PREMIERING
2023
PRODUCT
CATALOG

VALOR™ HOLEMAKING

Victory Starts With Valor Holemaking

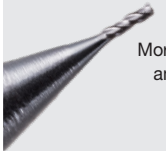
INTRODUCING A NEW ERA OF CNC DRILLING

Introducing a New Era of CNC Drilling

Rethink your holemaking routine with Valor Holemaking's new line of the world's most premium quality, high performance drills and holemaking solutions. Our products are meticulously tested, engineered, and manufactured in the USA to deliver excellent service levels and quality that your shop deserves.

Manufactured in the USA

HARVEY PERFORMANCE COMPANY



HARVEY TOOL

Think Harvey Tool First

More than 28,000 miniature and specialty end mills. Ship today, in your machine tomorrow.

Helical

Let Helical Impress You

Material-optimized high performance carbide end mills. Run faster, push harder, machine smarter.

MICRO 100

Make More with Micro 100

Exceptional quality turning tools designed for durability and performance in a range of difficult-to-machine materials.

TITAN USA

MADE IN THE U.S.A.

Trust in Titan USA

Broad assortment of quality, fully stocked cutting tools at exceptional value.

COREHOG

Innovative Tools for Innovative Materials

The industry's most innovative and advanced composite and honeycomb core cutting tools.

VALOR HOLEMAKING

Victory Starts with Valor Holemaking

High performance drills & complementary tooling solutions that revolutionize CNC holemaking.

From the experts behind **Helical Solutions'** High Performance End Mills, comes a **new brand** that delivers on what you want most from your drills.

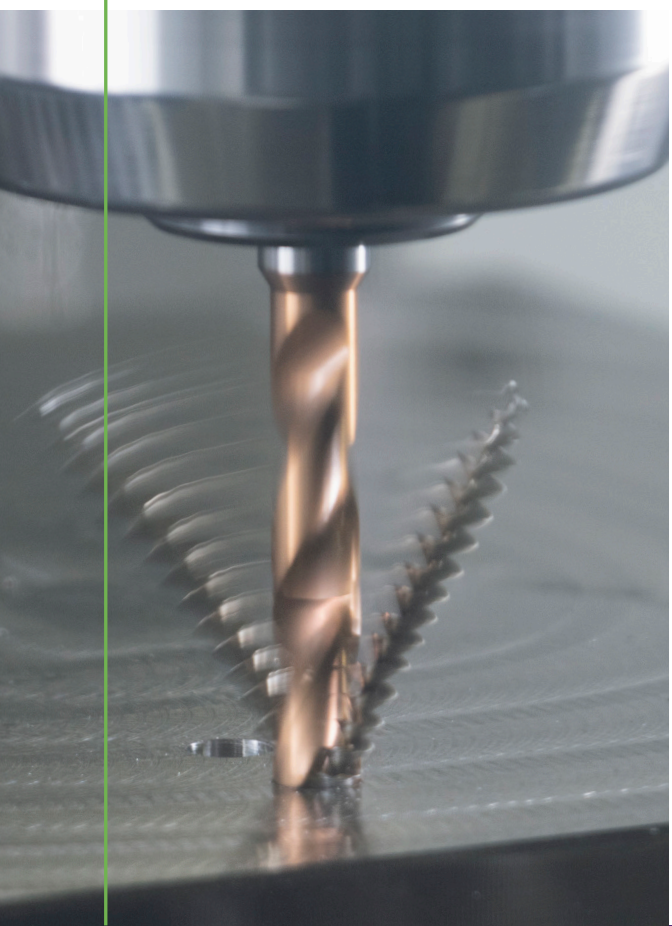
- **Superior Hole Quality & Performance**
- **Reduced Cost-Per-Hole**
- **Reliable, Fully Stocked Inventory**
- **Engineered & Manufactured in the USA.**

Victory Starts With Valor Holemaking

OUR OFFERING

Outstanding Hole Accuracy & Repeatability

Enjoy incredible repeatability, reliability, and part-to-part consistency with drills meticulously tested to deliver impeccable hole circularity, straightness, and true position that matches the best in the industry.



Exceptional Surface Finish

Achieve impressive surface finish that increases your through put, reduces your scraps, and eliminates post-processing operations. Our High Performance Drill geometries undergo a precision edge prep, coating, and post-polish process, allowing chips to effectively evacuate up and out of a part with minimal entry and exit burrs.

Amazing Tool Life & Performance

Rely on industry-leading material-specific geometry and coatings that minimize stress and breakage, resulting in reduced cutting forces, high quality holes, and long tool life.

Impressive Cost-Per-Hole Results

Get an immediate boost to your shop's efficiency by realizing impressive cost-per-hole results. Our High Performance Drills are priced competitively, built to last, and engineered to drill more quickly, effectively, and reliably, providing you with unbeatable cost savings.

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Combined Drill & Countersinks

High Performance Chamfer Cutters

COUNTERBORING

Counterbores

THREADING

Thread Mills – Multi-Form

Val-Max Coating Technology

Valor Holemaking's proprietary high performance coating technology is specially engineered to revolutionize your drilling operations. At Valor, we select each coating to provide the best performance in the material it's optimized for, so you can drill more high quality holes with Valor tooling.

	Val-Max V	Val-Max X
		
Application Benefits	Val-Max V technology provides tooling with higher hardness, lubricity, and abrasion resistance to deliver outstanding performance in aluminum with high silicon content, and a variety of other non-ferrous materials.	Val-Max X technology is specially engineered to improve tool life and heat resistance in a wide variety of ferrous materials. Achieve excellent performance in difficult-to-machine materials including alloy steels, stainless steels, nickel alloys, and other high hardness materials up to 65 Rc.
Materials	Wrought Aluminum, Cast Aluminum, and Non-Ferrous Materials	Alloy Steels, Stainless Steels, Hardened Steels, Cast Iron, and Nickel Alloys
Coating Appearance	Light Gold / Champagne	Copper
Max Temperature Usage	1,110° F	2,192° F
Microhardness (HV 0.05)	2243 (22 GPa)	4487 (44 GPa)
Coefficient of Friction	0.40	0.35

Tolerance Chart

High Performance Drills & Spotting Drills

Diameter (mm)	Drill Diameter D_1 (h8)		Shank Diameter D_2 (h6)	
	inch	microns	inch	microns
0 mm - 3 mm	+0″ / −.0006″	+0 µm / −14 µm	+0″ / − .0002″	+0 µm / −6 µm
3 mm - 6 mm	+0″ / −.0007″	+0 µm / −18 µm	+0″ / −.0003″	+0 µm / −8 µm
6 mm - 10 mm	+0″ / −.0009″	+0 µm / −22 µm	+0″ / −.0004″	+0 µm / −9 µm
10 mm - 18 mm	+0″ / −.0011″	+0 µm / −27 µm	+0″ / −.0004″	+0 µm / −11 µm

The Cutting-Edge Resource You Need to Take You Further at the Spindle

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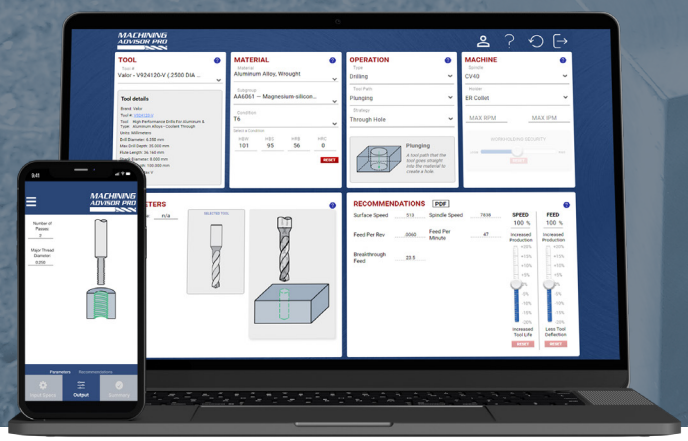


Take your **Valor Holemaking** products further by generating and following customized running parameters for your specific setup and workpiece material.

CAM Partners

Valor Holemaking is proud to partner with these industry-leading CAM software packages so using our tools is as simple as possible.

Valuable Time Savings

Import tool libraries directly into CAM software, so you can spend more time at the machine.

Confident Machining

Program confidently with accurate tool dimensions and CAM-specific tool data.

Growing Libraries & Partnerships

Count on up-to-date product libraries across a roster of leading CAM partners.

Download Tool Libraries Now

AUTODESK® FUSION 360™

AUTODESK® HSM

Mastercam®

SolidCAM iMachining – The Revolution in CAM!

ESPRIT® CAM System

Build & Send Shopping Carts to Your Distributor at valorholemaking.com

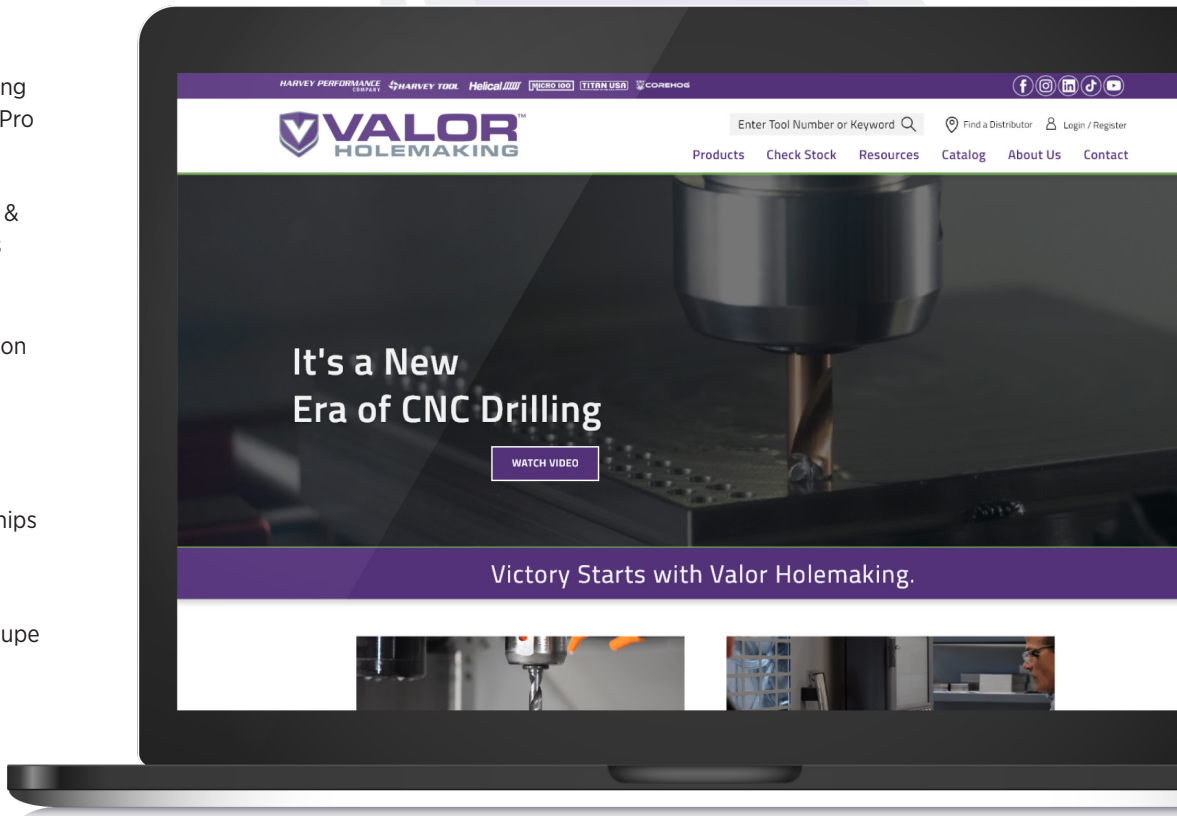
Once logged in, create your own personalized Shopping Cart of the Valor Holemaking tools you're most interested in, then send it directly to a participating distributor, or share it with a colleague or purchasing agent.

Simply and quickly search for a Valor Holemaking tool, then receive results for its product page, as well as for every technical resource relevant to that tool, presented in one click to save you valuable time and money.

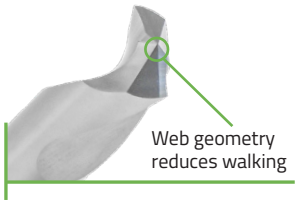
Find the perfect Valor Holemaking tool for your job quickly and easily by using the filtering functionality on each product table, sorting through an expansive and always growing product offering.

Valor Holemaking is also equipped with several technical resources, from Sim Files and Speeds & Feeds charts to CAM Tool Libraries, we complement your high quality tool with equally beneficial resources.

