10
.0370	#63	.939 mm	.252	6.40 mm	(5x)	3 mm	50 mm	DDA0370-C4	57.10
.0380	#62	.965 mm	.260	6.60 mm	(5x)	3 mm	50 mm	DDA0380-C4	57.10
.0390	#61	.990 mm	.260	6.60 mm	(5x)	3 mm	50 mm	DDA0390-C4	57.10
.0393		1.000 mm	.268	6.80 mm	(5x)	3 mm	50 mm	DDA0393-C4	58.50
.0400	#60	1.016 mm	.268	6.80 mm	(5x)	3 mm	50 mm	DDA0400-C4	58.50
.0410	#59	1.041 mm	.276	7.00 mm	(5x)	3 mm	50 mm	DDA0410-C4	58.50
.0420	#58	1.066 mm	.283	7.20 mm	(5x)	3 mm	50 mm	DDA0420-C4	58.50
.0430	#57	1.092 mm	.291	7.40 mm	(5x)	3 mm	50 mm	DDA0430-C4	58.50
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	DDA0450-C4	58.50
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	DDA0465-C4	58.50
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	DDA0468-C4	58.50
.0492		1.250 mm	.335	8.50 mm	(5x)	3 mm	50 mm	DDA0492-C4	58.50
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	DDA0500-C4	58.50
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	DDA0520-C4	58.50
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	DDA0550-C4	58.50
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	DDA0590-C4	59.40
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	DDA0595-C4	59.40
.0600		1.524 mm	.413	10.50 mm	(5x)	3 mm	50 mm	DDA0600-C4	59.40
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	DDA0625-C4	59.40
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	DDA0635-C4	59.40
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	DDA0670-C4	59.40

continued on next page

MINIATURE HIGH PERFORMANCE DRILLS

Composites – Double Angle (cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AMORPHOUS DIAMOND	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	DDA0700-C4	59.40
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	DDA0730-C4	59.40
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	DDA0760-C4	59.40
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	DDA0781-C4	59.40
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	DDA0785-C4	59.40
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	DDA0787-C4	60.40
.0800		2.032 mm	.531	13.50 mm	(5x)	4 mm	50 mm	DDA0800-C4	60.40
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	DDA0810-C4	60.40
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	DDA0820-C4	60.40
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	DDA0860-C4	60.40
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	DDA0890-C4	60.40
.0900		2.286 mm	.591	15.00 mm	(5x)	4 mm	50 mm	DDA0900-C4	60.40
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	DDA0935-C4	60.40
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	DDA0937-C4	60.40
.0937 (3/32)		2.381 mm	.906	23.00 mm	(8x)	4 mm	63 mm	AWS0937-C4	62.10
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	DDA0960-C4	60.40
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	DDA0980-C4	60.40
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	DDA0984-C4	60.90
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	DDA0995-C4	60.90
.1000		2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	DDA1000-C4	60.90
.1000		2.540 mm	.984	25.00 mm	(8x)	4 mm	63 mm	AWS1000-C4	62.10
.1015	#38	2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	DDA1015-C4	60.90
.1040	#37	2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	DDA1040-C4	60.90
.1065	#36	2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	DDA1065-C4	60.90
.1093 (7/64)		2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	DDA1093-C4	60.90
.1100	#35	2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	DDA1100-C4	60.90
.1110	#34	2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	DDA1110-C4	60.90
.1130	#33	2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	DDA1130-C4	60.90
.1160	#32	2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	DDA1160-C4	60.90
.1181		3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	DDA1181-C4	62.30
.1181		3.000 mm	1.142	29.00 mm	(8x)	4 mm	63 mm	AWS1181-C4	63.90

		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .75mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	DDA1200-C4	73.70
.1250 (1/8)		3.175 mm	.590	15.00 mm	(3x)	6 mm	63 mm	BAA1250-C4	72.40
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	DDA1250-C4	73.70
.1250 (1/8)		3.175 mm	1.220	31.00 mm	(8x)	6 mm	75 mm	AWS1250-C4	75.70
.1285	#30	3.263 mm	.866	22.00 mm	(5x)	6 mm	63 mm	DDA1285-C4	73.70
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	DDA1360-C4	73.70
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	DDA1406-C4	73.70
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	DDA1470-C4	73.70
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	DDA1562-C4	73.70
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	DDA1574-C4	73.70
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	DDA1590-C4	73.70

COMPOSITES

continued on next page

MINIATURE HIGH PERFORMANCE DRILLS

Composites – Double Angle (cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AMORPHOUS DIAMOND	
inch	wire	metric	inch	metric	hole depth				
		D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		L ₂ $\begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		D ₂ (h6)	L ₁	2 FL	PRICE
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	DDA1718-C4	73.70
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	DDA1770-C4	73.70
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	DDA1800-C4	73.70
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	DDA1875-C4	73.70
.1875 (3/16)		4.762 mm	1.811	46.00 mm	(8x)	6 mm	100 mm	AWS1875-C4	75.70
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	DDA1968-C4	73.70
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	DDA2009-C4	73.70
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	DDA2031-C4	73.70
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	DDA2129-C4	73.70
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	DDA2187-C4	73.70
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	DDA2343-C4	73.70
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	DDA2362-C4	73.70
.2500 (1/4)	E	6.350 mm	1.181	30.00 mm	(3x)	8 mm	75 mm	BAA2500-C4	72.40
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	DDA2500-C4	73.70
.2500 (1/4)	E	6.350 mm	2.441	62.00 mm	(8x)	8 mm	125 mm	AWS2500-C4	75.70

COMPOSITES

SPEEDS & FEEDS (Miniature High Performance Drills – Composites)

Important Note: Posted chiploads are for the double angle drills. For brad point drills, reduce chiploads by approx. 10%. Since the melting point varies greatly from plastic to plastic, the speed (RPM) used should be closely supervised. An additional reduction in RPM may be necessary to avoid excessive fraying, splitting and tear out of fibers. Pecking cycles are recommended to avoid chip packing and breakage. The initial peck depth should be 3-5x Diameter with each subsequent peck at 2-3x Diameter. Look at our online speeds and feeds for more information. For complete speeds and feeds charts, please go to www.harveytool.com.

Material Type		Type	Hardness	SFM	Chip Load Per Revolution (IPR) By Cutter Diameter									
						.015	.031	.047	.062	.078	.093	.125	.187	.250
Unfilled Plastics	ETFE, FEP, HDPE, LDPE, PFA, Polyurethane, PTFE, Rulon, Teflon, UHMW	Unfilled	50 < 100 Rr, 55 < 85 Shore D	800-1200		.0006	.0013	.0020	.0027	.0034	.0040	.0054	.0081	.0108
	Acrylic, Acetal, Delrin, Lucite, Nylon 6, Nylon 6/6, PAI, PI, PEEK, Plexiglas, PS, PSU, Torlon 4203, Ultem 1000	Unfilled	100 > 150 Rr	500-800		.0007	.0015	.0022	.0029	.0037	.0044	.0059	.0089	.0119
Filled Plastics	Vespeal SP-3	Lubricant Filled (Oil, Moly, Graphite, Teflon, PTFE)	50 < 100 Rr, 55 < 85 Shore D	800-1200		.0006	.0013	.0020	.0027	.0034	.0040	.0054	.0081	.0108
	Nyolil, Nylatron, Plavis MS, Torlon 4301	Lubricant Filled (Oil, Moly, Graphite, Teflon, PTFE)	100 > 150 Rr	500-800		.0007	.0015	.0022	.0029	.0037	.0044	.0059	.0089	.0119
		Carbon/Glass Filled 5% < 20%	100 > 150 Rr	400-600		.0007	.0015	.0022	.0029	.0037	.0044	.0059	.0089	.0119
		Carbon/Glass Filled 21% < 40%	100 > 150 Rr	350-500		.0006	.0012	.0018	.0024	.0030	.0036	.0049	.0073	.0097
Fiber Reinforced	FR4, G10, G11	Carbon/Glass Fiber 5% < 20%	100 > 150 Rr	350-500		.0007	.0015	.0022	.0029	.0037	.0044	.0059	.0089	.0119
	G30	Carbon/Glass Fiber 21% < 40%	100 > 150 Rr	200-300		.0006	.0012	.0018	.0024	.0030	.0036	.0049	.0073	.0097



Access **Simulation Files** in DXF format for every Harvey Tool product, downloadable from Harveytool.com

MINIATURE HIGH PERFORMANCE DRILLS

Composites – Brad Point



- Optimized for drilling glass or carbon fiber filled and reinforced composites with excellent performance in other filled, layered, and woven composite materials
- Center and OD spur point geometry for accurate scoring action, prevents fraying, uncut fibers, and tear out
- Amorphous diamond coating for increased abrasion resistance
- h6 shank tolerance for high precision tool holders
- Solid carbide
- CNC ground in the USA 