- Machining Advisor Pro
- Speeds & Feeds
- Simulation Files
- CAM Partnerships
- In The Loupe Blog

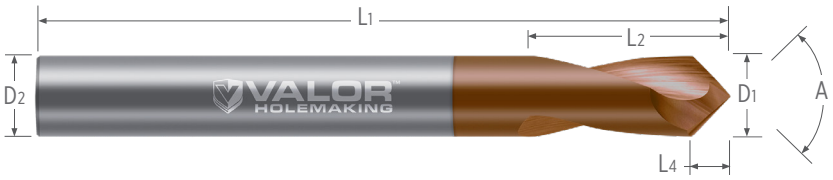


High Performance Spotting Drills



Delivers Incredible Accuracy for High Performance Drilling

- Highly engineered point design provides better positioning and stability for high performance drilling applications
- Thinned web to reduce walking
- Uncoated option well-suited for spot drilling Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Excellent for aluminum and non-ferrous alloys

Outstanding in ferrous materials

Point Angle	Drill Diameter		Flute Length (inclusive of point angle)		Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max X Coated	
	inch	metric	inch	metric							
A +2° −0°		D_1 (h8)*		L_2	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
90°	.1181	3.00 mm	.3937	**10.00 mm**	1.50 mm	3 mm	63 mm	**V528289**	28.60	**V528289-X**	35.80
	.1575	4.00 mm	.5905	**15.00 mm**	2.00 mm	4 mm	63 mm	**V401556**	31.80	**V401556-X**	40.00
	.2362	6.00 mm	.7874	**20.00 mm**	3.00 mm	6 mm	63 mm	**V133679**	49.00	**V133679-X**	58.80
	.3150	8.00 mm	.7874	**20.00 mm**	4.00 mm	8 mm	75 mm	**V925137**	66.00	**V925137-X**	80.00
	.3937	10.00 mm	.9842	**25.00 mm**	5.00 mm	10 mm	75 mm	**V870885**	69.80	**V870885-X**	86.00
	.4724	12.00 mm	1.1811	**30.00 mm**	6.00 mm	12 mm	100 mm	**V625792**	120.80	**V625792-X**	141.10
	.6299	16.00 mm	1.5748	**40.00 mm**	8.00 mm	16 mm	100 mm	**V397909**	175.80	**V397909-X**	203.90
135°	.1181	3.00 mm	.3937	**10.00 mm**	0.62 mm	3 mm	63 mm	**V828908**	28.60	**V828908-X**	35.80
	.1575	4.00 mm	.5905	**15.00 mm**	0.82 mm	4 mm	63 mm	**V578430**	31.80	**V578430-X**	40.00
	.2362	6.00 mm	.7874	**20.00 mm**	1.24 mm	6 mm	63 mm	**V126235**	49.00	**V126235-X**	58.80
	.3150	8.00 mm	.7874	**20.00 mm**	1.65 mm	8 mm	75 mm	**V965469**	66.00	**V965469-X**	80.00
	.3937	10.00 mm	.9842	**25.00 mm**	2.07 mm	10 mm	75 mm	**V856609**	69.80	**V856609-X**	86.00
	.4724	12.00 mm	1.1811	**30.00 mm**	2.48 mm	12 mm	100 mm	**V705482**	120.80	**V705482-X**	141.10
	.6299	16.00 mm	1.5748	**40.00 mm**	3.31 mm	16 mm	100 mm	**V827330**	175.80	**V827330-X**	203.90
140°	.1181	3.00 mm	.3937	**10.00 mm**	0.54 mm	3 mm	63 mm	**V261312**	28.60	**V261312-X**	35.80
	.1575	4.00 mm	.5905	**15.00 mm**	0.72 mm	4 mm	63 mm	**V589772**	31.80	**V589772-X**	40.00
	.2362	6.00 mm	.7874	**20.00 mm**	1.09 mm	6 mm	63 mm	**V661563**	49.00	**V661563-X**	58.80
	.3150	8.00 mm	.7874	**20.00 mm**	1.45 mm	8 mm	75 mm	**V102716**	66.00	**V102716-X**	80.00
	.3937	10.00 mm	.9842	**25.00 mm**	1.81 mm	10 mm	75 mm	**V634710**	69.80	**V634710-X**	86.00
	.4724	12.00 mm	1.1811	**30.00 mm**	2.18 mm	12 mm	100 mm	**V443621**	120.80	**V443621-X**	141.10
	.6299	16.00 mm	1.5748	**40.00 mm**	2.91 mm	16 mm	100 mm	**V941564**	175.80	**V941564-X**	203.90

* For h6 and h8 tolerances, see page 8.

Speeds & Feeds

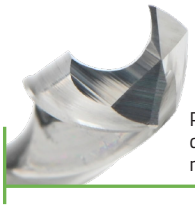
High Performance Spotting Drills

Material Guide		Hardness	SFM	Chip Load (IPR) by Drill Diameter						
				1/8	3/16	1/4	3/8	1/2	5/8	3/4
Carbon Steels	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	29-37 Rc (279-344 HBn)	150	.00270	.00404	.00540	.00810	.01080	.01350	.01620
Low Alloy Steels	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	29-37 Rc (279-344 HBn)	240	.00295	.00442	.00591	.00886	.01181	.01477	.01772
Tool Steels	A, L, O, P, W series	29-37 Rc (279-344 HBn)	125	.00270	.00404	.00540	.00810	.01080	.01350	.01620
		38-45 Rc (353-421 HBn)	100	.00180	.00269	.00360	.00540	.00720	.00900	.01080
	D, H, M, T, S series	29-37 Rc (279-344 HBn)	90	.00169	.00252	.00338	.00506	.00675	.00844	.01013
		38-45 Rc (353-421 HBn)	75	.00113	.00168	.00225	.00338	.00450	.00563	.00675
Austenitic Stainless Steels	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	29-37 Rc (279-344 HBn)	180	.00295	.00442	.00591	.00886	.01181	.01477	.01772
Martensitic & Ferritic Stainless Steels	403, 410, 416, 420, 440, 430, 446	29-37 Rc (279-344 HBn)	150	.00270	.00404	.00540	.00810	.01080	.01350	.01620
		38-45 Rc (353-421 HBn)	100	.00180	.00269	.00360	.00540	.00720	.00900	.01080
PH Stainless Steels	15-5, 17-4, Carpenter 450, Carpenter 465	29-37 Rc (279-344 HBn)	125	.00169	.00252	.00338	.00506	.00675	.00844	.01013
		38-45 Rc (353-421 HBn)	90	.00113	.00168	.00225	.00338	.00450	.00563	.00675
Nickel Alloys	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	29-37 Rc (279-344 HBn)	70	.00169	.00252	.00338	.00506	.00675	.00844	.01013
		38-45 Rc (353-421 HBn)	50	.00113	.00168	.00225	.00338	.00450	.00563	.00675
Titanium Alloys	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	29-37 Rc (279-344 HBn)	100	.00169	.00252	.00338	.00506	.00675	.00844	.01013
		38-45 Rc (353-421 HBn)	75	.00113	.00168	.00225	.00338	.00450	.00563	.00675
Wrought Aluminum Alloys	2014, 5062, 6061, 7050, 7075, 7475	≤ 28 Rc (≤ 271 HBn)	600	.00338	.00505	.00675	.01013	.01350	.01688	.02025
	5% - 8% Si (4XXX)		600	.00304	.00454	.00608	.00911	.01215	.01519	.01823
	8% - 12% Si (4XXX)		480							
Cast Aluminum Alloys	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	≤ 28 Rc (≤ 271 HBn)	450	.00338	.00505	.00675	.01013	.01350	.01688	.02025
	3% - 5% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		450	.00304	.00454	.00608	.00911	.01215	.01519	.01823
	5% - 8% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		420							
	8% - 12% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		390							
	12% - 16% Si (3XX, A3XX, C3XX, 4XX, A4XX, B4XX)		350							
Copper Alloys	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	≤ 28 Rc (≤ 271 HBn)	170-400	.00270	.00404	.00540	.00810	.01080	.01350	.01620
Magnesium Alloys	—	≤ 28 Rc (≤ 271 HBn)	900	.00338	.00505	.00675	.01013	.01350	.01688	.02025
Zinc Alloys			480							

General Notes

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased 10%-20% if coated. For ferrous materials with hardness ≤ 28 Rc, chip loads can be increased 10%-20%.

If you require additional information, Valor Holemaking has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **866-840-1505** or **Valortech@harveyperformance.com**.



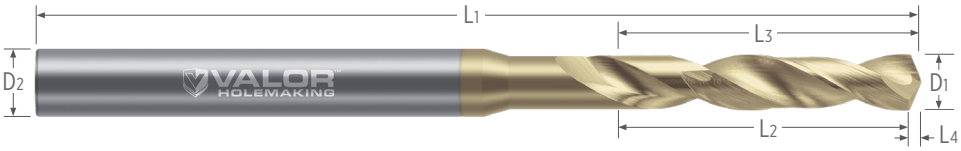
Point geometry designed to minimize burrs

High Performance Drills

For Aluminum & Aluminum Alloys

Best-In-Class for High Performance Drilling in 6061 Aluminum

- Optimized for best-in-class performance in 6061 Aluminum with superior performance in Aluminum and Aluminum Alloys
- Provides excellent performance in other Non-Ferrous Alloys
- Geometry is designed to provide minimal entry and exit burrs
- Engineered cylindrical margin design ensures stability and improved performance
- Pre and post polish process delivers reduced friction and ensures outstanding chip management
- 135° point angle with 4-facet geometry for improved self-centering
- h6 shank tolerance for high precision tool holders
- Proprietary Val-Max V coating delivers outstanding performance in Aluminum Alloys and other Non-Ferrous Alloys
- Solid carbide



Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.0625 (1/16)	1.587 mm	.221	**5.60 mm**	**(3x)**	5.93 mm	.33 mm	3 mm	63 mm	**V194685**	43.50	**V194685-V**	49.00
.0625 (1/16)	1.587 mm	.343	**8.70 mm**	**(5x)**	9.03 mm	.33 mm	3 mm	63 mm	**V810911**	80.00	**V810911-V**	85.50
.0630	1.600 mm	.221	**5.60 mm**	**(3x)**	5.93 mm	.33 mm	3 mm	63 mm	**V350774**	43.50	**V350774-V**	49.00
.0630	1.600 mm	.347	**8.80 mm**	**(5x)**	9.13 mm	.33 mm	3 mm	63 mm	**V440239**	80.00	**V440239-V**	85.50
.0669	1.700 mm	.236	**6.00 mm**	**(3x)**	6.35 mm	.35 mm	3 mm	63 mm	**V912750**	43.50	**V912750-V**	49.00
.0669	1.700 mm	.366	**9.30 mm**	**(5x)**	9.65 mm	.35 mm	3 mm	63 mm	**V962712**	80.00	**V962712-V**	85.50
.0708	1.800 mm	.248	**6.30 mm**	**(3x)**	6.67 mm	.37 mm	3 mm	63 mm	**V354482**	43.50	**V354482-V**	49.00
.0708	1.800 mm	.390	**9.90 mm**	**(5x)**	10.27 mm	.37 mm	3 mm	63 mm	**V269342**	80.00	**V269342-V**	85.50
.0748	1.900 mm	.260	**6.60 mm**	**(3x)**	6.99 mm	.39 mm	3 mm	63 mm	**V491940**	43.50	**V491940-V**	49.00
.0748	1.900 mm	.409	**10.40 mm**	**(5x)**	10.79 mm	.39 mm	3 mm	63 mm	**V732481**	80.00	**V732481-V**	85.50
.0781 (5/64)	1.984 mm	.272	**6.90 mm**	**(3x)**	7.31 mm	.41 mm	3 mm	63 mm	**V380076**	43.50	**V380076-V**	49.00
.0781 (5/64)	1.984 mm	.429	**10.90 mm**	**(5x)**	11.31 mm	.41 mm	3 mm	63 mm	**V870254**	80.00	**V870254-V**	85.50
.0787	2.000 mm	.276	**7.00 mm**	**(3x)**	7.41 mm	.41 mm	3 mm	63 mm	**V692266**	43.50	**V692266-V**	49.00
.0787	2.000 mm	.433	**11.00 mm**	**(5x)**	11.41 mm	.41 mm	3 mm	63 mm	**V843172**	80.00	**V843172-V**	85.50
.0826	2.100 mm	.291	**7.40 mm**	**(3x)**	7.83 mm	.43 mm	3 mm	63 mm	**V352580**	43.50	**V352580-V**	49.00
.0826	2.100 mm	.457	**11.60 mm**	**(5x)**	12.03 mm	.43 mm	3 mm	63 mm	**V249129**	80.00	**V249129-V**	85.50

* For h6 and h8 tolerances, see page 8.

continued on next page

Stocked in 3x and 5x hole depths

High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

continued from previous page

Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.0866	2.200 mm	.303	**7.70 mm**	**(3x)**	8.16 mm	.46 mm	3 mm	63 mm	**V666234**	43.50	**V666234-V**	49.00
.0866	2.200 mm	.476	**12.10 mm**	**(5x)**	12.56 mm	.46 mm	3 mm	63 mm	**V259897**	80.00	**V259897-V**	85.50
.0905	2.300 mm	.315	**8.00 mm**	**(3x)**	8.48 mm	.48 mm	3 mm	63 mm	**V599496**	43.50	**V599496-V**	49.00
.0905	2.300 mm	.496	**12.60 mm**	**(5x)**	13.08 mm	.48 mm	3 mm	63 mm	**V652049**	80.00	**V652049-V**	85.50
.0937 (3/32)	2.381 mm	.327	**8.30 mm**	**(3x)**	8.79 mm	.49 mm	3 mm	63 mm	**V538054**	43.50	**V538054-V**	49.00
.0937 (3/32)	2.381 mm	.516	**13.10 mm**	**(5x)**	13.59 mm	.49 mm	3 mm	63 mm	**V572375**	80.00	**V572375-V**	85.50
.0944	2.400 mm	.331	**8.40 mm**	**(3x)**	8.90 mm	.50 mm	3 mm	63 mm	**V431788**	43.50	**V431788-V**	49.00
.0944	2.400 mm	.520	**13.20 mm**	**(5x)**	13.70 mm	.50 mm	3 mm	63 mm	**V785917**	80.00	**V785917-V**	85.50
.0984	2.500 mm	.347	**8.80 mm**	**(3x)**	9.32 mm	.52 mm	3 mm	63 mm	**V536698**	43.50	**V536698-V**	49.00
.0984	2.500 mm	.543	**13.80 mm**	**(5x)**	14.32 mm	.52 mm	3 mm	63 mm	**V445649**	80.00	**V445649-V**	85.50
.1023	2.600 mm	.358	**9.10 mm**	**(3x)**	9.64 mm	.54 mm	3 mm	63 mm	**V315845**	43.50	**V315845-V**	49.00
.1023	2.600 mm	.563	**14.30 mm**	**(5x)**	14.84 mm	.54 mm	3 mm	63 mm	**V788414**	80.00	**V788414-V**	85.50
.1062	2.700 mm	.374	**9.50 mm**	**(3x)**	10.06 mm	.56 mm	3 mm	63 mm	**V481040**	43.50	**V481040-V**	49.00
.1062	2.700 mm	.587	**14.90 mm**	**(5x)**	15.46 mm	.56 mm	3 mm	63 mm	**V165528**	80.00	**V165528-V**	85.50
.1093 (7/64)	2.778 mm	.382	**9.70 mm**	**(3x)**	10.28 mm	.58 mm	3 mm	63 mm	**V954203**	43.50	**V954203-V**	49.00
.1093 (7/64)	2.778 mm	.602	**15.30 mm**	**(5x)**	15.88 mm	.58 mm	3 mm	63 mm	**V195817**	80.00	**V195817-V**	85.50
.1102	2.800 mm	.386	**9.80 mm**	**(3x)**	10.38 mm	.58 mm	3 mm	63 mm	**V838163**	43.50	**V838163-V**	49.00
.1102	2.800 mm	.606	**15.40 mm**	**(5x)**	15.98 mm	.58 mm	3 mm	63 mm	**V802613**	80.00	**V802613-V**	85.50
.1141	2.900 mm	.402	**10.20 mm**	**(3x)**	10.80 mm	.60 mm	3 mm	63 mm	**V729681**	43.50	**V729681-V**	49.00
.1141	2.900 mm	.626	**15.90 mm**	**(5x)**	16.50 mm	.60 mm	3 mm	63 mm	**V960568**	80.00	**V960568-V**	85.50
.1181	3.000 mm	.417	**10.60 mm**	**(3x)**	11.22 mm	.62 mm	4 mm	63 mm	**V438428**	43.50	**V438428-V**	50.00
.1181	3.000 mm	.654	**16.60 mm**	**(5x)**	17.22 mm	.62 mm	4 mm	63 mm	**V116498**	80.00	**V116498-V**	86.50
.1220	3.100 mm	.425	**10.80 mm**	**(3x)**	11.44 mm	.64 mm	4 mm	63 mm	**V793541**	43.50	**V793541-V**	50.00
.1220	3.100 mm	.669	**17.00 mm**	**(5x)**	17.64 mm	.64 mm	4 mm	63 mm	**V569668**	80.00	**V569668-V**	86.50
.1250 (1/8)	3.175 mm	.441	**11.20 mm**	**(3x)**	11.86 mm	.66 mm	4 mm	63 mm	**V367456**	43.50	**V367456-V**	50.00
.1250 (1/8)	3.175 mm	.685	**17.40 mm**	**(5x)**	18.06 mm	.66 mm	4 mm	63 mm	**V844439**	80.00	**V844439-V**	86.50
.1260	3.200 mm	.441	**11.20 mm**	**(3x)**	11.86 mm	.66 mm	4 mm	63 mm	**V660156**	43.50	**V660156-V**	50.00
.1260	3.200 mm	.693	**17.60 mm**	**(5x)**	18.26 mm	.66 mm	4 mm	63 mm	**V390641**	80.00	**V390641-V**	86.50
.1300	3.300 mm	.457	**11.60 mm**	**(3x)**	12.28 mm	.68 mm	4 mm	63 mm	**V171897**	43.50	**V171897-V**	50.00
.1300	3.300 mm	.717	**18.20 mm**	**(5x)**	18.88 mm	.68 mm	4 mm	63 mm	**V999845**	80.00	**V999845-V**	86.50
.1338	3.400 mm	.472	**12.00 mm**	**(3x)**	12.70 mm	.70 mm	4 mm	63 mm	**V781405**	43.50	**V781405-V**	50.00
.1338	3.400 mm	.732	**18.60 mm**	**(5x)**	19.30 mm	.70 mm	4 mm	63 mm	**V262808**	80.00	**V262808-V**	86.50
.1377	3.500 mm	.480	**12.20 mm**	**(3x)**	12.92 mm	.72 mm	4 mm	63 mm	**V839259**	43.50	**V839259-V**	50.00
.1377	3.500 mm	.756	**19.20 mm**	**(5x)**	19.92 mm	.72 mm	4 mm	63 mm	**V920406**	80.00	**V920406-V**	86.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.1406 (9/64)	3.571 mm	.488	**12.40 mm**	**(3x)**	13.14 mm	.74 mm	4 mm	63 mm	**V740344**	43.50	**V740344-V**	50.00
.1406 (9/64)	3.571 mm	.772	**19.60 mm**	**(5x)**	20.34 mm	.74 mm	4 mm	63 mm	**V747490**	80.00	**V747490-V**	86.50
.1417	3.600 mm	.496	**12.60 mm**	**(3x)**	13.35 mm	.75 mm	4 mm	63 mm	**V137136**	43.50	**V137136-V**	50.00
.1417	3.600 mm	.780	**19.80 mm**	**(5x)**	20.55 mm	.75 mm	4 mm	63 mm	**V813201**	80.00	**V813201-V**	86.50
.1456	3.700 mm	.512	**13.00 mm**	**(3x)**	13.77 mm	.77 mm	4 mm	63 mm	**V282861**	43.50	**V282861-V**	50.00
.1456	3.700 mm	.803	**20.40 mm**	**(5x)**	21.17 mm	.77 mm	4 mm	63 mm	**V334748**	80.00	**V334748-V**	86.50
.1496	3.800 mm	.520	**13.20 mm**	**(3x)**	13.99 mm	.79 mm	4 mm	63 mm	**V728547**	43.50	**V728547-V**	50.00
.1496	3.800 mm	.819	**20.80 mm**	**(5x)**	21.59 mm	.79 mm	4 mm	63 mm	**V454017**	80.00	**V454017-V**	86.50
.1535	3.900 mm	.535	**13.60 mm**	**(3x)**	14.41 mm	.81 mm	4 mm	63 mm	**V438470**	43.50	**V438470-V**	50.00
.1535	3.900 mm	.843	**21.40 mm**	**(5x)**	22.21 mm	.81 mm	4 mm	63 mm	**V878966**	80.00	**V878966-V**	86.50
.1562 (5/32)	3.968 mm	.543	**13.80 mm**	**(3x)**	14.62 mm	.82 mm	4 mm	63 mm	**V648893**	43.50	**V648893-V**	50.00
.1562 (5/32)	3.968 mm	.858	**21.80 mm**	**(5x)**	22.62 mm	.82 mm	4 mm	63 mm	**V458952**	80.00	**V458952-V**	86.50
.1574	4.000 mm	.551	**14.00 mm**	**(3x)**	14.83 mm	.83 mm	6 mm	63 mm	**V421509**	43.50	**V421509-V**	51.00
.1574	4.000 mm	.866	**22.00 mm**	**(5x)**	22.83 mm	.83 mm	6 mm	75 mm	**V338334**	80.00	**V338334-V**	87.50
.1614	4.100 mm	.567	**14.40 mm**	**(3x)**	15.25 mm	.85 mm	6 mm	63 mm	**V174492**	50.50	**V174492-V**	58.00
.1614	4.100 mm	.890	**22.60 mm**	**(5x)**	23.45 mm	.85 mm	6 mm	75 mm	**V885910**	87.50	**V885910-V**	95.00
.1653	4.200 mm	.583	**14.80 mm**	**(3x)**	15.67 mm	.87 mm	6 mm	63 mm	**V106883**	50.50	**V106883-V**	58.00
.1653	4.200 mm	.913	**23.20 mm**	**(5x)**	24.07 mm	.87 mm	6 mm	75 mm	**V261808**	87.50	**V261808-V**	95.00
.1692	4.300 mm	.591	**15.00 mm**	**(3x)**	15.89 mm	.89 mm	6 mm	63 mm	**V831806**	50.50	**V831806-V**	58.00
.1692	4.300 mm	.929	**23.60 mm**	**(5x)**	24.49 mm	.89 mm	6 mm	75 mm	**V911321**	87.50	**V911321-V**	95.00
.1718 (11/64)	4.365 mm	.598	**15.20 mm**	**(3x)**	16.10 mm	.90 mm	6 mm	63 mm	**V639993**	50.50	**V639993-V**	58.00
.1718 (11/64)	4.365 mm	.945	**24.00 mm**	**(5x)**	24.90 mm	.90 mm	6 mm	75 mm	**V374159**	87.50	**V374159-V**	95.00
.1732	4.400 mm	.606	**15.40 mm**	**(3x)**	16.31 mm	.91 mm	6 mm	63 mm	**V582968**	50.50	**V582968-V**	58.00
.1732	4.400 mm	.953	**24.20 mm**	**(5x)**	25.11 mm	.91 mm	6 mm	75 mm	**V197740**	87.50	**V197740-V**	95.00
.1771	4.500 mm	.622	**15.80 mm**	**(3x)**	16.73 mm	.93 mm	6 mm	63 mm	**V956195**	50.50	**V956195-V**	58.00
.1771	4.500 mm	.976	**24.80 mm**	**(5x)**	25.73 mm	.93 mm	6 mm	75 mm	**V441617**	87.50	**V441617-V**	95.00
.1811	4.600 mm	.630	**16.00 mm**	**(3x)**	16.95 mm	.95 mm	6 mm	63 mm	**V866527**	50.50	**V866527-V**	58.00
.1811	4.600 mm	.992	**25.20 mm**	**(5x)**	26.15 mm	.95 mm	6 mm	75 mm	**V224773**	87.50	**V224773-V**	95.00
.1850	4.700 mm	.646	**16.40 mm**	**(3x)**	17.37 mm	.97 mm	6 mm	63 mm	**V344265**	50.50	**V344265-V**	58.00
.1850	4.700 mm	1.016	**25.80 mm**	**(5x)**	26.77 mm	.97 mm	6 mm	75 mm	**V433090**	87.50	**V433090-V**	95.00
.1875 (3/16)	4.762 mm	.654	**16.60 mm**	**(3x)**	17.59 mm	.99 mm	6 mm	63 mm	**V850660**	50.50	**V850660-V**	58.00
.1875 (3/16)	4.762 mm	1.032	**26.20 mm**	**(5x)**	27.19 mm	.99 mm	6 mm	75 mm	**V771194**	87.50	**V771194-V**	95.00
.1890	4.800 mm	.661	**16.80 mm**	**(3x)**	17.79 mm	.99 mm	6 mm	63 mm	**V568557**	50.50	**V568557-V**	58.00
.1890	4.800 mm	1.039	**26.40 mm**	**(5x)**	27.39 mm	.99 mm	6 mm	75 mm	**V856912**	87.50	**V856912-V**	95.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.1930	4.900 mm	.677	**17.20 mm**	**(3x)**	18.21 mm	1.01 mm	6 mm	63 mm	**V728480**	50.50	**V728480-V**	58.00
.1930	4.900 mm	1.063	**27.00 mm**	**(5x)**	28.01 mm	1.01 mm	6 mm	75 mm	**V367252**	87.50	**V367252-V**	95.00
.1968	5.000 mm	.693	**17.60 mm**	**(3x)**	18.64 mm	1.04 mm	6 mm	63 mm	**V330699**	50.50	**V330699-V**	58.00
.1968	5.000 mm	1.087	**27.60 mm**	**(5x)**	28.64 mm	1.04 mm	6 mm	75 mm	**V234458**	87.50	**V234458-V**	95.00
.2007	5.100 mm	.701	**17.80 mm**	**(3x)**	18.86 mm	1.06 mm	6 mm	63 mm	**V368184**	50.50	**V368184-V**	58.00
.2007	5.100 mm	1.102	**28.00 mm**	**(5x)**	29.06 mm	1.06 mm	6 mm	75 mm	**V224687**	87.50	**V224687-V**	95.00
.2031 (13/64)	5.159 mm	.709	**18.00 mm**	**(3x)**	19.07 mm	1.07 mm	6 mm	63 mm	**V977882**	50.50	**V977882-V**	58.00
.2031 (13/64)	5.159 mm	1.118	**28.40 mm**	**(5x)**	29.47 mm	1.07 mm	6 mm	75 mm	**V420736**	87.50	**V420736-V**	95.00
.2047	5.200 mm	.717	**18.20 mm**	**(3x)**	19.28 mm	1.08 mm	6 mm	63 mm	**V485216**	50.50	**V485216-V**	58.00
.2047	5.200 mm	1.126	**28.60 mm**	**(5x)**	29.68 mm	1.08 mm	6 mm	75 mm	**V357300**	87.50	**V357300-V**	95.00
.2086	5.300 mm	.732	**18.60 mm**	**(3x)**	19.70 mm	1.10 mm	6 mm	63 mm	**V110782**	50.50	**V110782-V**	58.00
.2086	5.300 mm	1.150	**29.20 mm**	**(5x)**	30.30 mm	1.10 mm	6 mm	75 mm	**V727361**	87.50	**V727361-V**	95.00
.2125	5.400 mm	.748	**19.00 mm**	**(3x)**	20.12 mm	1.12 mm	6 mm	63 mm	**V836676**	50.50	**V836676-V**	58.00
.2125	5.400 mm	1.173	**29.80 mm**	**(5x)**	30.92 mm	1.12 mm	6 mm	75 mm	**V834281**	87.50	**V834281-V**	95.00
.2165	5.500 mm	.756	**19.20 mm**	**(3x)**	20.34 mm	1.14 mm	6 mm	63 mm	**V106542**	50.50	**V106542-V**	58.00
.2165	5.500 mm	1.189	**30.20 mm**	**(5x)**	31.34 mm	1.14 mm	6 mm	75 mm	**V492013**	87.50	**V492013-V**	95.00
.2187 (7/32)	5.556 mm	.764	**19.40 mm**	**(3x)**	20.55 mm	1.15 mm	6 mm	63 mm	**V656902**	50.50	**V656902-V**	58.00
.2187 (7/32)	5.556 mm	1.205	**30.60 mm**	**(5x)**	31.75 mm	1.15 mm	6 mm	75 mm	**V700600**	87.50	**V700600-V**	95.00
.2205	5.600 mm	.772	**19.60 mm**	**(3x)**	20.76 mm	1.16 mm	6 mm	63 mm	**V770182**	50.50	**V770182-V**	58.00
.2205	5.600 mm	1.213	**30.80 mm**	**(5x)**	31.96 mm	1.16 mm	6 mm	75 mm	**V896743**	87.50	**V896743-V**	95.00