Brad Point Prevents Fraying & Tear Out

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AMORPHOUS DIAMOND	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} - .013mm		L ₂ ^{+ .25mm} - .00mm		D ₂ (h6)	L ₁	2 FL	PRICE
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BSW0312-C4	49.20
.0315		.800 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BSW0315-C4	49.20
.0320	#67	.812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	BSW0320-C4	49.20
.0330	#66	.838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	BSW0330-C4	49.20
.0350	#65	.889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BSW0350-C4	49.20
.0354		.900 mm	.236	6.00 mm	(5x)	3 mm	50 mm	BSW0354-C4	49.20
.0360	#64	.914 mm	.244	6.20 mm	(5x)	3 mm	50 mm	BSW0360-C4	49.20
.0370	#63	.939 mm	.252	6.40 mm	(5x)	3 mm	50 mm	BSW0370-C4	49.20
.0380	#62	.965 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BSW0380-C4	49.20
.0390	#61	.990 mm	.260	6.60 mm	(5x)	3 mm	50 mm	BSW0390-C4	49.20
.0393		1.000 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BSW0393-C4	51.50
.0400	#60	1.016 mm	.268	6.80 mm	(5x)	3 mm	50 mm	BSW0400-C4	51.50
.0410	#59	1.041 mm	.276	7.00 mm	(5x)	3 mm	50 mm	BSW0410-C4	51.50
.0420	#58	1.066 mm	.283	7.20 mm	(5x)	3 mm	50 mm	BSW0420-C4	51.50
.0430	#57	1.092 mm	.291	7.40 mm	(5x)	3 mm	50 mm	BSW0430-C4	51.50
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	BSW0450-C4	51.50
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BSW0465-C4	51.50
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	BSW0468-C4	51.50
.0492		1.250 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BSW0492-C4	51.50
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	BSW0500-C4	51.50
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	BSW0520-C4	51.50
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	BSW0550-C4	51.50
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BSW0590-C4	51.50
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	BSW0595-C4	51.50
.0600		1.524 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BSW0600-C4	51.50
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	BSW0625-C4	51.50
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	BSW0635-C4	51.50
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	BSW0670-C4	51.50
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	BSW0700-C4	51.50
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	BSW0730-C4	51.50
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	BSW0760-C4	51.50
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BSW0781-C4	51.50
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	BSW0785-C4	51.50
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BSW0787-C4	53.50

continued on next page

MINIATURE HIGH PERFORMANCE DRILLS

Composites – Brad Point (cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AMORPHOUS DIAMOND	
inch	wire	metric	inch	metric	hole depth				
		D ₁ ^{+ .000mm} _{– .013mm}		L ₂ ^{+ .25mm} _{– .00mm}		D ₂ (h6)	L ₁	2 FL	PRICE
.0800		2.032 mm	.531	13.50 mm	(5x)	4 mm	50 mm	BSW0800-C4	53.50
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BSW0810-C4	53.50
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	BSW0820-C4	53.50
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	BSW0860-C4	53.50
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BSW0890-C4	53.50
.0900		2.286 mm	.591	15.00 mm	(5x)	4 mm	50 mm	BSW0900-C4	53.50
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BSW0935-C4	54.20
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BSW0937-C4	54.20
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	BSW0960-C4	54.20
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BSW0980-C4	54.20
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BSW0984-C4	54.70
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BSW0995-C4	54.70
.1000		2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BSW1000-C4	54.70
.1015	#38	2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	BSW1015-C4	54.70
.1040	#37	2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BSW1040-C4	54.70
.1065	#36	2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	BSW1065-C4	54.70
.1093 (7/64)		2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BSW1093-C4	54.70
.1100	#35	2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BSW1100-C4	54.70
.1110	#34	2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BSW1110-C4	54.70
.1130	#33	2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	BSW1130-C4	54.70
.1160	#32	2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BSW1160-C4	54.70
.1181		3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	BSW1181-C4	54.70

		D ₁ ^{+ .000mm} _{– .013mm}		L ₂ ^{+ .75mm} _{– .00mm}		D ₂ (h6)	L ₁	2 FL	PRICE
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BSW1200-C4	63.10
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	BSW1250-C4	63.10
.1285	#30	3.263 mm	.866	22.00 mm	(5x)	6 mm	63 mm	BSW1285-C4	63.10
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	BSW1360-C4	63.10
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	BSW1406-C4	63.10
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BSW1470-C4	63.10
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	BSW1562-C4	63.10
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BSW1574-C4	63.10
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	BSW1590-C4	63.10
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BSW1718-C4	63.10
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BSW1770-C4	63.10
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	BSW1800-C4	63.10
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	BSW1875-C4	63.10
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BSW1968-C4	63.10
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BSW2009-C4	63.10
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	BSW2031-C4	63.10
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	BSW2129-C4	63.10
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	BSW2187-C4	63.10
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BSW2343-C4	63.10
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	BSW2362-C4	63.10
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	BSW2500-C4	63.10

PLEASE SEE SPEEDS & FEEDS ON PAGE 446

MINIATURE HIGH PERFORMANCE DRILLS

Flat Bottom



Ideal for Inclined & Rounded Surfaces

- Flat bottom design (no point angle and no dish) allows for drilling on irregular surfaces and reduces burrs on break through
- Ideal for drilling on inclined and rounded surfaces, creating flat bottom holes, tilted drilling for angled holes, and drilling intersecting holes, half holes, shoulders, or thin plates
- h6 shank tolerance for high precision tool holders
- Solid carbide
- CNC ground in the USA 



No Point Angle & No Dish
 Allows for Drilling on
 Irregular Surfaces

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	A1TIN COATED		TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth						
D ₁ ^{+ .000mm} _{-.013mm}			L ₂ ^{+ .25mm} _{-.00mm}			D ₂ (h6)	L ₁	2 FL	PRICE	2 FL	PRICE
.0312 (1/32)		.793 mm	.213	5.40 mm	(5x)	3 mm	50 mm	FBD0312-C3	46.00	FBD0312-C8	49.10
.0314		.800 mm	.213	5.40 mm	(5x)	3 mm	50 mm	FBD0315-C3	46.00	FBD0315-C8	49.10
.0320	#67	.812 mm	.213	5.40 mm	(5x)	3 mm	50 mm	FBD0320-C3	46.00	FBD0320-C8	49.10
.0330	#66	.838 mm	.220	5.60 mm	(5x)	3 mm	50 mm	FBD0330-C3	46.00	FBD0330-C8	49.10
.0350	#65	.889 mm	.236	6.00 mm	(5x)	3 mm	50 mm	FBD0350-C3	46.00	FBD0350-C8	49.10
.0354		.900 mm	.236	6.00 mm	(5x)	3 mm	50 mm	FBD0354-C3	46.00	FBD0354-C8	49.10
.0360	#64	.914 mm	.244	6.20 mm	(5x)	3 mm	50 mm	FBD0360-C3	46.00	FBD0360-C8	49.10
.0370	#63	.939 mm	.252	6.40 mm	(5x)	3 mm	50 mm	FBD0370-C3	46.00	FBD0370-C8	49.10
.0380	#62	.965 mm	.260	6.60 mm	(5x)	3 mm	50 mm	FBD0380-C3	46.00	FBD0380-C8	49.10
.0390	#61	.990 mm	.260	6.60 mm	(5x)	3 mm	50 mm	FBD0390-C3	46.00	FBD0390-C8	49.10
.0393		1.000 mm	.268	6.80 mm	(5x)	3 mm	50 mm	FBD0393-C3	50.40	FBD0393-C8	53.60
.0400	#60	1.016 mm	.268	6.80 mm	(5x)	3 mm	50 mm	FBD0400-C3	50.40	FBD0400-C8	53.60
.0410	#59	1.041 mm	.276	7.00 mm	(5x)	3 mm	50 mm	FBD0410-C3	50.40	FBD0410-C8	53.60
.0420	#58	1.066 mm	.283	7.20 mm	(5x)	3 mm	50 mm	FBD0420-C3	50.40	FBD0420-C8	53.60
.0430	#57	1.092 mm	.291	7.40 mm	(5x)	3 mm	50 mm	FBD0430-C3	50.40	FBD0430-C8	53.60
.0450		1.143 mm	.307	7.80 mm	(5x)	3 mm	50 mm	FBD0450-C3	50.40	FBD0450-C8	53.60
.0465	#56	1.181 mm	.315	8.00 mm	(5x)	3 mm	50 mm	FBD0465-C3	50.40	FBD0465-C8	53.60
.0468 (3/64)		1.190 mm	.315	8.00 mm	(5x)	3 mm	50 mm	FBD0468-C3	50.40	FBD0468-C8	53.60
.0492		1.250 mm	.335	8.50 mm	(5x)	3 mm	50 mm	FBD0492-C3	50.40	FBD0492-C8	53.60
.0500		1.270 mm	.335	8.50 mm	(5x)	3 mm	50 mm	FBD0500-C3	50.40	FBD0500-C8	53.60
.0520	#55	1.320 mm	.354	9.00 mm	(5x)	3 mm	50 mm	FBD0520-C3	50.40	FBD0520-C8	53.60
.0550	#54	1.397 mm	.374	9.50 mm	(5x)	3 mm	50 mm	FBD0550-C3	50.40	FBD0550-C8	53.60
.0590		1.500 mm	.394	10.00 mm	(5x)	3 mm	50 mm	FBD0590-C3	54.20	FBD0590-C8	57.40
.0595	#53	1.511 mm	.394	10.00 mm	(5x)	3 mm	50 mm	FBD0595-C3	54.20	FBD0595-C8	57.40
.0600		1.524 mm	.413	10.50 mm	(5x)	3 mm	50 mm	FBD0600-C3	54.20	FBD0600-C8	57.40
.0625 (1/16)		1.587 mm	.299	7.60 mm	(3x)	3 mm	50 mm	FBF0625-C3	53.00	FBF0625-C8	56.10
.0625 (1/16)		1.587 mm	.413	10.50 mm	(5x)	3 mm	50 mm	FBD0625-C3	54.20	FBD0625-C8	57.40
.0635	#52	1.612 mm	.433	11.00 mm	(5x)	3 mm	50 mm	FBD0635-C3	54.20	FBD0635-C8	57.40
.0670	#51	1.701 mm	.453	11.50 mm	(5x)	3 mm	50 mm	FBD0670-C3	54.20	FBD0670-C8	57.40
.0700	#50	1.778 mm	.334	8.50 mm	(3x)	3 mm	50 mm	FBF0700-C3	53.00	FBF0700-C8	56.10
.0700	#50	1.778 mm	.472	12.00 mm	(5x)	3 mm	50 mm	FBD0700-C3	54.20	FBD0700-C8	57.40

continued on next page

FLAT BOTTOM

MINIATURE HIGH PERFORMANCE DRILLS

Flat Bottom (cont.)