.2244	5.700 mm	.787	**20.00 mm**	**(3x)**	21.18 mm	1.18 mm	6 mm	63 mm	**V403734**	50.50	**V403734-V**	58.00
.2244	5.700 mm	1.236	**31.40 mm**	**(5x)**	32.58 mm	1.18 mm	6 mm	75 mm	**V770664**	87.50	**V770664-V**	95.00
.2283	5.800 mm	.803	**20.40 mm**	**(3x)**	21.60 mm	1.20 mm	6 mm	63 mm	**V899133**	50.50	**V899133-V**	58.00
.2283	5.800 mm	1.252	**31.80 mm**	**(5x)**	33.00 mm	1.20 mm	6 mm	75 mm	**V380680**	87.50	**V380680-V**	95.00
.2322	5.900 mm	.811	**20.60 mm**	**(3x)**	21.82 mm	1.22 mm	6 mm	63 mm	**V590239**	50.50	**V590239-V**	58.00
.2322	5.900 mm	1.276	**32.40 mm**	**(5x)**	33.62 mm	1.22 mm	6 mm	75 mm	**V537399**	87.50	**V537399-V**	95.00
.2343 (15/64)	5.953 mm	.819	**20.80 mm**	**(3x)**	22.03 mm	1.23 mm	6 mm	63 mm	**V353700**	50.50	**V353700-V**	58.00
.2343 (15/64)	5.953 mm	1.291	**32.80 mm**	**(5x)**	34.03 mm	1.23 mm	6 mm	75 mm	**V430775**	87.50	**V430775-V**	95.00
.2362	6.000 mm	.827	**21.00 mm**	**(3x)**	22.24 mm	1.24 mm	8 mm	75 mm	**V234178**	50.50	**V234178-V**	59.50
.2362	6.000 mm	1.299	**33.00 mm**	**(5x)**	34.24 mm	1.24 mm	8 mm	100 mm	**V927207**	87.50	**V927207-V**	97.50
.2401	6.100 mm	.847	**21.50 mm**	**(3x)**	22.76 mm	1.26 mm	8 mm	75 mm	**V524686**	53.00	**V524686-V**	62.00
.2401	6.100 mm	1.319	**33.50 mm**	**(5x)**	34.76 mm	1.26 mm	8 mm	100 mm	**V699896**	101.50	**V699896-V**	111.50
.2440	6.200 mm	.847	**21.50 mm**	**(3x)**	22.78 mm	1.28 mm	8 mm	75 mm	**V147676**	53.00	**V147676-V**	62.00
.2440	6.200 mm	1.339	**34.00 mm**	**(5x)**	35.28 mm	1.28 mm	8 mm	100 mm	**V973436**	101.50	**V973436-V**	111.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.2480	6.300 mm	.866	**22.00 mm**	**(3x)**	23.30 mm	1.30 mm	8 mm	75 mm	**V627609**	53.00	**V627609-V**	62.00
.2480	6.300 mm	1.358	**34.50 mm**	**(5x)**	35.80 mm	1.30 mm	8 mm	100 mm	**V753195**	101.50	**V753195-V**	111.50
.2500 (1/4)	6.350 mm	.866	**22.00 mm**	**(3x)**	23.32 mm	1.32 mm	8 mm	75 mm	**V463324**	53.00	**V463324-V**	62.00
.2500 (1/4)	6.350 mm	1.378	**35.00 mm**	**(5x)**	36.32 mm	1.32 mm	8 mm	100 mm	**V890966**	101.50	**V890966-V**	111.50
.2520	6.400 mm	.886	**22.50 mm**	**(3x)**	23.83 mm	1.33 mm	8 mm	75 mm	**V470320**	53.00	**V470320-V**	62.00
.2520	6.400 mm	1.378	**35.00 mm**	**(5x)**	36.33 mm	1.33 mm	8 mm	100 mm	**V610421**	101.50	**V610421-V**	111.50
.2559	6.500 mm	.906	**23.00 mm**	**(3x)**	24.35 mm	1.35 mm	8 mm	75 mm	**V904272**	53.00	**V904272-V**	62.00
.2559	6.500 mm	1.417	**36.00 mm**	**(5x)**	37.35 mm	1.35 mm	8 mm	100 mm	**V503831**	101.50	**V503831-V**	111.50
.2598	6.600 mm	.906	**23.00 mm**	**(3x)**	24.37 mm	1.37 mm	8 mm	75 mm	**V591811**	53.00	**V591811-V**	62.00
.2598	6.600 mm	1.437	**36.50 mm**	**(5x)**	37.87 mm	1.37 mm	8 mm	100 mm	**V548894**	101.50	**V548894-V**	111.50
.2638	6.700 mm	.925	**23.50 mm**	**(3x)**	24.89 mm	1.39 mm	8 mm	75 mm	**V863925**	53.00	**V863925-V**	62.00
.2638	6.700 mm	1.457	**37.00 mm**	**(5x)**	38.39 mm	1.39 mm	8 mm	100 mm	**V956352**	101.50	**V956352-V**	111.50
.2656 (17/64)	6.746 mm	.925	**23.50 mm**	**(3x)**	24.90 mm	1.40 mm	8 mm	75 mm	**V230372**	53.00	**V230372-V**	62.00
.2656 (17/64)	6.746 mm	1.457	**37.00 mm**	**(5x)**	38.40 mm	1.40 mm	8 mm	100 mm	**V330745**	101.50	**V330745-V**	111.50
.2677	6.800 mm	.945	**24.00 mm**	**(3x)**	25.41 mm	1.41 mm	8 mm	75 mm	**V586533**	53.00	**V586533-V**	62.00
.2677	6.800 mm	1.476	**37.50 mm**	**(5x)**	38.91 mm	1.41 mm	8 mm	100 mm	**V112067**	101.50	**V112067-V**	111.50
.2717	6.900 mm	.945	**24.00 mm**	**(3x)**	25.43 mm	1.43 mm	8 mm	75 mm	**V585346**	53.00	**V585346-V**	62.00
.2717	6.900 mm	1.496	**38.00 mm**	**(5x)**	39.43 mm	1.43 mm	8 mm	100 mm	**V766452**	101.50	**V766452-V**	111.50
.2756	7.000 mm	.965	**24.50 mm**	**(3x)**	25.95 mm	1.45 mm	8 mm	75 mm	**V793057**	53.00	**V793057-V**	62.00
.2756	7.000 mm	1.516	**38.50 mm**	**(5x)**	39.95 mm	1.45 mm	8 mm	100 mm	**V812884**	101.50	**V812884-V**	111.50
.2795	7.100 mm	.984	**25.00 mm**	**(3x)**	26.47 mm	1.47 mm	8 mm	75 mm	**V971883**	55.00	**V971883-V**	64.00
.2795	7.100 mm	1.535	**39.00 mm**	**(5x)**	40.47 mm	1.47 mm	8 mm	100 mm	**V526212**	103.50	**V526212-V**	113.50
.2812 (9/32)	7.142 mm	.984	**25.00 mm**	**(3x)**	26.48 mm	1.48 mm	8 mm	75 mm	**V745358**	55.00	**V745358-V**	64.00
.2812 (9/32)	7.142 mm	1.555	**39.50 mm**	**(5x)**	40.98 mm	1.48 mm	8 mm	100 mm	**V974925**	103.50	**V974925-V**	113.50
.2834	7.200 mm	.984	**25.00 mm**	**(3x)**	26.49 mm	1.49 mm	8 mm	75 mm	**V318182**	55.00	**V318182-V**	64.00
.2834	7.200 mm	1.555	**39.50 mm**	**(5x)**	40.99 mm	1.49 mm	8 mm	100 mm	**V243742**	103.50	**V243742-V**	113.50
.2874	7.300 mm	1.004	**25.50 mm**	**(3x)**	27.01 mm	1.51 mm	8 mm	75 mm	**V400766**	55.00	**V400766-V**	64.00
.2874	7.300 mm	1.575	**40.00 mm**	**(5x)**	41.51 mm	1.51 mm	8 mm	100 mm	**V340474**	103.50	**V340474-V**	113.50
.2913	7.400 mm	1.024	**26.00 mm**	**(3x)**	27.53 mm	1.53 mm	8 mm	75 mm	**V583325**	55.00	**V583325-V**	64.00
.2913	7.400 mm	1.595	**40.50 mm**	**(5x)**	42.03 mm	1.53 mm	8 mm	100 mm	**V884228**	103.50	**V884228-V**	113.50
.2952	7.500 mm	1.043	**26.50 mm**	**(3x)**	28.05 mm	1.55 mm	8 mm	75 mm	**V833945**	55.00	**V833945-V**	64.00
.2952	7.500 mm	1.634	**41.50 mm**	**(5x)**	43.05 mm	1.55 mm	8 mm	100 mm	**V759862**	103.50	**V759862-V**	113.50
.2969 (19/64)	7.541 mm	1.043	**26.50 mm**	**(3x)**	28.06 mm	1.56 mm	8 mm	75 mm	**V222380**	55.00	**V222380-V**	64.00
.2969 (19/64)	7.541 mm	1.634	**41.50 mm**	**(5x)**	43.06 mm	1.56 mm	8 mm	100 mm	**V440832**	103.50	**V440832-V**	113.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.2992	7.600 mm	1.043	**26.50 mm**	**(3x)**	28.07 mm	1.57 mm	8 mm	75 mm	**V931842**	55.00	**V931842-V**	64.00
.2992	7.600 mm	1.654	**42.00 mm**	**(5x)**	43.57 mm	1.57 mm	8 mm	100 mm	**V883385**	103.50	**V883385-V**	113.50
.3031	7.700 mm	1.063	**27.00 mm**	**(3x)**	28.59 mm	1.59 mm	8 mm	75 mm	**V649826**	55.00	**V649826-V**	64.00
.3031	7.700 mm	1.673	**42.50 mm**	**(5x)**	44.09 mm	1.59 mm	8 mm	100 mm	**V696121**	103.50	**V696121-V**	113.50
.3071	7.800 mm	1.083	**27.50 mm**	**(3x)**	29.12 mm	1.62 mm	8 mm	75 mm	**V402097**	55.00	**V402097-V**	64.00
.3071	7.800 mm	1.693	**43.00 mm**	**(5x)**	44.62 mm	1.62 mm	8 mm	100 mm	**V914982**	103.50	**V914982-V**	113.50
.3110	7.900 mm	1.083	**27.50 mm**	**(3x)**	29.14 mm	1.64 mm	8 mm	75 mm	**V217709**	55.00	**V217709-V**	64.00
.3110	7.900 mm	1.713	**43.50 mm**	**(5x)**	45.14 mm	1.64 mm	8 mm	100 mm	**V960211**	103.50	**V960211-V**	113.50
.3125 (5/16)	7.937 mm	1.102	**28.00 mm**	**(3x)**	29.64 mm	1.64 mm	8 mm	75 mm	**V785367**	55.00	**V785367-V**	64.00
.3125 (5/16)	7.937 mm	1.713	**43.50 mm**	**(5x)**	45.14 mm	1.64 mm	8 mm	100 mm	**V504447**	103.50	**V504447-V**	113.50
.3150	8.000 mm	1.102	**28.00 mm**	**(3x)**	29.66 mm	1.66 mm	10 mm	75 mm	**V899583**	55.00	**V899583-V**	66.00
.3150	8.000 mm	1.732	**44.00 mm**	**(5x)**	45.66 mm	1.66 mm	10 mm	100 mm	**V959977**	103.50	**V959977-V**	115.00
.3189	8.100 mm	1.122	**28.50 mm**	**(3x)**	30.18 mm	1.68 mm	10 mm	75 mm	**V926444**	62.50	**V926444-V**	73.50
.3189	8.100 mm	1.752	**44.50 mm**	**(5x)**	46.18 mm	1.68 mm	10 mm	100 mm	**V759625**	122.00	**V759625-V**	133.50
.3228	8.200 mm	1.122	**28.50 mm**	**(3x)**	30.20 mm	1.70 mm	10 mm	75 mm	**V724837**	62.50	**V724837-V**	73.50
.3228	8.200 mm	1.772	**45.00 mm**	**(5x)**	46.70 mm	1.70 mm	10 mm	100 mm	**V873208**	122.00	**V873208-V**	133.50
.3268	8.300 mm	1.142	**29.00 mm**	**(3x)**	30.72 mm	1.72 mm	10 mm	75 mm	**V555652**	62.50	**V555652-V**	73.50
.3268	8.300 mm	1.791	**45.50 mm**	**(5x)**	47.22 mm	1.72 mm	10 mm	100 mm	**V573287**	122.00	**V573287-V**	133.50
.3281 (21/64)	8.333 mm	1.142	**29.00 mm**	**(3x)**	30.73 mm	1.73 mm	10 mm	75 mm	**V733277**	62.50	**V733277-V**	73.50
.3281 (21/64)	8.333 mm	1.811	**46.00 mm**	**(5x)**	47.73 mm	1.73 mm	10 mm	100 mm	**V919579**	122.00	**V919579-V**	133.50
.3307	8.400 mm	1.161	**29.50 mm**	**(3x)**	31.24 mm	1.74 mm	10 mm	75 mm	**V167766**	62.50	**V167766-V**	73.50
.3307	8.400 mm	1.811	**46.00 mm**	**(5x)**	47.74 mm	1.74 mm	10 mm	100 mm	**V633981**	122.00	**V633981-V**	133.50
.3346	8.500 mm	1.181	**30.00 mm**	**(3x)**	31.76 mm	1.76 mm	10 mm	75 mm	**V408664**	62.50	**V408664-V**	73.50
.3346	8.500 mm	1.850	**47.00 mm**	**(5x)**	48.76 mm	1.76 mm	10 mm	100 mm	**V861150**	122.00	**V861150-V**	133.50
.3386	8.600 mm	1.181	**30.00 mm**	**(3x)**	31.78 mm	1.78 mm	10 mm	75 mm	**V390096**	62.50	**V390096-V**	73.50
.3386	8.600 mm	1.870	**47.50 mm**	**(5x)**	49.28 mm	1.78 mm	10 mm	100 mm	**V844326**	122.00	**V844326-V**	133.50
.3425	8.700 mm	1.201	**30.50 mm**	**(3x)**	32.30 mm	1.80 mm	10 mm	75 mm	**V151969**	62.50	**V151969-V**	73.50
.3425	8.700 mm	1.890	**48.00 mm**	**(5x)**	49.80 mm	1.80 mm	10 mm	100 mm	**V879893**	122.00	**V879893-V**	133.50
.3438 (11/32)	8.732 mm	1.201	**30.50 mm**	**(3x)**	32.31 mm	1.81 mm	10 mm	75 mm	**V104671**	62.50	**V104671-V**	73.50
.3438 (11/32)	8.732 mm	1.890	**48.00 mm**	**(5x)**	49.81 mm	1.81 mm	10 mm	100 mm	**V335452**	122.00	**V335452-V**	133.50
.3465	8.800 mm	1.221	**31.00 mm**	**(3x)**	32.82 mm	1.82 mm	10 mm	75 mm	**V891293**	62.50	**V891293-V**	73.50
.3465	8.800 mm	1.909	**48.50 mm**	**(5x)**	50.32 mm	1.82 mm	10 mm	100 mm	**V260828**	122.00	**V260828-V**	133.50
.3504	8.900 mm	1.221	**31.00 mm**	**(3x)**	32.84 mm	1.84 mm	10 mm	75 mm	**V365922**	62.50	**V365922-V**	73.50
.3504	8.900 mm	1.929	**49.00 mm**	**(5x)**	50.84 mm	1.84 mm	10 mm	100 mm	**V781535**	122.00	**V781535-V**	133.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.3543	9.000 mm	1.240	**31.50 mm**	(3x)	33.36 mm	1.86 mm	10 mm	75 mm	**V386241**	62.50	**V386241-V**	73.50
.3543	9.000 mm	1.949	**49.50 mm**	(5x)	51.36 mm	1.86 mm	10 mm	100 mm	**V656849**	122.00	**V656849-V**	133.50
.3583	9.100 mm	1.260	**32.00 mm**	(3x)	33.88 mm	1.88 mm	10 mm	75 mm	**V637527**	82.00	**V637527-V**	93.00
.3583	9.100 mm	1.969	**50.00 mm**	(5x)	51.88 mm	1.88 mm	10 mm	100 mm	**V134756**	136.50	**V134756-V**	148.00
.3594 (23/64)	9.128 mm	1.260	**32.00 mm**	(3x)	33.89 mm	1.89 mm	10 mm	75 mm	**V324647**	82.00	**V324647-V**	93.00
.3594 (23/64)	9.128 mm	1.969	**50.00 mm**	(5x)	51.89 mm	1.89 mm	10 mm	100 mm	**V928900**	136.50	**V928900-V**	148.00