continued from previous page

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AITIN COATED		TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth						
D ₁ ^{+ .000mm} _{-.013mm}			L ₂ ^{+ .25mm} _{-.00mm}			D ₂ (h6)	L ₁	2 FL	PRICE	2 FL	PRICE
.0730	#49	1.854 mm	.492	12.50 mm	(5x)	3 mm	50 mm	FBD0730-C3	54.20	FBD0730-C8	57.40
.0760	#48	1.930 mm	.512	13.00 mm	(5x)	3 mm	50 mm	FBD0760-C3	54.20	FBD0760-C8	57.40
.0781 (5/64)		1.984 mm	.531	13.50 mm	(5x)	3 mm	50 mm	FBD0781-C3	54.20	FBD0781-C8	57.40
.0785	#47	1.993 mm	.531	13.50 mm	(5x)	3 mm	50 mm	FBD0785-C3	54.20	FBD0785-C8	57.40
.0787		2.000 mm	.531	13.50 mm	(5x)	4 mm	50 mm	FBD0787-C3	58.50	FBD0787-C8	61.60
.0800		2.032 mm	.531	13.50 mm	(5x)	4 mm	50 mm	FBD0800-C3	58.50	FBD0800-C8	61.60
.0810	#46	2.057 mm	.551	14.00 mm	(5x)	4 mm	50 mm	FBD0810-C3	58.50	FBD0810-C8	61.60
.0820	#45	2.082 mm	.551	14.00 mm	(5x)	4 mm	50 mm	FBD0820-C3	58.50	FBD0820-C8	61.60
.0860	#44	2.184 mm	.571	14.50 mm	(5x)	4 mm	50 mm	FBD0860-C3	58.50	FBD0860-C8	61.60
.0890	#43	2.260 mm	.591	15.00 mm	(5x)	4 mm	50 mm	FBD0890-C3	58.50	FBD0890-C8	61.60
.0900		2.286 mm	.591	15.00 mm	(5x)	4 mm	50 mm	FBD0900-C3	58.50	FBD0900-C8	61.60
.0935	#42	2.374 mm	.630	16.00 mm	(5x)	4 mm	63 mm	FBD0935-C3	58.50	FBD0935-C8	61.60
.0937 (3/32)		2.381 mm	.630	16.00 mm	(5x)	4 mm	63 mm	FBD0937-C3	58.50	FBD0937-C8	61.60
.0960	#41	2.438 mm	.630	16.00 mm	(5x)	4 mm	63 mm	FBD0960-C3	58.50	FBD0960-C8	61.60
.0980	#40	2.489 mm	.669	17.00 mm	(5x)	4 mm	63 mm	FBD0980-C3	58.50	FBD0980-C8	61.60
.0984		2.500 mm	.669	17.00 mm	(5x)	4 mm	63 mm	FBD0984-C3	62.00	FBD0984-C8	65.20
.0995	#39	2.527 mm	.669	17.00 mm	(5x)	4 mm	63 mm	FBD0995-C3	62.00	FBD0995-C8	65.20
.1000		2.540 mm	.669	17.00 mm	(5x)	4 mm	63 mm	FBD1000-C3	62.00	FBD1000-C8	65.20
.1015	#38	2.578 mm	.669	17.00 mm	(5x)	4 mm	63 mm	FBD1015-C3	62.00	FBD1015-C8	65.20
.1040	#37	2.641 mm	.709	18.00 mm	(5x)	4 mm	63 mm	FBD1040-C3	62.00	FBD1040-C8	65.20
.1065	#36	2.705 mm	.709	18.00 mm	(5x)	4 mm	63 mm	FBD1065-C3	62.00	FBD1065-C8	65.20
.1093 (7/64)		2.778 mm	.748	19.00 mm	(5x)	4 mm	63 mm	FBD1093-C3	62.00	FBD1093-C8	65.20
.1100	#35	2.794 mm	.748	19.00 mm	(5x)	4 mm	63 mm	FBD1100-C3	62.00	FBD1100-C8	65.20
.1110	#34	2.819 mm	.748	19.00 mm	(5x)	4 mm	63 mm	FBD1110-C3	62.00	FBD1110-C8	65.20
.1130	#33	2.870 mm	.748	19.00 mm	(5x)	4 mm	63 mm	FBD1130-C3	62.00	FBD1130-C8	65.20
.1160	#32	2.946 mm	.787	20.00 mm	(5x)	4 mm	63 mm	FBD1160-C3	62.00	FBD1160-C8	65.20
.1181		3.000 mm	.787	20.00 mm	(5x)	4 mm	63 mm	FBD1181-C3	62.00	FBD1181-C8	65.20
D ₁ ^{+ .000mm} _{-.013mm}			L ₂ ^{+ .75mm} _{-.00mm}			D ₂ (h6)	L ₁	2 FL	PRICE	2 FL	PRICE
.1200	#31	3.048 mm	.570	14.50 mm	(3x)	6 mm	63 mm	FBF1200-C3	68.20	FBF1200-C8	71.30
.1200	#31	3.048 mm	.827	21.00 mm	(5x)	6 mm	63 mm	FBD1200-C3	69.50	FBD1200-C8	72.60
.1250 (1/8)		3.175 mm	.590	15.00 mm	(3x)	6 mm	63 mm	FBF1250-C3	68.20	FBF1250-C8	71.30
.1250 (1/8)		3.175 mm	.827	21.00 mm	(5x)	6 mm	63 mm	FBD1250-C3	69.50	FBD1250-C8	72.60
.1360	#29	3.454 mm	.629	16.00 mm	(3x)	6 mm	63 mm	FBF1360-C3	68.20	FBF1360-C8	71.30
.1360	#29	3.454 mm	.906	23.00 mm	(5x)	6 mm	63 mm	FBD1360-C3	69.50	FBD1360-C8	72.60
.1406 (9/64)		3.571 mm	.945	24.00 mm	(5x)	6 mm	75 mm	FBD1406-C3	69.50	FBD1406-C8	72.60
.1470	#26	3.733 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	FBD1470-C3	69.50	FBD1470-C8	72.60
.1562 (5/32)		3.968 mm	1.024	26.00 mm	(5x)	6 mm	75 mm	FBD1562-C3	69.50	FBD1562-C8	72.60
.1574		4.000 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	FBD1574-C3	69.50	FBD1574-C8	72.60
.1590	#21	4.038 mm	.748	19.00 mm	(3x)	6 mm	75 mm	FBF1590-C3	68.20	FBF1590-C8	71.30
.1590	#21	4.038 mm	1.102	28.00 mm	(5x)	6 mm	75 mm	FBD1590-C3	69.50	FBD1590-C8	72.60
.1718 (11/64)		4.365 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	FBD1718-C3	69.50	FBD1718-C8	72.60
.1770	#16	4.495 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	FBD1770-C3	69.50	FBD1770-C8	72.60
.1800	#15	4.572 mm	1.181	30.00 mm	(5x)	6 mm	75 mm	FBD1800-C3	69.50	FBD1800-C8	72.60
.1875 (3/16)		4.762 mm	1.260	32.00 mm	(5x)	6 mm	75 mm	FBD1875-C3	69.50	FBD1875-C8	72.60
.1968		5.000 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	FBD1968-C3	69.50	FBD1968-C8	72.60
.2009	#7	5.105 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	FBD2009-C3	69.50	FBD2009-C8	72.60

continued on next page

FLAT BOTTOM

MINIATURE HIGH PERFORMANCE DRILLS

Flat Bottom (cont.)

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DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	TiN COATED		TiB ₂ COATED	
inch	wire	metric	inch	metric	hole depth						
		D ₁ $\begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		L ₂ $\begin{smallmatrix} +.75\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		D ₂ (h6)	L ₁	2 FL	PRICE	2 FL	PRICE
.2031 (13/64)		5.159 mm	1.339	34.00 mm	(5x)	6 mm	75 mm	FBD2031-C3	69.50	FBD2031-C8	72.60
.2129	#3	5.410 mm	1.417	36.00 mm	(5x)	6 mm	75 mm	FBD2129-C3	69.50	FBD2129-C8	72.60
.2187 (7/32)		5.556 mm	1.496	38.00 mm	(5x)	6 mm	100 mm	FBD2187-C3	69.50	FBD2187-C8	72.60
.2343 (15/64)		5.953 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	FBD2343-C3	69.50	FBD2343-C8	72.60
.2362		6.000 mm	1.575	40.00 mm	(5x)	6 mm	100 mm	FBD2362-C3	69.50	FBD2362-C8	72.60
.2500 (1/4)	E	6.350 mm	1.181	30.00 mm	(3x)	8 mm	100 mm	FBF2500-C3	68.20	FBF2500-C8	71.30
.2500 (1/4)	E	6.350 mm	1.654	42.00 mm	(5x)	8 mm	100 mm	FBD2500-C3	69.50	FBD2500-C8	72.60

SPEEDS & FEEDS (Miniature High Performance Drills – Flat Bottom)

Important Note: Values in table are for a fully enclosed tool that is 1x diameter into the workpiece. A starting hole is required on a flat surface. For drilling on inclined or rounded surfaces please refer to the complete speeds and feeds chart available online at www.harveytool.com. Values in table are also based on a material hardness of 29-37 Rc for Ferrous Materials and up to 28 Rc for Non-Ferrous Materials. For higher hardness materials, table values of IPR must be reduced. For Ferrous materials at 38-45 Rc reduce IPR to 80% of the chart value. Pecking cycles are recommended to avoid chip packing and breakage. Initial Peck must fully submerge the drill point into the material. Do not use a pecking cycle for half-hole drilling or any situation where the drill is not fully enclosed in the material during the drilling operation. For steels at 29-37 Rc, an initial peck should be 2-3x Diameter, and each subsequent peck should be 1-2x Diameter. For harder steels at 38-45 Rc, 1-2x Diameter is recommended for an initial peck, and each subsequent peck should be .5-1x Diameter. For Non-Ferrous Materials, an initial peck should be 3-5x Diameter, and each subsequent peck should be 2-3x Diameter.

Coating	Material	SFM	Chip Load IPR (Inches Per Revolution) By Drill Diameter								
			.015	.031	.047	.062	.078	.093	.125	.187	.250
TiN Hardness: 29-37 Rc (279-344 HBn)	Carbon Steels Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	240	.00063	.00130	.00197	.00260	.00328	.00391	.00525	.00785	.01050
	1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx & 52Lxxx, 6xxx, 8xxx, 9xxx	150	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
	Stainless Steels 203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	180	.00063	.00130	.00197	.00260	.00328	.00391	.00525	.00785	.01050
	201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502	150	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
	414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	125	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
	Tool Steels A, L, O, P, W series	125	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
	D, H, M, T, S series	90	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
	Titanium Alloys	100	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
	High Temp Alloys Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	.00036	.00074	.00113	.00149	.00187	.00223	.00300	.00449	.00600
	Aluminum Alloys: Casting (2xx, 5xx, 7xx, 8xx) Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	450 600	.00072	.00149	.00226	.00298	.00374	.00446	.00600	.00898	.01200
TiB ₂ Hardness: ≤ 28 Rc (≤ 271 HBn)	Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	450									
	Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	420									
	Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	390									
	Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	350									
	Wrought - 5%-8% Si (4xxx)	600									
	Wrought - 8%-12% Si (4xxx)	480									
	Magnesium Alloys	900									
	Zinc Alloys	480	.00072	.00149	.00226	.00298	.00374	.00446	.00600	.00898	.01200
	Copper Alloys: High Coppers - 90%+ (C1xxx)	170									
	Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)	375									
	Phosphor Bronzes (Copper Tin alloys, C5xxxx)	170									
	Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	375	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960
	Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	375									
	Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)	170									
	Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	400									
	Plastics: Unfilled Plastics	500	.00072	.00149	.00226	.00298	.00374	.00446	.00600	.00898	.01200
	Reinforced Plastics	350	.00058	.00119	.00180	.00238	.00300	.00357	.00480	.00718	.00960

FLAT BOTTOM

MINIATURE HIGH PERFORMANCE DRILLS

Deep Hole – Coolant-Through



Available in
12x & 20x Flute
Lengths!

- Drill up to 20x diameter in depth
- Coolant through design for improved chip removal and heat reduction at the drill tip
- 140° point angle
- Specialized flute shape for improved chip evacuation and maximum rigidity
- h6 shank tolerance for high precision tool holders
- AlTiN coated for improved lubricity and heat resistance
- CNC ground in Germany
- Solid carbide



Coolant Through Design for
Improved Chip Removal

COOLANT-THROUGH

DRILL DIAMETER			FLUTE LENGTH			SHANK DIAMETER	OVERALL LENGTH	AlTiN COATED	
inch	wire	metric	inch	metric	hole depth				
		$D_1 \begin{smallmatrix} +.000\text{mm} \\ -.013\text{mm} \end{smallmatrix}$		$L_2 \begin{smallmatrix} +.25\text{mm} \\ -.00\text{mm} \end{smallmatrix}$		$D_2 \text{ (h6)}$	L_1	2 FL	PRICE
.0520	#55	1.320 mm	.709	18.00 mm	(12x)	3 mm	63 mm	ACD0520-C3	166.50
.0550	#54	1.397 mm	.748	19.00 mm	(12x)	3 mm	63 mm	ACD0550-C3	166.50
.0590		1.500 mm	.827	21.00 mm	(12x)	3 mm	63 mm	ACD0590-C3	166.50
.0590		1.500 mm	1.280	32.50 mm	(20x)	3 mm	75 mm	CXZ0590-C3	197.70
.0595	#53	1.511 mm	.827	21.00 mm	(12x)	3 mm	63 mm	ACD0595-C3	166.50
.0625 (1/16)		1.587 mm	.866	22.00 mm	(12x)	3 mm	63 mm	ACD0625-C3	166.50
.0625 (1/16)		1.587 mm	1.358	34.50 mm	(20x)	3 mm	75 mm	CXZ0625-C3	197.70
.0700	#50	1.778 mm	.945	24.00 mm	(12x)	3 mm	63 mm	ACD0700-C3	166.50
.0781 (5/64)		1.984 mm	1.063	27.00 mm	(12x)	3 mm	63 mm	ACD0781-C3	166.50
.0781 (5/64)		1.984 mm	1.693	43.00 mm	(20x)	3 mm	100 mm	CXZ0781-C3	197.70
.0787		2.000 mm	1.102	28.00 mm	(12x)	4 mm	63 mm	ACD0787-C3	172.40
.0787		2.000 mm	1.732	44.00 mm	(20x)	4 mm	100 mm	CXZ0787-C3	219.20
.0890	#43	2.260 mm	1.220	31.00 mm	(12x)	4 mm	75 mm	ACD0890-C3	172.40
.0937 (3/32)		2.381 mm	1.299	33.00 mm	(12x)	4 mm	75 mm	ACD0937-C3	172.40
.0937 (3/32)		2.381 mm	2.047	52.00 mm	(20x)	4 mm	100 mm	CXZ0937-C3	219.20
.1015	#38	2.578 mm	1.378	35.00 mm	(12x)	4 mm	75 mm	ACD1015-C3	172.40
.1065	#36	2.705 mm	1.457	37.00 mm	(12x)	4 mm	75 mm	ACD1065-C3	172.40
.1093 (7/64)		2.778 mm	1.496	38.00 mm	(12x)	4 mm	75 mm	ACD1093-C3	172.40
.1093 (7/64)		2.778 mm	2.362	60.00 mm	(20x)	4 mm	100 mm	CXZ1093-C3	219.20
.1181		3.000 mm	1.654	42.00 mm	(12x)	4 mm	100 mm	ACD1181-C3	172.40
.1181		3.000 mm	2.559	65.00 mm	(20x)	4 mm	100 mm	CXZ1181-C3	219.20

See Speeds & Feeds on next page

MINIATURE HIGH PERFORMANCE DRILLS

Deep Hole – Coolant-Through (cont.)

SPEEDS & FEEDS (Miniature High Performance Drills – Deep Hole)

Important Note: Values in table are in inches and are based on 12x length drills and a material hardness of 29-37 Rc. For longer lengths and higher hardness materials, table values of IPR must be reduced (for 20x, reduce to 75%). For ferrous materials at 38-45 Rc, reduce IPR to 80%. For complete speeds and feeds charts, please see www.harveytool.com.

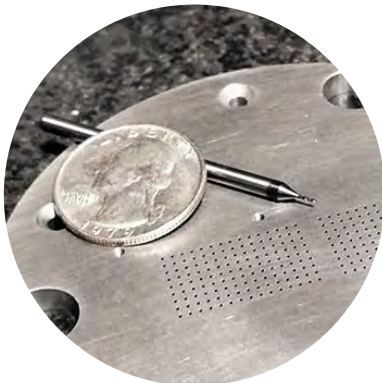
Material (Hardness: 29-37 Rc)	SFM	Chip Load IPR (Inches Per Revolution) By Drill Diameter							
		.031	.047	.062	.078	.093	.125	.187	.250
Carbon Steels Free Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	240	.00110	.00167	.00220	.00277	.00330	.00444	.00664	.00887
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	150	.00101	.00153	.00201	.00253	.00302	.00406	.00607	.00811
Stainless Steels 203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	180	.00110	.00167	.00220	.00277	.00330	.00444	.00664	.00887
201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502	150	.00101	.00153	.00201	.00253	.00302	.00406	.00607	.00811
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	125	.00063	.00095	.00126	.00158	.00189	.00254	.00379	.00507
Tool Steels A, L, O, P, W series	125	.00101	.00153	.00201	.00253	.00302	.00406	.00607	.00811
D, H, M, T, S series	90	.00063	.00095	.00126	.00158	.00189	.00254	.00379	.00507
Titanium Alloys	100	.00063	.00095	.00126	.00158	.00189	.00254	.00379	.00507
High Temp Alloys Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	.00063	.00095	.00126	.00158	.00189	.00254	.00379	.00507

Deep Hole Drilling Guidelines

For best results, the following steps are recommended:

- For hole depths of 12x Diameter or greater, drill a pilot hole up to 1.5x D in depth using a drill with 3x LOF or shorter.
- Insert primary drill at low speed (~500 rpm) and start coolant flow.
- Increase speed and feed to recommended parameters.
- Under optimal conditions, it is possible to feed to full hole depth without pecking. If necessary, use 2-4 pecks to get to full hole depth.
- After reaching desired hole depth, reduce speed (~500 RPM) before retracting the drill.
- Cutting oil is recommended. As an alternative, it is possible to use emulsions with EP additives. Use a fine mesh prefilter (=5µm) on spindle through coolant to prevent a blockage of the coolant hole. A minimum coolant pressure of 600-800 PSI is recommended.

COOLANT-THROUGH

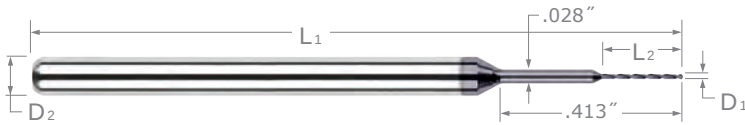


Selecting the Right Harvey Tool Miniature Drill

With so many different types of miniature drills to choose from, it can be tough to identify the right solution for your specific job. Learn how to choose right the first time in our "In the Loupe" blog post **Selecting the Right Miniature Drill**.