.3622	9.200 mm	1.260	**32.00 mm**	(3x)	33.91 mm	1.91 mm	10 mm	75 mm	**V332586**	82.00	**V332586-V**	93.00
.3622	9.200 mm	1.988	**50.50 mm**	(5x)	52.41 mm	1.91 mm	10 mm	100 mm	**V326648**	136.50	**V326648-V**	148.00
.3661	9.300 mm	1.280	**32.50 mm**	(3x)	34.43 mm	1.93 mm	10 mm	75 mm	**V589859**	82.00	**V589859-V**	93.00
.3661	9.300 mm	2.008	**51.00 mm**	(5x)	52.93 mm	1.93 mm	10 mm	100 mm	**V975106**	136.50	**V975106-V**	148.00
.3701	9.400 mm	1.299	**33.00 mm**	(3x)	34.95 mm	1.95 mm	10 mm	75 mm	**V656422**	82.00	**V656422-V**	93.00
.3701	9.400 mm	2.028	**51.50 mm**	(5x)	53.45 mm	1.95 mm	10 mm	100 mm	**V807457**	136.50	**V807457-V**	148.00
.3740	9.500 mm	1.319	**33.50 mm**	(3x)	35.47 mm	1.97 mm	10 mm	75 mm	**V306233**	82.00	**V306233-V**	93.00
.3740	9.500 mm	2.067	**52.50 mm**	(5x)	54.47 mm	1.97 mm	10 mm	100 mm	**V983594**	136.50	**V983594-V**	148.00
.3750 (3/8)	9.525 mm	1.319	**33.50 mm**	(3x)	35.47 mm	1.97 mm	10 mm	75 mm	**V893492**	82.00	**V893492-V**	93.00
.3750 (3/8)	9.525 mm	2.067	**52.50 mm**	(5x)	54.47 mm	1.97 mm	10 mm	100 mm	**V937306**	136.50	**V937306-V**	148.00
.3780	9.600 mm	1.319	**33.50 mm**	(3x)	35.49 mm	1.99 mm	10 mm	75 mm	**V883648**	82.00	**V883648-V**	93.00
.3780	9.600 mm	2.087	**53.00 mm**	(5x)	54.99 mm	1.99 mm	10 mm	100 mm	**V796500**	136.50	**V796500-V**	148.00
.3819	9.700 mm	1.339	**34.00 mm**	(3x)	36.01 mm	2.01 mm	10 mm	75 mm	**V695542**	82.00	**V695542-V**	93.00
.3819	9.700 mm	2.106	**53.50 mm**	(5x)	55.51 mm	2.01 mm	10 mm	100 mm	**V247210**	136.50	**V247210-V**	148.00
.3858	9.800 mm	1.358	**34.50 mm**	(3x)	36.53 mm	2.03 mm	10 mm	75 mm	**V676169**	82.00	**V676169-V**	93.00
.3858	9.800 mm	2.126	**54.00 mm**	(5x)	56.03 mm	2.03 mm	10 mm	100 mm	**V823528**	136.50	**V823528-V**	148.00
.3898	9.900 mm	1.358	**34.50 mm**	(3x)	36.55 mm	2.05 mm	10 mm	75 mm	**V263386**	82.00	**V263386-V**	93.00
.3898	9.900 mm	2.146	**54.50 mm**	(5x)	56.55 mm	2.05 mm	10 mm	100 mm	**V879509**	136.50	**V879509-V**	148.00
.3906 (25/64)	9.921 mm	1.358	**34.50 mm**	(3x)	36.55 mm	2.05 mm	10 mm	75 mm	**V405503**	82.00	**V405503-V**	93.00
.3906 (25/64)	9.921 mm	2.146	**54.50 mm**	(5x)	56.55 mm	2.05 mm	10 mm	100 mm	**V287196**	136.50	**V287196-V**	148.00
.3937	10.000 mm	1.378	**35.00 mm**	(3x)	37.07 mm	2.07 mm	12 mm	100 mm	**V532196**	82.00	**V532196-V**	98.00
.3937	10.000 mm	2.165	**55.00 mm**	(5x)	57.07 mm	2.07 mm	12 mm	125 mm	**V856596**	136.50	**V856596-V**	153.50
.3976	10.100 mm	1.398	**35.50 mm**	(3x)	37.59 mm	2.09 mm	12 mm	100 mm	**V621639**	105.60	**V621639-V**	121.50
.3976	10.100 mm	2.185	**55.50 mm**	(5x)	57.59 mm	2.09 mm	12 mm	125 mm	**V848057**	204.60	**V848057-V**	221.50
.4016	10.200 mm	1.398	**35.50 mm**	(3x)	37.61 mm	2.11 mm	12 mm	100 mm	**V641835**	105.60	**V641835-V**	121.50
.4016	10.200 mm	2.205	**56.00 mm**	(5x)	58.11 mm	2.11 mm	12 mm	125 mm	**V210101**	204.60	**V210101-V**	221.50
.4055	10.300 mm	1.417	**36.00 mm**	(3x)	38.13 mm	2.13 mm	12 mm	100 mm	**V589355**	105.60	**V589355-V**	121.50
.4055	10.300 mm	2.224	**56.50 mm**	(5x)	58.63 mm	2.13 mm	12 mm	125 mm	**V333787**	204.60	**V333787-V**	221.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.4062 (13/32)	10.317 mm	1.417	**36.00 mm**	**(3x)**	38.14 mm	2.14 mm	12 mm	100 mm	**V576080**	105.60	**V576080-V**	121.50
.4062 (13/32)	10.317 mm	2.224	**56.50 mm**	**(5x)**	58.64 mm	2.14 mm	12 mm	125 mm	**V227073**	204.60	**V227073-V**	221.50
.4094	10.400 mm	1.437	**36.50 mm**	**(3x)**	38.65 mm	2.15 mm	12 mm	100 mm	**V708410**	105.60	**V708410-V**	121.50
.4094	10.400 mm	2.244	**57.00 mm**	**(5x)**	59.15 mm	2.15 mm	12 mm	125 mm	**V195280**	204.60	**V195280-V**	221.50
.4134	10.500 mm	1.457	**37.00 mm**	**(3x)**	39.17 mm	2.17 mm	12 mm	100 mm	**V879946**	105.60	**V879946-V**	121.50
.4134	10.500 mm	2.284	**58.00 mm**	**(5x)**	60.17 mm	2.17 mm	12 mm	125 mm	**V496598**	204.60	**V496598-V**	221.50
.4173	10.600 mm	1.457	**37.00 mm**	**(3x)**	39.20 mm	2.20 mm	12 mm	100 mm	**V455218**	105.60	**V455218-V**	121.50
.4173	10.600 mm	2.303	**58.50 mm**	**(5x)**	60.70 mm	2.20 mm	12 mm	125 mm	**V452314**	204.60	**V452314-V**	221.50
.4213	10.700 mm	1.476	**37.50 mm**	**(3x)**	39.72 mm	2.22 mm	12 mm	100 mm	**V155404**	105.60	**V155404-V**	121.50
.4213	10.700 mm	2.323	**59.00 mm**	**(5x)**	61.22 mm	2.22 mm	12 mm	125 mm	**V634560**	204.60	**V634560-V**	221.50
.4219 (27/64)	10.716 mm	1.476	**37.50 mm**	**(3x)**	39.72 mm	2.22 mm	12 mm	100 mm	**V826638**	105.60	**V826638-V**	121.50
.4219 (27/64)	10.716 mm	2.323	**59.00 mm**	**(5x)**	61.22 mm	2.22 mm	12 mm	125 mm	**V814056**	204.60	**V814056-V**	221.50
.4252	10.800 mm	1.496	**38.00 mm**	**(3x)**	40.24 mm	2.24 mm	12 mm	100 mm	**V213641**	105.60	**V213641-V**	121.50
.4252	10.800 mm	2.343	**59.50 mm**	**(5x)**	61.74 mm	2.24 mm	12 mm	125 mm	**V455956**	204.60	**V455956-V**	221.50
.4291	10.900 mm	1.496	**38.00 mm**	**(3x)**	40.26 mm	2.26 mm	12 mm	100 mm	**V681558**	105.60	**V681558-V**	121.50
.4291	10.900 mm	2.362	**60.00 mm**	**(5x)**	62.26 mm	2.26 mm	12 mm	125 mm	**V872776**	204.60	**V872776-V**	221.50
.4331	11.000 mm	1.516	**38.50 mm**	**(3x)**	40.78 mm	2.28 mm	12 mm	100 mm	**V486441**	105.60	**V486441-V**	121.50
.4331	11.000 mm	2.382	**60.50 mm**	**(5x)**	62.78 mm	2.28 mm	12 mm	125 mm	**V840142**	204.60	**V840142-V**	221.50
.4370	11.100 mm	1.535	**39.00 mm**	**(3x)**	41.30 mm	2.30 mm	12 mm	100 mm	**V569821**	115.00	**V569821-V**	131.00
.4370	11.100 mm	2.402	**61.00 mm**	**(5x)**	63.30 mm	2.30 mm	12 mm	125 mm	**V786789**	210.00	**V786789-V**	227.00
.4375 (7/16)	11.112 mm	1.535	**39.00 mm**	**(3x)**	41.30 mm	2.30 mm	12 mm	100 mm	**V194265**	115.00	**V194265-V**	131.00
.4375 (7/16)	11.112 mm	2.402	**61.00 mm**	**(5x)**	63.30 mm	2.30 mm	12 mm	125 mm	**V266796**	210.00	**V266796-V**	227.00
.4409	11.200 mm	1.535	**39.00 mm**	**(3x)**	41.32 mm	2.32 mm	12 mm	100 mm	**V800667**	115.00	**V800667-V**	131.00
.4409	11.200 mm	2.421	**61.50 mm**	**(5x)**	63.82 mm	2.32 mm	12 mm	125 mm	**V503159**	210.00	**V503159-V**	227.00
.4449	11.300 mm	1.555	**39.50 mm**	**(3x)**	41.84 mm	2.34 mm	12 mm	100 mm	**V309259**	115.00	**V309259-V**	131.00
.4449	11.300 mm	2.441	**62.00 mm**	**(5x)**	64.34 mm	2.34 mm	12 mm	125 mm	**V346861**	210.00	**V346861-V**	227.00
.4488	11.400 mm	1.575	**40.00 mm**	**(3x)**	42.36 mm	2.36 mm	12 mm	100 mm	**V434511**	115.00	**V434511-V**	131.00
.4488	11.400 mm	2.461	**62.50 mm**	**(5x)**	64.86 mm	2.36 mm	12 mm	125 mm	**V662862**	210.00	**V662862-V**	227.00
.4527	11.500 mm	1.595	**40.50 mm**	**(3x)**	42.88 mm	2.38 mm	12 mm	100 mm	**V848030**	115.00	**V848030-V**	131.00
.4527	11.500 mm	2.500	**63.50 mm**	**(5x)**	65.88 mm	2.38 mm	12 mm	125 mm	**V786485**	210.00	**V786485-V**	227.00
.4531 (29/64)	11.508 mm	1.595	**40.50 mm**	**(3x)**	42.88 mm	2.38 mm	12 mm	100 mm	**V293298**	115.00	**V293298-V**	131.00
.4531 (29/64)	11.508 mm	2.500	**63.50 mm**	**(5x)**	65.88 mm	2.38 mm	12 mm	125 mm	**V128189**	210.00	**V128189-V**	227.00
.4567	11.600 mm	1.595	**40.50 mm**	**(3x)**	42.90 mm	2.40 mm	12 mm	100 mm	**V713188**	115.00	**V713188-V**	131.00
.4567	11.600 mm	2.520	**64.00 mm**	**(5x)**	66.40 mm	2.40 mm	12 mm	125 mm	**V314182**	210.00	**V314182-V**	227.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.4606	11.700 mm	1.614	**41.00 mm**	**(3x)**	43.42 mm	2.42 mm	12 mm	100 mm	**V136399**	115.00	**V136399-V**	131.00
.4606	11.700 mm	2.539	**64.50 mm**	**(5x)**	66.92 mm	2.42 mm	12 mm	125 mm	**V357863**	210.00	**V357863-V**	227.00
.4646	11.800 mm	1.634	**41.50 mm**	**(3x)**	43.94 mm	2.44 mm	12 mm	100 mm	**V891844**	115.00	**V891844-V**	131.00
.4646	11.800 mm	2.559	**65.00 mm**	**(5x)**	67.44 mm	2.44 mm	12 mm	125 mm	**V101325**	210.00	**V101325-V**	227.00
.4685	11.900 mm	1.634	**41.50 mm**	**(3x)**	43.96 mm	2.46 mm	12 mm	100 mm	**V393491**	115.00	**V393491-V**	131.00
.4685	11.900 mm	2.579	**65.50 mm**	**(5x)**	67.96 mm	2.46 mm	12 mm	125 mm	**V470839**	210.00	**V470839-V**	227.00
.4688 (15/32)	11.907 mm	1.634	**41.50 mm**	**(3x)**	43.97 mm	2.47 mm	12 mm	100 mm	**V477349**	115.00	**V477349-V**	131.00
.4688 (15/32)	11.907 mm	2.579	**65.50 mm**	**(5x)**	67.97 mm	2.47 mm	12 mm	125 mm	**V910118**	210.00	**V910118-V**	227.00
.4724	12.000 mm	1.654	**42.00 mm**	**(3x)**	44.49 mm	2.49 mm	14 mm	100 mm	**V890909**	115.00	**V890909-V**	133.50
.4724	12.000 mm	2.598	**66.00 mm**	**(5x)**	68.49 mm	2.49 mm	14 mm	125 mm	**V660828**	210.00	**V660828-V**	229.50
.4764	12.100 mm	1.673	**42.50 mm**	**(3x)**	45.01 mm	2.51 mm	14 mm	100 mm	**V634940**	151.50	**V634940-V**	170.00
.4764	12.100 mm	2.618	**66.50 mm**	**(5x)**	69.01 mm	2.51 mm	14 mm	125 mm	**V932711**	263.00	**V932711-V**	282.50
.4803	12.200 mm	1.673	**42.50 mm**	**(3x)**	45.03 mm	2.53 mm	14 mm	100 mm	**V905748**	151.50	**V905748-V**	170.00
.4803	12.200 mm	2.638	**67.00 mm**	**(5x)**	69.53 mm	2.53 mm	14 mm	125 mm	**V781595**	263.00	**V781595-V**	282.50
.4843	12.300 mm	1.693	**43.00 mm**	**(3x)**	45.55 mm	2.55 mm	14 mm	100 mm	**V170687**	151.50	**V170687-V**	170.00
.4843	12.300 mm	2.658	**67.50 mm**	**(5x)**	70.05 mm	2.55 mm	14 mm	125 mm	**V699007**	263.00	**V699007-V**	282.50
.4882 (31/64)	12.400 mm	1.713	**43.50 mm**	**(3x)**	46.07 mm	2.57 mm	14 mm	100 mm	**V359843**	151.50	**V359843-V**	170.00
.4882 (31/64)	12.400 mm	2.677	**68.00 mm**	**(5x)**	70.57 mm	2.57 mm	14 mm	125 mm	**V692988**	263.00	**V692988-V**	282.50
.4921	12.500 mm	1.732	**44.00 mm**	**(3x)**	46.59 mm	2.59 mm	14 mm	100 mm	**V512726**	151.50	**V512726-V**	170.00
.4921	12.500 mm	2.717	**69.00 mm**	**(5x)**	71.59 mm	2.59 mm	14 mm	125 mm	**V684136**	263.00	**V684136-V**	282.50
.4961	12.600 mm	1.732	**44.00 mm**	**(3x)**	46.61 mm	2.61 mm	14 mm	100 mm	**V622722**	165.20	**V622722-V**	183.50
.4961	12.600 mm	2.736	**69.50 mm**	**(5x)**	72.11 mm	2.61 mm	14 mm	125 mm	**V951870**	263.00	**V951870-V**	282.50
.5000 (1/2)	12.700 mm	1.752	**44.50 mm**	**(3x)**	47.13 mm	2.63 mm	14 mm	100 mm	**V503316**	165.20	**V503316-V**	183.50
.5000 (1/2)	12.700 mm	2.756	**70.00 mm**	**(5x)**	72.63 mm	2.63 mm	14 mm	125 mm	**V805106**	263.00	**V805106-V**	282.50