[Read more on harveyperformance.com / in-the-loupe /](http://www.harveyperformance.com/in-the-loupe/)

MINIATURE DRILLS



**Miniature
Drills Down
to .002"**

- For tools .020" and smaller, there is an intermediate neck diameter as pictured above
- 130° drill point
- Carbide
- CNC ground in Germany

MINIATURE DRILLS

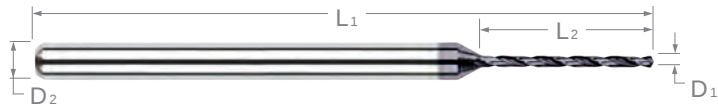
DRILL DIAMETER			FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AlTiN COATED		AMORPHOUS DIAMOND	
inch	wire	metric									
$D_1 \begin{smallmatrix} +.0000" \\ -.0003" \end{smallmatrix} *$			L_2	D_2	L_1	2 FL	PRICE	2 FL	PRICE	2 FL	PRICE
.0020		.050 mm	.014	1/8	1-1/2	810020**	37.80				
.0020		.050 mm	.028	1/8	1-1/2	20020	37.80				
.0039	#102	.100 mm	.026	1/8	1-1/2	810039**	26.90				
.0039	#102	.100 mm	.039	1/8	1-1/2	20039	26.90				
.0051	#99	.130 mm	.034	1/8	1-1/2	810051**	26.20				
.0051	#99	.130 mm	.056	1/8	1-1/2	20051	26.20				
.0059	#97	.150 mm	.040	1/8	1-1/2	810059**	24.40				
.0059	#97	.150 mm	.066	1/8	1-1/2	20059	24.40				
.0063	#96		.042	1/8	1-1/2	810063	24.40				
.0063	#96		.066	1/8	1-1/2	20063	24.40				
.0067	#95		.066	1/8	1-1/2	20067	24.40				
.0069		.175 mm	.066	1/8	1-1/2	20069	24.40				
.0071	#94		.106	1/8	1-1/2	20071	22.20				
.0075	#93		.106	1/8	1-1/2	20075	22.20				
.0079	#92	.200 mm	.054	1/8	1-1/2	810079**	18.60	810079-C3**	23.50		
.0079	#92	.200 mm	.160	1/8	1-1/2	20079	18.60	20079-C3	23.50		
.0083	#91		.160	1/8	1-1/2	20083	18.60	20083-C3	23.50		
.0087	#90		.126	1/8	1-1/2	20087	18.60	20087-C3	23.50		
.0089		.225 mm	.160	1/8	1-1/2	20089	18.60	20089-C3	23.50		
.0091	#89		.160	1/8	1-1/2	20091	18.20	20091-C3	23.10		
.0095	#88		.064	1/8	1-1/2	810095**	18.20	810095-C3**	23.10		
.0095	#88		.160	1/8	1-1/2	20095	18.20	20095-C3	23.10		
.0098		.250 mm	.066	1/8	1-1/2	810098**	18.20	810098-C3**	23.10		
.0098		.250 mm	.160	1/8	1-1/2	20098	18.20	20098-C3	23.10		
.0100	#87		.068	1/8	1-1/2	810100**	18.20	810100-C3**	23.10		
.0100	#87		.160	1/8	1-1/2	20100	18.20	20100-C3	23.10	20100-C4	30.60
.0105	#86		.160	1/8	1-1/2	20105	18.20	20105-C3	23.10		
.0108		.275 mm	.160	1/8	1-1/2	20108	18.20	20108-C3	23.10		
.0110	#85		.160	1/8	1-1/2	20110	18.20	20110-C3	23.10		
.0115	#84		.180	1/8	1-1/2	20115	18.20	20115-C3	23.10		
.0118		.300 mm	.180	1/8	1-1/2	20118	18.20	20118-C3	23.10		

* Tolerance for all AlTiN coating is $+.0002"/-.0003"$. ** Total overhang from shank transition is .250"

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MINIATURE DRILLS

(cont.)



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DRILL DIAMETER			FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AITIN COATED		AMORPHOUS DIAMOND	
inch	wire	metric									
D ₁ ^{+ .0000"} _{- .0003"} *			L ₂	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE	2 FL	PRICE
.0120	#83		.080	1/8	1-1/2	810120**	16.40	810120-C3**	21.30		
.0120	#83		.230	1/8	1-1/2	20120	16.40	20120-C3	21.30		
.0125	#82		.230	1/8	1-1/2	20125	16.40	20125-C3	21.30		
.0130	#81		.230	1/8	1-1/2	20130	16.40	20130-C3	21.30		
.0135	#80		.270	1/8	1-1/2	20135	16.00	20135-C3	20.90		
.0138		.350 mm	.270	1/8	1-1/2	20138	16.00	20138-C3	20.90		
.0145	#79		.100	1/8	1-1/2	810145**	16.00	810145-C3**	20.90		
.0145	#79		.270	1/8	1-1/2	20145	16.00	20145-C3	20.90	20145-C4	28.40
.0157		.400 mm	.105	1/8	1-1/2	810157**	16.00	810157-C3**	20.90		
.0157		.400 mm	.270	1/8	1-1/2	20157	16.00	20157-C3	20.90		
.0160	#78		.270	1/8	1-1/2	20160	16.00	20160-C3	20.90		
.0168			.270	1/8	1-1/2	20168	16.00	20168-C3	20.90		
.0177		.450 mm	.270	1/8	1-1/2	20177	16.00	20177-C3	20.90		
.0180	#77		.120	1/8	1-1/2	810180**	14.90	810180-C3**	19.80		
.0180	#77		.270	1/8	1-1/2	20180	14.90	20180-C3	19.80		
.0197		.500 mm	.275	1/8	1-1/2	20197	14.90	20197-C3	19.80		
.0200	#76		.135	1/8	1-1/2	810200**	14.90	810200-C3**	19.80		
.0200	#76		.275	1/8	1-1/2	20200	14.90	20200-C3	19.80	20200-C4	27.30
.0210	#75		.275	1/8	1-1/2	20205	14.90	20205-C3	19.80		
.0225	#74		.150	1/8	1-1/2	810210	14.90	810210-C3	19.80		
.0225	#74		.275	1/8	1-1/2	20210	14.90	20210-C3	19.80		
.0236		.600 mm	.275	1/8	1-1/2	20214	14.90	20214-C3	19.80		
.0240	#73		.275	1/8	1-1/2	20215	14.90	20215-C3	19.80		
.0250	#72		.170	1/8	1-1/2	810220	14.90	810220-C3	19.80		
.0250	#72		.275	1/8	1-1/2	20220	14.90	20220-C3	19.80		
.0260	#71		.275	1/8	1-1/2	20225	14.90	20225-C3	19.80		
.0276		.700 mm	.335	1/8	1-1/2	20229	14.90	20229-C3	19.80		
.0280	#70		.335	1/8	1-1/2	20230	14.90	20230-C3	19.80		
.0292	#69		.335	1/8	1-1/2	20235	14.90	20235-C3	19.80		
.0302			.395	1/8	1-1/2	20240	14.90	20240-C3	19.80		
.0310	#68		.210	1/8	1-1/2	810245	13.90	810245-C3	18.80		
.0310	#68		.395	1/8	1-1/2	20245	13.90	20245-C3	18.80		
.0312 (1/32)			.210	1/8	1-1/2	810250	13.90	810250-C3	18.80		
.0312 (1/32)			.395	1/8	1-1/2	20250	13.90	20250-C3	18.80	20250-C4	26.30
.0315		.800 mm	.395	1/8	1-1/2	20253	13.90	20253-C3	18.80		
.0320	#67		.395	1/8	1-1/2	20255	13.90	20255-C3	18.80		

* Tolerance for all AITIN coating is +.0002"/-.0003". ** Total overhang from shank transition is .250"

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MINIATURE DRILLS

MINIATURE DRILLS

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DRILL DIAMETER			FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		A1TiN COATED		AMORPHOUS DIAMOND	
inch	wire	metric									
D ₁ ^{+0.0000"} / _{-0.0003"} *			L ₂	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE	2 FL	PRICE
.0330	#66		.395	1/8	1-1/2	20260	13.90	20260-C3	18.80		
.0350	#65		.395	1/8	1-1/2	20265	13.90	20265-C3	18.80		
.0354		.900 mm	.395	1/8	1-1/2	20267	13.90	20267-C3	18.80		
.0360	#64		.395	1/8	1-1/2	20270	13.90	20270-C3	18.80		
.0370	#63		.395	1/8	1-1/2	20275	13.90	20275-C3	18.80		
.0380	#62		.395	1/8	1-1/2	20280	13.90	20280-C3	18.80		
.0390	#61		.395	1/8	1-1/2	20285	13.90	20285-C3	18.80		
.0394		1.000 mm	.395	1/8	1-1/2	20290	13.90	20290-C3	18.80		
.0400	#60		.395	1/8	1-1/2	20295	13.90	20295-C3	18.80		
.0410	#59		.395	1/8	1-1/2	20300	13.90	20300-C3	18.80		
.0420	#58		.395	1/8	1-1/2	20305	13.90	20305-C3	18.80		
.0430	#57		.395	1/8	1-1/2	20310	13.90	20310-C3	18.80		
.0433		1.100 mm	.395	1/8	1-1/2	20311	13.90	20311-C3	18.80		
.0440			.395	1/8	1-1/2	20315	13.90	20315-C3	18.80		
.0465	#56		.395	1/8	1-1/2	20320	13.90	20320-C3	18.80		
.0469 (3/64)			.395	1/8	1-1/2	20325	13.90	20325-C3	18.80		
.0472		1.200 mm	.395	1/8	1-1/2	20327	13.90	20327-C3	18.80		
.0492		1.250 mm	.395	1/8	1-1/2	20330	13.90	20330-C3	18.80		
.0500		1.270 mm	.395	1/8	1-1/2	20332	13.90	20332-C3	18.80		
.0512		1.300 mm	.413	1/8	1-1/2	20335	13.90	20335-C3	18.80		
.0520	#55		.413	1/8	1-1/2	20340	13.90	20340-C3	18.80		
.0520	#55		.500	1/8	1-1/2	815340	13.90	815340-C3	18.80		
.0531		1.350 mm	.413	1/8	1-1/2	20345	13.90	20345-C3	18.80		
.0550	#54		.413	1/8	1-1/2	20350	13.90	20350-C3	18.80	20350-C4	26.30
.0550	#54		.525	1/8	1-1/2	815350	13.90	815350-C3	18.80		
.0571		1.450 mm	.413	1/8	1-1/2	20355	13.90	20355-C3	18.80		
.0591		1.500 mm	.413	1/8	1-1/2	20360	13.90	20360-C3	18.80		
.0595	#53		.413	1/8	1-1/2	20365	13.90	20365-C3	18.80		
.0595	#53		.575	1/8	2	815365	14.60	815365-C3	19.50		
.0610		1.550 mm	.413	1/8	1-1/2	20370	13.90	20370-C3	18.80		
.0625 (1/16)			.413	1/8	1-1/2	20375	13.90	20375-C3	18.80	20375-C4	26.30
.0625 (1/16)			.600	1/8	2	815375	14.60	815375-C3	19.50		
D ₁ ^{+0.0000"} / _{-0.0005"} ***			L ₂	D ₂	L ₁	2 FL	PRICE	2 FL	PRICE	2 FL	PRICE
.0630		1.600 mm	.413	1/8	1-1/2	20376	13.90	20376-C3	18.80		
.0635	#52		.413	1/8	1-1/2	20377	13.90	20377-C3	18.80		
.0635	#52		.600	1/8	2	815377	14.60	815377-C3	19.50		
.0670	#51		.413	1/8	1-1/2	20384	13.90	20384-C3	18.80		
.0670	#51		.650	1/8	2	815384	14.60	815384-C3	19.50		

* Tolerance for all A1TiN coating is +.0002"/-.0003". *** Tolerance for A1TiN coating is +.0002"/-.0005".

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MINIATURE DRILLS

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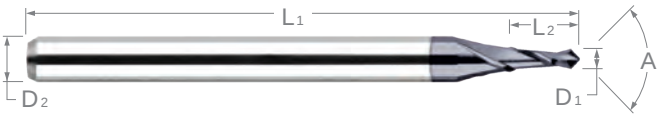
DRILL DIAMETER	FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
inch wire metric				2 FL	PRICE	2 FL	PRICE	2 FL	PRICE
D ₁ $\begin{smallmatrix} +.0000" \\ -.0005" \end{smallmatrix}$ ***	L ₂	D ₂	L ₁						
.0700 #50	.413	1/8	1-1/2	20390	13.90	20390-C3	18.80		
.0700 #50	.700	1/8	2	815390	14.60	815390-C3	19.50		
.0730 #49	.413	1/8	1-1/2	20396	13.90	20396-C3	18.80		
.0760 #48	.413	1/8	1-1/2	20402	13.90	20402-C3	18.80		
.0760 #48	.750	1/8	2	815402	14.60	815402-C3	19.50		
.0781 (5/64)	.413	1/8	1-1/2	20407	13.90	20407-C3	18.80		
.0781 (5/64)	.750	1/8	2	815407	14.60	815407-C3	19.50		
.0785 #47	.413	1/8	1-1/2	20408	13.90	20408-C3	18.80		
.0787 2.000 mm	.413	1/8	1-1/2	20409	13.90	20409-C3	18.80		
.0810 #46	.413	1/8	1-1/2	20414	13.90	20414-C3	18.80		
.0810 #46	.800	1/8	2	815414	14.60	815414-C3	19.50		
.0820 #45	.413	1/8	1-1/2	20416	13.90	20416-C3	18.80		
.0860 #44	.413	1/8	1-1/2	20424	13.90	20424-C3	18.80		
.0890 #43	.413	1/8	1-1/2	20430	13.90	20430-C3	18.80		
.0890 #43	.850	1/8	2	815430	14.60	815430-C3	19.50		
.0935 #42	.413	1/8	1-1/2	20439	13.90	20439-C3	18.80		
.0938 (3/32)	.413	1/8	1-1/2	20440	13.90	20440-C3	18.80		
.0938 (3/32)	.900	1/8	2	815440	14.60	815440-C3	19.50		
.0960 #41	.413	1/8	1-1/2	20445	13.90	20445-C3	18.80		
.0980 #40	.413	1/8	1-1/2	20449	13.90	20449-C3	18.80		
.0984 2.500 mm	.413	1/8	1-1/2	20450	13.90	20450-C3	18.80		
.0995 #39	.413	1/8	1-1/2	20453	13.90	20453-C3	18.80		
.1015 #38	.413	1/8	1-1/2	20457	13.90	20457-C3	18.80		
.1040 #37	.413	1/8	1-1/2	20462	13.90	20462-C3	18.80		
.1065 #36	.413	1/8	1-1/2	20467	13.90	20467-C3	18.80		
.1094 (7/64)	.413	1/8	1-1/2	20473	13.90	20473-C3	18.80		
.1094 (7/64)	1.100	1/8	2-1/2	815473	14.60	815473-C3	19.50		
.1100 #35	.413	1/8	1-1/2	20475	13.90	20475-C3	18.80		
.1110 #34	.413	1/8	1-1/2	20477	13.90	20477-C3	18.80		
.1130 #33	.413	1/8	1-1/2	20481	13.90	20481-C3	18.80		
.1160 #32	.413	1/8	1-1/2	20487	13.90	20487-C3	18.80		
.1181 3.000 mm	.413	1/8	1-1/2	20491	13.90	20491-C3	18.80		
.1200 #31	.413	1/8	1-1/2	20493	13.90	20493-C3	18.80		
.1250 (1/8)	.413	1/8	1-1/2	20498	13.90	20498-C3	18.80		
.1250 (1/8)	1.200	1/8	2-1/2	815498	14.60	815498-C3	19.50		

*** Tolerance for ALTiN coating is $\pm .0002"/-.0005"$.

Access **Simulation Files** in DXF format for every Harvey Tool product, downloadable from [Harveytool.com](https://www.harveytool.com)

MINIATURE DRILLS

Spotting Drills



Stocked in 10
Included Angles

- Thinned web to reduce walking
- Self-centering point geometry
- 2 flutes
- Solid carbide
- CNC ground in the USA

INCLUDED ANGLE	DRILL DIAMETER	FLUTE LENGTH	WEB THICKNESS	TYPE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AItIN COATED	
							2 FL	PRICE	2 FL	PRICE
A ^{+1°} _{-1°}	D ₁	L ₂			D ₂	L ₁				
60°	.020	.060 (3x)	.0020	I	1/8	1-1/2	932720	30.20	932720-C3	35.10
	.030	.090 (3x)	.0030	I	1/8	1-1/2	932730	29.60	932730-C3	34.50
	.031 (1/32)	.093 (3x)	.0030	I	1/8	1-1/2	932731	29.60	932731-C3	34.50
	.045	.135 (3x)	.0030	I	1/8	1-1/2	932745	25.60	932745-C3	30.50
	.060	.180 (3x)	.0050	I	1/8	1-1/2	932760	29.60	932760-C3	34.50
	.062 (1/16)	.186 (3x)	.0050	I	1/8	1-1/2	932762	29.60	932762-C3	34.50
	.090	.270 (3x)	.0050	I	1/8	1-1/2	932790	29.60	932790-C3	34.50
	.093 (3/32)	.279 (3x)	.0060	I	1/8	1-1/2	932793	29.60	932793-C3	34.50
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	932808	29.60	932808-C3	34.50
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	932811	29.60	932811-C3	34.50
82°	.187 (3/16)	.625 (3x)	.0130	II	3/16	2	932812	26.50	932812-C3	31.80
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	932816	32.00	932816-C3	39.20
	.010	.030 (3x)	.0015	I	1/8	1-1/2	983110	35.30	983110-C3	40.20
	.020	.060 (3x)	.0020	I	1/8	1-1/2	983120	30.20	983120-C3	35.10
	.030	.090 (3x)	.0030	I	1/8	1-1/2	983130	28.50	983130-C3	33.40
	.045	.135 (3x)	.0030	I	1/8	1-1/2	983145	25.60	983145-C3	30.50
	.060	.180 (3x)	.0050	I	1/8	1-1/2	983160	25.30	983160-C3	30.20
	.090	.270 (3x)	.0050	I	1/8	1-1/2	983190	24.20	983190-C3	29.10
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	983208	22.90	983208-C3	27.80
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	965208	22.90	965208-C3	27.80
90°	.187 (3/16)	.625 (3x)	.0130	II	3/16	2	965212	26.50	965212-C3	31.80
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	965216	33.00	965216-C3	40.20
	.008	.024 (3x)	.0015	I	1/8	1-1/2	11408	43.00	11408-C3	47.90
	.010	.030 (3x)	.0015	I	1/8	1-1/2	11410	34.20	11410-C3	39.10
	.010	.030 (3x)	.0015	I	1/8	3 LONG!	987910	41.00	987910-C3	45.90
	.012	.036 (3x)	.0015	I	1/8	1-1/2	11412	43.00	11412-C3	47.90
	.015 (1/64)	.045 (3x)	.0015	I	1/8	1-1/2	11415	34.20	11415-C3	39.10
	.020	.030 (1.5x)	.0020	I	1/8	1-1/2	816020	29.60	816020-C3	34.50
	.020	.060 (3x)	.0020	I	1/8	1-1/2	11420	29.60	11420-C3	34.50
	.020	.060 (3x)	.0020	I	1/8	3 LONG!	987920	36.40	987920-C3	41.30
	.025	.075 (3x)	.0020	I	1/8	1-1/2	11425	29.60	11425-C3	34.50
	.030	.045 (1.5x)	.0030	I	1/8	1-1/2	816030	27.30	816030-C3	34.40
	.030	.090 (3x)	.0030	I	1/8	1-1/2	11430	27.30	11430-C3	32.20
	.030	.090 (3x)	.0030	I	1/8	3 LONG!	987930	34.50	987930-C3	39.40
	.031 (1/32)	.093 (3x)	.0030	I	1/8	1-1/2	11431	27.30	11431-C3	32.20
	.035	.105 (3x)	.0030	I	1/8	1-1/2	11435	27.30	11435-C3	32.20
	.039 (1 mm)	.117 (3x)	.0030	I	1/8	1-1/2	11439	27.30	11439-C3	32.20

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End View

TYPE I

On center design reduces walking and minimizes flat at bottom of spot. Ideally suited for starting smaller diameter drills and shallow spots.



End View

TYPE II

Ahead of center design improves tip strength. Ideally suited for larger diameter drills and tougher materials.

MINIATURE DRILLS

Spotting Drills (cont.)