* For h6 and h8 tolerances, see page 8.

Tech Tip

If your machine does not have coolant-though capabilities, opt for a high performance solid carbide drill, to ensure your drill will **last longer, run faster, and hold true position** in 3x and 5x applications.

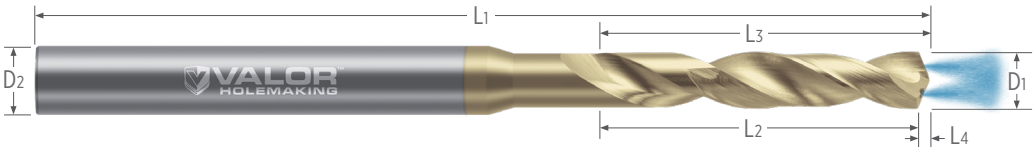
High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through

Point geometry designed to minimize burrs

Unmatched Precision in 6061 Aluminum Coolant-Through Drilling

- Optimized for best-in-class performance in 6061 Aluminum with superior performance in Aluminum and Aluminum Alloys
- Provides excellent performance in other Non-Ferrous Alloys
- Coolant-through channels further enhance chip evacuation
- Geometry is designed to provide minimal entry and exit burrs
- Engineered cylindrical margin design ensures stability and improved performance
- Pre and post polish process delivers reduced friction and ensures outstanding chip management
- 135° point angle with 4-facet geometry for improved self-centering
- h6 shank tolerance for high precision tool holders
- Proprietary Val-Max V coating delivers outstanding performance in Aluminum Alloys and other Non-Ferrous Alloys
- Solid carbide



Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.0625 (1/16)	1.587 mm	.343	**8.70 mm**	**(5x)**	9.03 mm	.33 mm	3 mm	63 mm	**V995092**	95.50	**V995092-V**	101.00
.0625 (1/16)	1.587 mm	.532	**13.50 mm**	**(8x)**	13.83 mm	.33 mm	3 mm	63 mm	**V484828**	162.50	**V484828-V**	168.00
.0630	1.600 mm	.347	**8.80 mm**	**(5x)**	9.13 mm	.33 mm	3 mm	63 mm	**V501534**	95.50	**V501534-V**	101.00
.0630	1.600 mm	.535	**13.60 mm**	**(8x)**	13.93 mm	.33 mm	3 mm	63 mm	**V680349**	162.50	**V680349-V**	168.00
.0669	1.700 mm	.366	**9.30 mm**	**(5x)**	9.65 mm	.35 mm	3 mm	63 mm	**V605780**	95.50	**V605780-V**	101.00
.0669	1.700 mm	.567	**14.40 mm**	**(8x)**	14.75 mm	.35 mm	3 mm	63 mm	**V910907**	162.50	**V910907-V**	168.00
.0708	1.800 mm	.390	**9.90 mm**	**(5x)**	10.27 mm	.37 mm	3 mm	63 mm	**V322492**	95.50	**V322492-V**	101.00
.0708	1.800 mm	.602	**15.30 mm**	**(8x)**	15.67 mm	.37 mm	3 mm	63 mm	**V882014**	162.50	**V882014-V**	168.00
.0748	1.900 mm	.409	**10.40 mm**	**(5x)**	10.79 mm	.39 mm	3 mm	63 mm	**V531576**	95.50	**V531576-V**	101.00
.0748	1.900 mm	.634	**16.10 mm**	**(8x)**	16.49 mm	.39 mm	3 mm	63 mm	**V421746**	162.50	**V421746-V**	168.00
.0781 (5/64)	1.984 mm	.429	**10.90 mm**	**(5x)**	11.31 mm	.41 mm	3 mm	63 mm	**V658747**	95.50	**V658747-V**	101.00
.0781 (5/64)	1.984 mm	.665	**16.90 mm**	**(8x)**	17.31 mm	.41 mm	3 mm	63 mm	**V880813**	162.50	**V880813-V**	168.00
.0787	2.000 mm	.433	**11.00 mm**	**(5x)**	11.41 mm	.41 mm	3 mm	63 mm	**V420395**	95.50	**V420395-V**	101.00
.0787	2.000 mm	.669	**17.00 mm**	**(8x)**	17.41 mm	.41 mm	3 mm	63 mm	**V492205**	162.50	**V492205-V**	168.00

* For h6 and h8 tolerances, see page 8.

continued on next page

Stocked in 5x and 8x hole depths

High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

continued from previous page

Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.0826	2.100 mm	.457	**11.60 mm**	(5x)	12.03 mm	.43 mm	3 mm	63 mm	**V260199**	95.50	**V260199-V**	101.00
.0826	2.100 mm	.705	**17.90 mm**	(8x)	18.33 mm	.43 mm	3 mm	63 mm	**V390543**	162.50	**V390543-V**	168.00
.0866	2.200 mm	.476	**12.10 mm**	(5x)	12.56 mm	.46 mm	3 mm	63 mm	**V507605**	95.50	**V507605-V**	101.00
.0866	2.200 mm	.736	**18.70 mm**	(8x)	19.16 mm	.46 mm	3 mm	63 mm	**V841569**	162.50	**V841569-V**	168.00
.0905	2.300 mm	.496	**12.60 mm**	(5x)	13.08 mm	.48 mm	3 mm	63 mm	**V303320**	95.50	**V303320-V**	101.00
.0905	2.300 mm	.768	**19.50 mm**	(8x)	19.98 mm	.48 mm	3 mm	63 mm	**V664000**	162.50	**V664000-V**	168.00
.0937 (3/32)	2.381 mm	.516	**13.10 mm**	(5x)	13.59 mm	.49 mm	3 mm	63 mm	**V626473**	95.50	**V626473-V**	101.00
.0937 (3/32)	2.381 mm	.795	**20.20 mm**	(8x)	20.69 mm	.49 mm	3 mm	63 mm	**V773519**	162.50	**V773519-V**	168.00
.0944	2.400 mm	.520	**13.20 mm**	(5x)	13.70 mm	.50 mm	3 mm	63 mm	**V199489**	95.50	**V199489-V**	101.00
.0944	2.400 mm	.803	**20.40 mm**	(8x)	20.90 mm	.50 mm	3 mm	63 mm	**V234473**	162.50	**V234473-V**	168.00
.0984	2.500 mm	.543	**13.80 mm**	(5x)	14.32 mm	.52 mm	3 mm	63 mm	**V302724**	95.50	**V302724-V**	101.00
.0984	2.500 mm	.839	**21.30 mm**	(8x)	21.82 mm	.52 mm	3 mm	63 mm	**V755519**	162.50	**V755519-V**	168.00
.1023	2.600 mm	.563	**14.30 mm**	(5x)	14.84 mm	.54 mm	3 mm	63 mm	**V520958**	95.50	**V520958-V**	101.00
.1023	2.600 mm	.870	**22.10 mm**	(8x)	22.64 mm	.54 mm	3 mm	63 mm	**V492168**	162.50	**V492168-V**	168.00
.1062	2.700 mm	.587	**14.90 mm**	(5x)	15.46 mm	.56 mm	3 mm	63 mm	**V527387**	95.50	**V527387-V**	101.00
.1062	2.700 mm	.906	**23.00 mm**	(8x)	23.56 mm	.56 mm	3 mm	63 mm	**V196896**	162.50	**V196896-V**	168.00
.1093 (7/64)	2.778 mm	.602	**15.30 mm**	(5x)	15.88 mm	.58 mm	3 mm	63 mm	**V278759**	95.50	**V278759-V**	101.00
.1093 (7/64)	2.778 mm	.929	**23.60 mm**	(8x)	24.18 mm	.58 mm	3 mm	63 mm	**V618198**	162.50	**V618198-V**	168.00
.1102	2.800 mm	.606	**15.40 mm**	(5x)	15.98 mm	.58 mm	3 mm	63 mm	**V730812**	95.50	**V730812-V**	101.00
.1102	2.800 mm	.937	**23.80 mm**	(8x)	24.38 mm	.58 mm	3 mm	63 mm	**V963101**	162.50	**V963101-V**	168.00
.1141	2.900 mm	.626	**15.90 mm**	(5x)	16.50 mm	.60 mm	3 mm	63 mm	**V882240**	95.50	**V882240-V**	101.00
.1141	2.900 mm	.969	**24.60 mm**	(8x)	25.20 mm	.60 mm	3 mm	63 mm	**V385580**	162.50	**V385580-V**	168.00
.1181	3.000 mm	.654	**16.60 mm**	(5x)	17.22 mm	.62 mm	4 mm	63 mm	**V187918**	95.50	**V187918-V**	102.00
.1181	3.000 mm	1.008	**25.60 mm**	(8x)	26.22 mm	.62 mm	4 mm	75 mm	**V860963**	162.50	**V860963-V**	169.00
.1220	3.100 mm	.669	**17.00 mm**	(5x)	17.64 mm	.64 mm	4 mm	63 mm	**V443746**	95.50	**V443746-V**	102.00
.1220	3.100 mm	1.039	**26.40 mm**	(8x)	27.04 mm	.64 mm	4 mm	75 mm	**V577751**	162.50	**V577751-V**	169.00
.1250 (1/8)	3.175 mm	.685	**17.40 mm**	(5x)	18.06 mm	.66 mm	4 mm	63 mm	**V877822**	95.50	**V877822-V**	102.00
.1250 (1/8)	3.175 mm	1.063	**27.00 mm**	(8x)	27.66 mm	.66 mm	4 mm	75 mm	**V846347**	162.50	**V846347-V**	169.00
.1260	3.200 mm	.693	**17.60 mm**	(5x)	18.26 mm	.66 mm	4 mm	63 mm	**V527462**	95.50	**V527462-V**	102.00
.1260	3.200 mm	1.071	**27.20 mm**	(8x)	27.86 mm	.66 mm	4 mm	75 mm	**V478157**	162.50	**V478157-V**	169.00
.1300	3.300 mm	.717	**18.20 mm**	(5x)	18.88 mm	.68 mm	4 mm	63 mm	**V584441**	95.50	**V584441-V**	102.00
.1300	3.300 mm	1.102	**28.00 mm**	(8x)	28.68 mm	.68 mm	4 mm	75 mm	**V828022**	162.50	**V828022-V**	169.00
.1338	3.400 mm	.732	**18.60 mm**	(5x)	19.30 mm	.70 mm	4 mm	63 mm	**V837035**	95.50	**V837035-V**	102.00
.1338	3.400 mm	1.134	**28.80 mm**	(8x)	29.50 mm	.70 mm	4 mm	75 mm	**V915819**	162.50	**V915819-V**	169.00
.1377	3.500 mm	.756	**19.20 mm**	(5x)	19.92 mm	.72 mm	4 mm	63 mm	**V357695**	95.50	**V357695-V**	102.00
.1377	3.500 mm	1.173	**29.80 mm**	(8x)	30.52 mm	.72 mm	4 mm	75 mm	**V261340**	162.50	**V261340-V**	169.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

continued from previous page

Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.1406 (9/64)	3.571 mm	.772	**19.60 mm**	**(5x)**	20.34 mm	.74 mm	4 mm	63 mm	**V767730**	95.50	**V767730-V**	102.00
.1406 (9/64)	3.571 mm	1.197	**30.40 mm**	**(8x)**	31.14 mm	.74 mm	4 mm	75 mm	**V333089**	162.50	**V333089-V**	169.00
.1417	3.600 mm	.780	**19.80 mm**	**(5x)**	20.55 mm	.75 mm	4 mm	63 mm	**V139840**	95.50	**V139840-V**	102.00
.1417	3.600 mm	1.205	**30.60 mm**	**(8x)**	31.35 mm	.75 mm	4 mm	75 mm	**V241917**	162.50	**V241917-V**	169.00
.1456	3.700 mm	.803	**20.40 mm**	**(5x)**	21.17 mm	.77 mm	4 mm	63 mm	**V441225**	95.50	**V441225-V**	102.00
.1456	3.700 mm	1.236	**31.40 mm**	**(8x)**	32.17 mm	.77 mm	4 mm	75 mm	**V869984**	162.50	**V869984-V**	169.00
.1496	3.800 mm	.819	**20.80 mm**	**(5x)**	21.59 mm	.79 mm	4 mm	63 mm	**V818024**	95.50	**V818024-V**	102.00
.1496	3.800 mm	1.268	**32.20 mm**	**(8x)**	32.99 mm	.79 mm	4 mm	75 mm	**V756236**	162.50	**V756236-V**	169.00
.1535	3.900 mm	.843	**21.40 mm**	**(5x)**	22.21 mm	.81 mm	4 mm	63 mm	**V429888**	95.50	**V429888-V**	102.00
.1535	3.900 mm	1.307	**33.20 mm**	**(8x)**	34.01 mm	.81 mm	4 mm	75 mm	**V832803**	162.50	**V832803-V**	169.00
.1562 (5/32)	3.968 mm	.858	**21.80 mm**	**(5x)**	22.62 mm	.82 mm	4 mm	63 mm	**V205668**	95.50	**V205668-V**	102.00
.1562 (5/32)	3.968 mm	1.331	**33.80 mm**	**(8x)**	34.62 mm	.82 mm	4 mm	75 mm	**V576052**	162.50	**V576052-V**	169.00
.1574	4.000 mm	.866	**22.00 mm**	**(5x)**	22.83 mm	.83 mm	6 mm	75 mm	**V131303**	99.50	**V131303-V**	107.00
.1574	4.000 mm	1.339	**34.00 mm**	**(8x)**	34.83 mm	.83 mm	6 mm	100 mm	**V305691**	162.50	**V305691-V**	170.50
.1614	4.100 mm	.890	**22.60 mm**	**(5x)**	23.45 mm	.85 mm	6 mm	75 mm	**V679258**	99.50	**V679258-V**	107.00
.1614	4.100 mm	1.370	**34.80 mm**	**(8x)**	35.65 mm	.85 mm	6 mm	100 mm	**V557129**	162.50	**V557129-V**	170.50
.1653	4.200 mm	.913	**23.20 mm**	**(5x)**	24.07 mm	.87 mm	6 mm	75 mm	**V803894**	99.50	**V803894-V**	107.00
.1653	4.200 mm	1.409	**35.80 mm**	**(8x)**	36.67 mm	.87 mm	6 mm	100 mm	**V752243**	162.50	**V752243-V**	170.50
.1692	4.300 mm	.929	**23.60 mm**	**(5x)**	24.49 mm	.89 mm	6 mm	75 mm	**V223762**	99.50	**V223762-V**	107.00
.1692	4.300 mm	1.441	**36.60 mm**	**(8x)**	37.49 mm	.89 mm	6 mm	100 mm	**V775572**	162.50	**V775572-V**	170.50
.1718 (11/64)	4.365 mm	.945	**24.00 mm**	**(5x)**	24.90 mm	.90 mm	6 mm	75 mm	**V639751**	99.50	**V639751-V**	107.00
.1718 (11/64)	4.365 mm	1.465	**37.20 mm**	**(8x)**	38.10 mm	.90 mm	6 mm	100 mm	**V849166**	162.50	**V849166-V**	170.50
.1732	4.400 mm	.953	**24.20 mm**	**(5x)**	25.11 mm	.91 mm	6 mm	75 mm	**V918663**	99.50	**V918663-V**	107.00
.1732	4.400 mm	1.472	**37.40 mm**	**(8x)**	38.31 mm	.91 mm	6 mm	100 mm	**V356654**	162.50	**V356654-V**	170.50
.1771	4.500 mm	.976	**24.80 mm**	**(5x)**	25.73 mm	.93 mm	6 mm	75 mm	**V383315**	99.50	**V383315-V**	107.00
.1771	4.500 mm	1.504	**38.20 mm**	**(8x)**	39.13 mm	.93 mm	6 mm	100 mm	**V703950**	162.50	**V703950-V**	170.50
.1811	4.600 mm	.992	**25.20 mm**	**(5x)**	26.15 mm	.95 mm	6 mm	75 mm	**V342441**	99.50	**V342441-V**	107.00
.1811	4.600 mm	1.535	**39.00 mm**	**(8x)**	39.95 mm	.95 mm	6 mm	100 mm	**V202174**	162.50	**V202174-V**	170.50
.1850	4.700 mm	1.016	**25.80 mm**	**(5x)**	26.77 mm	.97 mm	6 mm	75 mm	**V689582**	99.50	**V689582-V**	107.00
.1850	4.700 mm	1.575	**40.00 mm**	**(8x)**	40.97 mm	.97 mm	6 mm	100 mm	**V928497**	162.50	**V928497-V**	170.50
.1875 (3/16)	4.762 mm	1.032	**26.20 mm**	**(5x)**	27.19 mm	.99 mm	6 mm	75 mm	**V675548**	99.50	**V675548-V**	107.00
.1875 (3/16)	4.762 mm	1.591	**40.40 mm**	**(8x)**	41.39 mm	.99 mm	6 mm	100 mm	**V431500**	162.50	**V431500-V**	170.50
.1890	4.800 mm	1.039	**26.40 mm**	**(5x)**	27.39 mm	.99 mm	6 mm	75 mm	**V926654**	99.50	**V926654-V**	107.00
.1890	4.800 mm	1.606	**40.80 mm**	**(8x)**	41.79 mm	.99 mm	6 mm	100 mm	**V253484**	162.50	**V253484-V**	170.50
.1930	4.900 mm	1.063	**27.00 mm**	**(5x)**	28.01 mm	1.01 mm	6 mm	75 mm	**V417508**	99.50	**V417508-V**	107.00
.1930	4.900 mm	1.638	**41.60 mm**	**(8x)**	42.61 mm	1.01 mm	6 mm	100 mm	**V904772**	162.50	**V904772-V**	170.50

* For h6 and h8 tolerances, see page 8.