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INCLUDED ANGLE	DRILL DIAMETER	FLUTE LENGTH	WEB THICKNESS	TYPE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		AITIN COATED	
							2 FL	PRICE	2 FL	PRICE
A $\pm 1^\circ$	D ₁	L ₂			D ₂	L ₁				
90°	.040	.120 (3x)	.0030	I	1/8	1-1/2	11440	25.00	11440-C3	29.90
	.045	.068 (1.5x)	.0030	I	1/8	1-1/2	816045	25.00	816045-C3	29.90
	.045	.135 (3x)	.0030	I	1/8	1-1/2	11445	25.00	11445-C3	29.90
	.045	.135 (3x)	.0030	I	1/8	3 LONG!	987945	32.00	987945-C3	36.90
	.047 (3/64)	.141 (3x)	.0040	I	1/8	1-1/2	11447	25.00	11447-C3	29.90
	.050	.150 (3x)	.0040	I	1/8	1-1/2	11450	25.00	11450-C3	29.90
	.055	.165 (3x)	.0040	I	1/8	1-1/2	11455	25.00	11455-C3	29.90
	.060	.090 (1.5x)	.0050	I	1/8	1-1/2	816060	24.70	816060-C3	29.60
	.060	.180 (3x)	.0050	I	1/8	1-1/2	11460	24.70	11460-C3	29.60
	.060	.180 (3x)	.0050	I	1/8	3 LONG!	987960	31.60	987960-C3	36.50
	.062 (1/16)	.093 (1.5x)	.0050	I	1/8	1-1/2	816062	24.70	816062-C3	29.60
	.062 (1/16)	.186 (3x)	.0050	I	1/8	1-1/2	11462	24.70	11462-C3	29.60
	.070	.210 (3x)	.0050	I	1/8	1-1/2	11470	24.70	11470-C3	29.60
	.075	.225 (3x)	.0050	I	1/8	1-1/2	11475	24.70	11475-C3	29.60
	.078 (5/64)	.234 (3x)	.0050	I	1/8	1-1/2	11478	24.70	11478-C3	29.60
	.080	.240 (3x)	.0050	I	1/8	1-1/2	11480	24.70	11480-C3	29.60
	.090	.135 (1.5x)	.0050	I	1/8	1-1/2	816090	23.20	816090-C3	28.10
	.090	.270 (3x)	.0050	I	1/8	1-1/2	11490	23.20	11490-C3	28.10
	.090	.270 (3x)	.0050	I	1/8	3 LONG!	987990	30.40	987990-C3	35.30
	.093 (3/32)	.279 (3x)	.0060	I	1/8	1-1/2	11493	23.20	11493-C3	28.10
	.100	.300 (3x)	.0060	I	1/8	1-1/2	11500	23.20	11500-C3	28.10
	.109 (7/64)	.327 (3x)	.0080	I	1/8	1-1/2	11509	23.20	11509-C3	28.10
	.118 (3 mm)	.354 (3x)	.0080	I	1/8	1-1/2	1153M	23.20	1153M-C3	28.10
	.125 (1/8)	.188 (1.5x)	.0100	I	1/8	1-1/2	816108	21.70	816108-C3	26.60
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	11525	21.70	11525-C3	26.60
	.125 (1/8)	.375 (3x)	.0100	I	1/8	3 LONG!	988008	29.60	988008-C3	34.50
	.125 (1/8)	.188 (1.5x)	.0100	II	1/8	1-1/2	787708	21.70	787708-C3	26.60
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	37508	21.70	37508-C3	26.60
	.125 (1/8)	.375 (3x)	.0100	II	1/8	4 LONG!	55808	31.40	55808-C3	36.70
	.140 (9/64)	.375 (2.5x)	.0100	II	3/16	2	37509	31.00	37509-C3	36.30
	.156 (5/32)	.375 (2.5x)	.0110	II	3/16	2	37510	25.80	37510-C3	31.10
	.187 (3/16)	.625 (3.5x)	.0130	I	3/16	2	803912	25.00	803912-C3	30.30
	.187 (3/16)	.312 (1.5x)	.0130	II	3/16	2	787712	25.00	787712-C3	30.30
	.187 (3/16)	.625 (3.5x)	.0130	II	3/16	2	37512	25.00	37512-C3	30.30
	.187 (3/16)	.625 (3.5x)	.0130	II	3/16	4 LONG!	55812	38.60	55812-C3	45.80
	.218 (7/32)	.750 (3.5x)	.0150	II	1/4	2-1/2	37514	39.70	37514-C3	46.90
	.236 (6 mm)	.750 (3x)	.0160	II	1/4	2-1/2	37515	39.70	37515-C3	46.90
	.250 (1/4)	.750 (3x)	.0180	I	1/4	2-1/2	803916	31.10	803916-C3	38.30
	.250 (1/4)	.375 (1.5x)	.0180	II	1/4	2-1/2	787716	31.10	787716-C3	38.30
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	37516	31.10	37516-C3	38.30
	.250 (1/4)	.750 (3x)	.0180	II	1/4	6 LONG!	55816	52.20	55816-C3	61.70
	.312 (5/16)	.750 (2.5x)	.0220	II	5/16	2-1/2	37520	53.40	37520-C3	61.80
	.375 (3/8)	.500 (1.5x)	.0270	II	3/8	2-1/2	787724	56.60	787724-C3	66.10
	.375 (3/8)	1.000 (2.5x)	.0270	II	3/8	2-1/2	37524	56.60	37524-C3	66.10
	.500 (1/2)	1.000 (2x)	.0350	II	1/2	3	37532	97.80	37532-C3	112.00
100°	.030	.090 (3x)	.0030	I	1/8	1-1/2	975830	28.50	975830-C3	33.40
	.060	.180 (3x)	.0050	I	1/8	1-1/2	975860	25.30	975860-C3	30.20
	.090	.270 (3x)	.0050	I	1/8	1-1/2	975890	25.60	975890-C3	30.50
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	975908	22.90	975908-C3	27.80
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	955908	22.90	955908-C3	27.80
	.187 (3/16)	.625 (3x)	.0130	II	3/16	2	955912	26.50	955912-C3	31.80
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	955916	33.00	955916-C3	40.20

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MINIATURE DRILLS

Spotting Drills (cont.)

continued from previous page

INCLUDED ANGLE	DRILL DIAMETER	FLUTE LENGTH	WEB THICKNESS	TYPE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		A1TiN COATED	
A $\pm 1^\circ$	D ₁	L ₂			D ₂	L ₁	2 FL	PRICE	2 FL	PRICE
120°	.010	.030 (3x)	.0015	I	1/8	1-1/2	11610	34.20	11610-C3	39.10
	.015 (1/64)	.045 (3x)	.0015	I	1/8	1-1/2	11615	34.20	11615-C3	39.10
	.020	.060 (3x)	.0020	I	1/8	1-1/2	11620	29.60	11620-C3	34.50
	.025	.075 (3x)	.0020	I	1/8	1-1/2	11625	29.60	11625-C3	34.50
	.030	.090 (3x)	.0030	I	1/8	1-1/2	11630	27.30	11630-C3	32.20
	.031 (1/32)	.093 (3x)	.0030	I	1/8	1-1/2	11631	27.30	11631-C3	32.20
	.040	.120 (3x)	.0030	I	1/8	1-1/2	11640	25.00	11640-C3	29.90
	.045	.135 (3x)	.0030	I	1/8	1-1/2	11645	25.00	11645-C3	29.90
	.047 (3/64)	.141 (3x)	.0040	I	1/8	1-1/2	11647	25.00	11647-C3	29.90
	.050	.150 (3x)	.0040	I	1/8	1-1/2	11650	25.00	11650-C3	29.90
	.055	.165 (3x)	.0040	I	1/8	1-1/2	11655	25.00	11655-C3	29.90
	.060	.180 (3x)	.0050	I	1/8	1-1/2	11660	24.70	11660-C3	29.60
	.062 (1/16)	.186 (3x)	.0050	I	1/8	1-1/2	11662	24.70	11662-C3	29.60
	.070	.210 (3x)	.0050	I	1/8	1-1/2	11670	24.70	11670-C3	29.60
	.078 (5/64)	.234 (3x)	.0050	I	1/8	1-1/2	11678	24.70	11678-C3	29.60
	.090	.270 (3x)	.0050	I	1/8	1-1/2	11690	23.20	11690-C3	28.10
	.093 (3/32)	.279 (3x)	.0060	I	1/8	1-1/2	11693	23.20	11693-C3	28.10
	.100	.300 (3x)	.0060	I	1/8	1-1/2	11700	23.20	11700-C3	28.10
	.118 (3 mm)	.354 (3x)	.0080	I	1/8	1-1/2	1173M	23.20	1173M-C3	28.10
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	11725	21.70	11725-C3	26.60
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	38208	21.70	38208-C3	26.60
130°	.156 (5/32)	.375 (2.5x)	.0110	II	3/16	2	38210	48.40	38210-C3	53.70
	.187 (3/16)	.625 (3.5x)	.0130	I	3/16	2	804012	25.00	804012-C3	30.30
	.187 (3/16)	.625 (3.5x)	.0130	II	3/16	2	38212	25.00	38212-C3	30.30
	.250 (1/4)	.750 (3x)	.0180	I	1/4	2-1/2	804016	31.10	804016-C3	38.30
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	38216	31.10	38216-C3	38.30
140°	.375 (3/8)	1.000 (2.5x)	.0270	II	3/8	2-1/2	38224	56.60	38224-C3	66.10
	.030	.090 (3x)	.0030	I	1/8	1-1/2	839530	31.40	839530-C3	36.10
	.060	.180 (3x)	.0050	I	1/8	1-1/2	839560	31.40	839560-C3	36.10
	.090	.270 (3x)	.0050	I	1/8	1-1/2	839590	31.40	839590-C3	36.10
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	839608	33.00	839608-C3	37.50
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	847016	34.40	847016-C3	41.60
	.010	.030 (3x)	.0015	I	1/8	1-1/2	39810	35.30	39810-C3	40.20
	.015 (1/64)	.045 (3x)	.0015	I	1/8	1-1/2	39815	35.30	39815-C3	40.20
	.020	.030 (1.5x)	.0020	I	1/8	1-1/2	815820	30.20	815820-C3	35.10
	.020	.060 (3x)	.0020	I	1/8	1-1/2	39820	30.20	39820-C3	35.10
	.025	.075 (3x)	.0020	I	1/8	1-1/2	39825	30.20	39825-C3	35.10
	.030	.045 (1.5x)	.0030	I	1/8	1-1/2	815830	28.50	815830-C3	33.40
	.030	.090 (3x)	.0030	I	1/8	1-1/2	39830	28.50	39830-C3	33.40
	.031 (1/32)	.093 (3x)	.0030	I	1/8	1-1/2	39831	28.50	39831-C3	33.40
	.040	.060 (1.5x)	.0030	I	1/8	1-1/2	815840	25.60	815840-C3	30.50
	.040	.120 (3x)	.0030	I	1/8	1-1/2	39840	25.60	39840-C3	30.50
	.045	.135 (3x)	.0030	I	1/8	1-1/2	39845	25.60	39845-C3	30.50
	.047 (3/64)	.141 (3x)	.0040	I	1/8	1-1/2	39847	25.60	39847-C3	30.50
	.050	.150 (3x)	.0040	I	1/8	1-1/2	39850	25.60	39850-C3	30.50
	.055	.165 (3x)	.0040	I	1/8	1-1/2	39855	25.60	39855-C3	30.50
	.060	.090 (1.5x)	.0050	I	1/8	1-1/2	815860	25.30	815860-C3	30.20
	.060	.180 (3x)	.0050	I	1/8	1-1/2	39860	25.30	39860-C3	30.20
	.062 (1/16)	.186 (3x)	.0050	I	1/8	1-1/2	39862	25.30	39862-C3	30.20

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MINIATURE DRILLS

Spotting Drills (cont.)

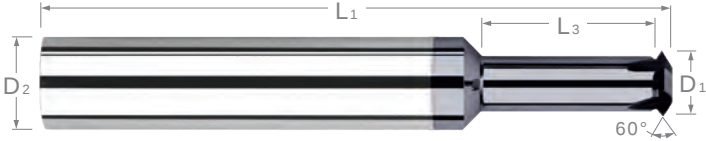
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INCLUDED ANGLE	DRILL DIAMETER	FLUTE LENGTH	WEB THICKNESS	TYPE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED		A TiN COATED	
A $^{+1^{\circ}}_{-1^{\circ}}$	D ₁	L ₂			D ₂	L ₁	2 FL	PRICE	2 FL	PRICE
140°	.070	.210 (3x)	.0050	I	1/8	1-1/2	39870	25.30	39870-C3	30.20
	.075	.225 (3x)	.0050	I	1/8	1-1/2	39875	25.30	39875-C3	30.20
	.078 (5/64)	.234 (3x)	.0050	I	1/8	1-1/2	39878	25.30	39878-C3	30.20
	.090	.135 (1.5x)	.0050	I	1/8	1-1/2	815890	24.20	815890-C3	29.10
	.090	.270 (3x)	.0050	I	1/8	1-1/2	39890	24.20	39890-C3	29.10
	.093 (3/32)	.279 (3x)	.0060	I	1/8	1-1/2	39893	24.20	39893-C3	29.10
	.100	.300 (3x)	.0060	I	1/8	1-1/2	39900	24.20	39900-C3	29.10
	.118 (3mm)	.354 (3x)	.0080	I	1/8	1-1/2	3993M	24.20	3993M-C3	29.10
	.125 (1/8)	.188 (1.5x)	.0100	I	1/8	1-1/2	815908	22.90	815908-C3	27.80
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	39925	22.90	39925-C3	27.80
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	41008	22.90	41008-C3	27.80
	.140 (9/64)	.375 (2.5x)	.0100	II	3/16	2	41009	26.50	41009-C3	31.80
	.156 (5/32)	.375 (2.5x)	.0110	II	3/16	2	41010	26.50	41010-C3	31.80
	.187 (3/16)	.625 (3x)	.0130	I	3/16	2	804112	26.50	804112-C3	31.80
	.187 (3/16)	.625 (3x)	.0130	II	3/16	2	41012	26.50	41012-C3	31.80
	.250 (1/4)	.750 (3x)	.0180	I	1/4	2-1/2	804116	33.00	804116-C3	40.20
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	41016	33.00	41016-C3	40.20
	.375 (3/8)	1.000 (2.5x)	.0270	II	3/8	2-1/2	41024	58.20	41024-C3	67.70
142°	.060	.180 (3x)	.005	I	1/8	1-1/2	752560	28.80	752560-C3	33.70
	.090	.270 (3x)	.005	I	1/8	1-1/2	752590	28.80	752590-C3	33.70
	.125 (1/8)	.375 (3x)	.010	I	1/8	1-1/2	752608	28.80	752608-C3	33.70
150°	.020	.060 (3x)	.0020	I	1/8	1-1/2	961120	28.50	961120-C3	33.40
	.030	.090 (3x)	.0030	I	1/8	1-1/2	961130	28.50	961130-C3	33.40
	.040	.120 (3x)	.0030	I	1/8	1-1/2	961140	25.60	961140-C3	30.50
	.045	.135 (3x)	.0030	I	1/8	1-1/2	961145	25.60	961145-C3	30.50
	.047	.141 (3x)	.0040	I	1/8	1-1/2	961147	25.60	961147-C3	30.50
	.060	.180 (3x)	.0050	I	1/8	1-1/2	961160	25.30	961160-C3	30.20
	.062 (1/16)	.186 (3x)	.0050	I	1/8	1-1/2	961162	25.60	961162-C3	30.50
	.078 (5/64)	.234 (3x)	.0050	I	1/8	1-1/2	961178	25.60	961178-C3	30.50
	.090	.270 (3x)	.0050	I	1/8	1-1/2	961190	25.60	961190-C3	30.50
	.093 (3/32)	.279 (3x)	.0060	I	1/8	1-1/2	961193	25.60	961193-C3	30.50
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	961208	22.90	961208-C3	27.80
	.125 (1/8)	.375 (3x)	.0100	II	1/8	1-1/2	949508	22.90	949508-C3	27.80
	.187 (3/16)	.625 (3x)	.0130	II	3/16	2	949512	26.50	949512-C3	31.80
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	949516	33.00	949516-C3	40.20
170°	.060	.180 (3x)	.0050	I	1/8	1-1/2	893660	25.60	893660-C3	30.50
	.125 (1/8)	.375 (3x)	.0100	I	1/8	1-1/2	893708	25.60	893708-C3	30.50
	.250 (1/4)	.750 (3x)	.0180	II	1/4	2-1/2	893716	33.00	893716-C3	40.20



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THREAD SIZE	CUTTER DIA. $D_1 \begin{smallmatrix} +.00 \text{ mm} \\ -.05 \text{ mm} \end{smallmatrix}$	NECK DIA. $L_3 \begin{smallmatrix} +.50 \text{ mm} \\ -.00 \text{ mm} \end{smallmatrix}$	MAX DEPTH OF THREAD D_2	FLUTES	SHANK DIA. L_1	OVERALL LENGTH	UNCOATED		AITIN COATED	
							TOOL #	PRICE	TOOL #	PRICE
M1.6	1.16 mm	.696 mm	2.10 mm	2	3 mm	38 mm	890316	78.50	890316-C3	83.40
M1.6	1.16 mm	.696 mm	3.50 mm	2	3 mm	38 mm	882116	78.50	882116-C3	83.40
M1.6	1.16 mm	.696 mm	5.60 mm	2	3 mm	38 mm	826516	80.80	826516-C3	85.70
M2	1.50 mm	.900 mm	2.70 mm	2	3 mm	38 mm	890319	78.50	890319-C3	83.40
M2	1.50 mm	.900 mm	4.50 mm	2	3 mm	38 mm	882119	78.50	882119-C3	83.40
M2	1.50 mm	.900 mm	7.00 mm	2	3 mm	38 mm	826519	80.80	826519-C3	85.70
M2	1.50 mm	.900 mm	9.00 mm	2	3 mm	38 mm	761419	82.00	761419-C3	86.90
M2.5	1.90 mm	1.140 mm	3.50 mm	2	3 mm	38 mm	890322	78.50	890322-C3	83.40
M2.5	1.90 mm	1.140 mm	5.80 mm	2	3 mm	38 mm	882122	78.50	882122-C3	83.40
M2.5	1.90 mm	1.140 mm	9.00 mm	2	3 mm	38 mm	826522	80.80	826522-C3	85.70
M3	2.30 mm	1.380 mm	4.00 mm	4	3 mm	38 mm	890324	78.50	890324-C3	83.40
M3	2.30 mm	1.380 mm	6.80 mm	4	3 mm	38 mm	882124	78.50	882124-C3	83.40
M3	2.30 mm	1.380 mm	11.00 mm	4	3 mm	38 mm	826524	80.80	826524-C3	85.70
M3	2.30 mm	1.380 mm	14.00 mm	4	3 mm	38 mm	761424	82.00	761424-C3	86.90
M4	3.00 mm	1.800 mm	5.50 mm	4	3 mm	38 mm	890326	79.60	890326-C3	84.50
M4	3.00 mm	1.800 mm	9.00 mm	4	3 mm	38 mm	882126	80.80	882126-C3	85.70
M4	3.00 mm	1.800 mm	14.00 mm	4	3 mm	38 mm	826526	83.20	826526-C3	88.10
M4	3.00 mm	1.800 mm	18.00 mm	4	3 mm	50 mm	761426	84.40	761426-C3	89.30
M5	4.00 mm	2.400 mm	7.00 mm	4	4 mm	50 mm	890328	80.80	890328-C3	86.10
M5	4.00 mm	2.400 mm	12.00 mm	4	4 mm	50 mm	882128	83.20	882128-C3	88.50
M5	4.00 mm	2.400 mm	19.00 mm	4	4 mm	50 mm	826528	85.90	826528-C3	91.20
M6	4.80 mm	2.880 mm	8.50 mm	4	6 mm	50 mm	890330	79.60	890330-C3	86.80
M6	4.80 mm	2.880 mm	14.00 mm	4	6 mm	50 mm	882130	80.80	882130-C3	88.00
M6	4.80 mm	2.880 mm	23.00 mm	4	6 mm	63 mm	826530	87.10	826530-C3	94.30
M8	6.00 mm	3.600 mm	11.00 mm	4	6 mm	50 mm	890332	80.80	890332-C3	88.00
M8	6.00 mm	3.600 mm	18.00 mm	4	6 mm	50 mm	882132	85.90	882132-C3	93.10
M10	8.00 mm	4.800 mm	15.00 mm	4	8 mm	63 mm	890334	104.70	890334-C3	113.10
M10	8.00 mm	4.800 mm	24.00 mm	4	8 mm	63 mm	882134	110.20	882134-C3	118.60
M16	13.70 mm	8.220 mm	25.00 mm	6	14 mm	75 mm	890339	123.50	890339-C3	137.70
M16	13.70 mm	8.220 mm	42.00 mm	6	14 mm	89 mm	882139	136.00	882139-C3	150.20