continued on next page

High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

continued from previous page

Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.1968	5.000 mm	1.087	**27.60 mm**	(5x)	28.64 mm	1.04 mm	6 mm	75 mm	**V761883**	99.50	**V761883-V**	107.00
.1968	5.000 mm	1.677	**42.60 mm**	(8x)	43.64 mm	1.04 mm	6 mm	100 mm	**V858075**	162.50	**V858075-V**	170.50
.2007	5.100 mm	1.102	**28.00 mm**	(5x)	29.06 mm	1.06 mm	6 mm	75 mm	**V487502**	99.50	**V487502-V**	107.00
.2007	5.100 mm	1.709	**43.40 mm**	(8x)	44.46 mm	1.06 mm	6 mm	100 mm	**V663020**	162.50	**V663020-V**	170.50
.2031 (13/64)	5.159 mm	1.118	**28.40 mm**	(5x)	29.47 mm	1.07 mm	6 mm	75 mm	**V802986**	99.50	**V802986-V**	107.00
.2031 (13/64)	5.159 mm	1.724	**43.80 mm**	(8x)	44.87 mm	1.07 mm	6 mm	100 mm	**V386945**	162.50	**V386945-V**	170.50
.2047	5.200 mm	1.126	**28.60 mm**	(5x)	29.68 mm	1.08 mm	6 mm	75 mm	**V411179**	99.50	**V411179-V**	107.00
.2047	5.200 mm	1.740	**44.20 mm**	(8x)	45.28 mm	1.08 mm	6 mm	100 mm	**V855920**	162.50	**V855920-V**	170.50
.2086	5.300 mm	1.150	**29.20 mm**	(5x)	30.30 mm	1.10 mm	6 mm	75 mm	**V969066**	99.50	**V969066-V**	107.00
.2086	5.300 mm	1.772	**45.00 mm**	(8x)	46.10 mm	1.10 mm	6 mm	100 mm	**V555520**	162.50	**V555520-V**	170.50
.2125	5.400 mm	1.173	**29.80 mm**	(5x)	30.92 mm	1.12 mm	6 mm	75 mm	**V923077**	99.50	**V923077-V**	107.00
.2125	5.400 mm	1.811	**46.00 mm**	(8x)	47.12 mm	1.12 mm	6 mm	100 mm	**V412862**	162.50	**V412862-V**	170.50
.2165	5.500 mm	1.189	**30.20 mm**	(5x)	31.34 mm	1.14 mm	6 mm	75 mm	**V332947**	99.50	**V332947-V**	107.00
.2165	5.500 mm	1.843	**46.80 mm**	(8x)	47.94 mm	1.14 mm	6 mm	100 mm	**V692720**	162.50	**V692720-V**	170.50
.2187 (7/32)	5.556 mm	1.205	**30.60 mm**	(5x)	31.75 mm	1.15 mm	6 mm	75 mm	**V192488**	99.50	**V192488-V**	107.00
.2187 (7/32)	5.556 mm	1.858	**47.20 mm**	(8x)	48.35 mm	1.15 mm	6 mm	100 mm	**V421981**	162.50	**V421981-V**	170.50
.2205	5.600 mm	1.213	**30.80 mm**	(5x)	31.96 mm	1.16 mm	6 mm	75 mm	**V300624**	99.50	**V300624-V**	107.00
.2205	5.600 mm	1.874	**47.60 mm**	(8x)	48.76 mm	1.16 mm	6 mm	100 mm	**V625957**	162.50	**V625957-V**	170.50
.2244	5.700 mm	1.236	**31.40 mm**	(5x)	32.58 mm	1.18 mm	6 mm	75 mm	**V932148**	99.50	**V932148-V**	107.00
.2244	5.700 mm	1.906	**48.40 mm**	(8x)	49.58 mm	1.18 mm	6 mm	100 mm	**V662636**	162.50	**V662636-V**	170.50
.2283	5.800 mm	1.252	**31.80 mm**	(5x)	33.00 mm	1.20 mm	6 mm	75 mm	**V583286**	99.50	**V583286-V**	107.00
.2283	5.800 mm	1.937	**49.20 mm**	(8x)	50.40 mm	1.20 mm	6 mm	100 mm	**V664218**	162.50	**V664218-V**	170.50
.2322	5.900 mm	1.276	**32.40 mm**	(5x)	33.62 mm	1.22 mm	6 mm	75 mm	**V424468**	99.50	**V424468-V**	107.00
.2322	5.900 mm	1.976	**50.20 mm**	(8x)	51.42 mm	1.22 mm	6 mm	100 mm	**V406472**	162.50	**V406472-V**	170.50
.2343 (15/64)	5.953 mm	1.291	**32.80 mm**	(5x)	34.03 mm	1.23 mm	6 mm	75 mm	**V483232**	99.50	**V483232-V**	107.00
.2343 (15/64)	5.953 mm	1.992	**50.60 mm**	(8x)	51.83 mm	1.23 mm	6 mm	100 mm	**V857943**	162.50	**V857943-V**	170.50
.2362	6.000 mm	1.299	**33.00 mm**	(5x)	34.24 mm	1.24 mm	8 mm	100 mm	**V514442**	99.50	**V514442-V**	109.50
.2362	6.000 mm	2.008	**51.00 mm**	(8x)	52.24 mm	1.24 mm	8 mm	125 mm	**V965807**	162.50	**V965807-V**	173.00
.2401	6.100 mm	1.319	**33.50 mm**	(5x)	34.76 mm	1.26 mm	8 mm	100 mm	**V699389**	128.50	**V699389-V**	138.50
.2401	6.100 mm	2.047	**52.00 mm**	(8x)	53.26 mm	1.26 mm	8 mm	125 mm	**V512364**	223.00	**V512364-V**	233.50
.2440	6.200 mm	1.339	**34.00 mm**	(5x)	35.28 mm	1.28 mm	8 mm	100 mm	**V333318**	128.50	**V333318-V**	138.50
.2440	6.200 mm	2.067	**52.50 mm**	(8x)	53.78 mm	1.28 mm	8 mm	125 mm	**V246360**	223.00	**V246360-V**	233.50
.2480	6.300 mm	1.358	**34.50 mm**	(5x)	35.80 mm	1.30 mm	8 mm	100 mm	**V716403**	128.50	**V716403-V**	138.50
.2480	6.300 mm	2.106	**53.50 mm**	(8x)	54.80 mm	1.30 mm	8 mm	125 mm	**V171510**	223.00	**V171510-V**	233.50
.2500 (1/4)	6.350 mm	1.378	**35.00 mm**	(5x)	36.32 mm	1.32 mm	8 mm	100 mm	**V924120**	128.50	**V924120-V**	138.50
.2500 (1/4)	6.350 mm	2.126	**54.00 mm**	(8x)	55.32 mm	1.32 mm	8 mm	125 mm	**V515046**	223.00	**V515046-V**	233.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.2520	6.400 mm	1.378	**35.00 mm**	(5x)	36.33 mm	1.33 mm	8 mm	100 mm	**V952739**	128.50	**V952739-V**	138.50
.2520	6.400 mm	2.146	**54.50 mm**	(8x)	55.83 mm	1.33 mm	8 mm	125 mm	**V442929**	223.00	**V442929-V**	233.50
.2559	6.500 mm	1.417	**36.00 mm**	(5x)	37.35 mm	1.35 mm	8 mm	100 mm	**V252657**	128.50	**V252657-V**	138.50
.2559	6.500 mm	2.185	**55.50 mm**	(8x)	56.85 mm	1.35 mm	8 mm	125 mm	**V981850**	223.00	**V981850-V**	233.50
.2598	6.600 mm	1.437	**36.50 mm**	(5x)	37.87 mm	1.37 mm	8 mm	100 mm	**V522677**	128.50	**V522677-V**	138.50
.2598	6.600 mm	2.205	**56.00 mm**	(8x)	57.37 mm	1.37 mm	8 mm	125 mm	**V583091**	223.00	**V583091-V**	233.50
.2638	6.700 mm	1.457	**37.00 mm**	(5x)	38.39 mm	1.39 mm	8 mm	100 mm	**V144907**	128.50	**V144907-V**	138.50
.2638	6.700 mm	2.244	**57.00 mm**	(8x)	58.39 mm	1.39 mm	8 mm	125 mm	**V320537**	223.00	**V320537-V**	233.50
.2656 (17/64)	6.746 mm	1.457	**37.00 mm**	(5x)	38.40 mm	1.40 mm	8 mm	100 mm	**V822656**	128.50	**V822656-V**	138.50
.2656 (17/64)	6.746 mm	2.264	**57.50 mm**	(8x)	58.90 mm	1.40 mm	8 mm	125 mm	**V403247**	223.00	**V403247-V**	233.50
.2677	6.800 mm	1.476	**37.50 mm**	(5x)	38.91 mm	1.41 mm	8 mm	100 mm	**V390334**	128.50	**V390334-V**	138.50
.2677	6.800 mm	2.284	**58.00 mm**	(8x)	59.41 mm	1.41 mm	8 mm	125 mm	**V892039**	223.00	**V892039-V**	233.50
.2717	6.900 mm	1.496	**38.00 mm**	(5x)	39.43 mm	1.43 mm	8 mm	100 mm	**V359934**	128.50	**V359934-V**	138.50
.2717	6.900 mm	2.303	**58.50 mm**	(8x)	59.93 mm	1.43 mm	8 mm	125 mm	**V272766**	223.00	**V272766-V**	233.50
.2756	7.000 mm	1.516	**38.50 mm**	(5x)	39.95 mm	1.45 mm	8 mm	100 mm	**V849487**	128.50	**V849487-V**	138.50
.2756	7.000 mm	2.343	**59.50 mm**	(8x)	60.95 mm	1.45 mm	8 mm	125 mm	**V582978**	223.00	**V582978-V**	233.50
.2795	7.100 mm	1.535	**39.00 mm**	(5x)	40.47 mm	1.47 mm	8 mm	100 mm	**V608576**	128.50	**V608576-V**	138.50
.2795	7.100 mm	2.382	**60.50 mm**	(8x)	61.97 mm	1.47 mm	8 mm	125 mm	**V700117**	223.00	**V700117-V**	233.50
.2812 (9/32)	7.142 mm	1.555	**39.50 mm**	(5x)	40.98 mm	1.48 mm	8 mm	100 mm	**V808410**	128.50	**V808410-V**	138.50
.2812 (9/32)	7.142 mm	2.382	**60.50 mm**	(8x)	61.98 mm	1.48 mm	8 mm	125 mm	**V298615**	223.00	**V298615-V**	233.50
.2834	7.200 mm	1.555	**39.50 mm**	(5x)	40.99 mm	1.49 mm	8 mm	100 mm	**V476150**	128.50	**V476150-V**	138.50
.2834	7.200 mm	2.402	**61.00 mm**	(8x)	62.49 mm	1.49 mm	8 mm	125 mm	**V933182**	223.00	**V933182-V**	233.50
.2874	7.300 mm	1.575	**40.00 mm**	(5x)	41.51 mm	1.51 mm	8 mm	100 mm	**V207592**	128.50	**V207592-V**	138.50
.2874	7.300 mm	2.441	**62.00 mm**	(8x)	63.51 mm	1.51 mm	8 mm	125 mm	**V359441**	223.00	**V359441-V**	233.50
.2913	7.400 mm	1.595	**40.50 mm**	(5x)	42.03 mm	1.53 mm	8 mm	100 mm	**V902089**	128.50	**V902089-V**	138.50
.2913	7.400 mm	2.480	**63.00 mm**	(8x)	64.53 mm	1.53 mm	8 mm	125 mm	**V654235**	223.00	**V654235-V**	233.50
.2952	7.500 mm	1.634	**41.50 mm**	(5x)	43.05 mm	1.55 mm	8 mm	100 mm	**V137771**	128.50	**V137771-V**	138.50
.2952	7.500 mm	2.520	**64.00 mm**	(8x)	65.55 mm	1.55 mm	8 mm	125 mm	**V444829**	223.00	**V444829-V**	233.50
.2969 (19/64)	7.541 mm	1.634	**41.50 mm**	(5x)	43.06 mm	1.56 mm	8 mm	100 mm	**V645522**	128.50	**V645522-V**	138.50
.2969 (19/64)	7.541 mm	2.520	**64.00 mm**	(8x)	65.56 mm	1.56 mm	8 mm	125 mm	**V319299**	223.00	**V319299-V**	233.50
.2992	7.600 mm	1.654	**42.00 mm**	(5x)	43.57 mm	1.57 mm	8 mm	100 mm	**V871764**	128.50	**V871764-V**	138.50
.2992	7.600 mm	2.539	**64.50 mm**	(8x)	66.07 mm	1.57 mm	8 mm	125 mm	**V937150**	223.00	**V937150-V**	233.50
.3031	7.700 mm	1.673	**42.50 mm**	(5x)	44.09 mm	1.59 mm	8 mm	100 mm	**V272800**	128.50	**V272800-V**	138.50
.3031	7.700 mm	2.579	**65.50 mm**	(8x)	67.09 mm	1.59 mm	8 mm	125 mm	**V733422**	223.00	**V733422-V**	233.50
.3071	7.800 mm	1.693	**43.00 mm**	(5x)	44.62 mm	1.62 mm	8 mm	100 mm	**V444378**	128.50	**V444378-V**	138.50
.3071	7.800 mm	2.618	**66.50 mm**	(8x)	68.12 mm	1.62 mm	8 mm	125 mm	**V467902**	223.00	**V467902-V**	233.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.3110	7.900 mm	1.713	**43.50 mm**	**(5x)**	45.14 mm	1.64 mm	8 mm	100 mm	**V838506**	128.50	**V838506-V**	138.50
.3110	7.900 mm	2.638	**67.00 mm**	**(8x)**	68.64 mm	1.64 mm	8 mm	125 mm	**V118204**	223.00	**V118204-V**	233.50
.3125 (5/16)	7.937 mm	1.713	**43.50 mm**	**(5x)**	45.14 mm	1.64 mm	8 mm	100 mm	**V534118**	128.50	**V534118-V**	138.50
.3125 (5/16)	7.937 mm	2.658	**67.50 mm**	**(8x)**	69.14 mm	1.64 mm	8 mm	125 mm	**V181162**	223.00	**V181162-V**	233.50
.3150	8.000 mm	1.732	**44.00 mm**	**(5x)**	45.66 mm	1.66 mm	10 mm	100 mm	**V631086**	128.50	**V631086-V**	140.00
.3150	8.000 mm	2.677	**68.00 mm**	**(8x)**	69.66 mm	1.66 mm	10 mm	125 mm	**V372448**	223.00	**V372448-V**	235.50
.3189	8.100 mm	1.752	**44.50 mm**	**(5x)**	46.18 mm	1.68 mm	10 mm	100 mm	**V480410**	146.50	**V480410-V**	158.00
.3189	8.100 mm	2.717	**69.00 mm**	**(8x)**	70.68 mm	1.68 mm	10 mm	125 mm	**V373765**	244.50	**V373765-V**	257.00
.3228	8.200 mm	1.772	**45.00 mm**	**(5x)**	46.70 mm	1.70 mm	10 mm	100 mm	**V668382**	146.50	**V668382-V**	158.00
.3228	8.200 mm	2.736	**69.50 mm**	**(8x)**	71.20 mm	1.70 mm	10 mm	125 mm	**V581134**	244.50	**V581134-V**	257.00
.3268	8.300 mm	1.791	**45.50 mm**	**(5x)**	47.22 mm	1.72 mm	10 mm	100 mm	**V386606**	146.50	**V386606-V**	158.00
.3268	8.300 mm	2.776	**70.50 mm**	**(8x)**	72.22 mm	1.72 mm	10 mm	125 mm	**V496970**	244.50	**V496970-V**	257.00
.3281 (21/64)	8.333 mm	1.811	**46.00 mm**	**(5x)**	47.73 mm	1.73 mm	10 mm	100 mm	**V904466**	146.50	**V904466-V**	158.00
.3281 (21/64)	8.333 mm	2.795	**71.00 mm**	**(8x)**	72.73 mm	1.73 mm	10 mm	125 mm	**V185340**	244.50	**V185340-V**	257.00
.3307	8.400 mm	1.811	**46.00 mm**	**(5x)**	47.74 mm	1.74 mm	10 mm	100 mm	**V336999**	146.50	**V336999-V**	158.00
.3307	8.400 mm	2.815	**71.50 mm**	**(8x)**	73.24 mm	1.74 mm	10 mm	125 mm	**V555396**	244.50	**V555396-V**	257.00
.3346	8.500 mm	1.850	**47.00 mm**	**(5x)**	48.76 mm	1.76 mm	10 mm	100 mm	**V944598**	146.50	**V944598-V**	158.00
.3346	8.500 mm	2.854	**72.50 mm**	**(8x)**	74.26 mm	1.76 mm	10 mm	125 mm	**V102862**	244.50	**V102862-V**	257.00
.3386	8.600 mm	1.870	**47.50 mm**	**(5x)**	49.28 mm	1.78 mm	10 mm	100 mm	**V129890**	146.50	**V129890-V**	158.00
.3386	8.600 mm	2.874	**73.00 mm**	**(8x)**	74.78 mm	1.78 mm	10 mm	125 mm	**V259256**	244.50	**V259256-V**	257.00
.3425	8.700 mm	1.890	**48.00 mm**	**(5x)**	49.80 mm	1.80 mm	10 mm	100 mm	**V364436**	146.50	**V364436-V**	158.00
.3425	8.700 mm	2.913	**74.00 mm**	**(8x)**	75.80 mm	1.80 mm	10 mm	125 mm	**V578927**	244.50	**V578927-V**	257.00
.3438 (11/32)	8.732 mm	1.890	**48.00 mm**	**(5x)**	49.81 mm	1.81 mm	10 mm	100 mm	**V960893**	146.50	**V960893-V**	158.00
.3438 (11/32)	8.732 mm	2.913	**74.00 mm**	**(8x)**	75.81 mm	1.81 mm	10 mm	125 mm	**V828826**	244.50	**V828826-V**	257.00
.3465	8.800 mm	1.909	**48.50 mm**	**(5x)**	50.32 mm	1.82 mm	10 mm	100 mm	**V295589**	146.50	**V295589-V**	158.00
.3465	8.800 mm	2.953	**75.00 mm**	**(8x)**	76.82 mm	1.82 mm	10 mm	125 mm	**V682221**	244.50	**V682221-V**	257.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.3504	8.900 mm	1.929	**49.00 mm**	(5x)	50.84 mm	1.84 mm	10 mm	100 mm	**V837355**	146.50	**V837355-V**	158.00
.3504	8.900 mm	2.972	**75.50 mm**	(8x)	77.34 mm	1.84 mm	10 mm	150 mm	**V650588**	244.50	**V650588-V**	258.00
.3543	9.000 mm	1.949	**49.50 mm**	(5x)	51.36 mm	1.86 mm	10 mm	100 mm	**V883001**	146.50	**V883001-V**	158.00
.3543	9.000 mm	3.012	**76.50 mm**	(8x)	78.36 mm	1.86 mm	10 mm	150 mm	**V158250**	244.50	**V158250-V**	258.00
.3583	9.100 mm	1.969	**50.00 mm**	(5x)	51.88 mm	1.88 mm	10 mm	100 mm	**V819645**	146.50	**V819645-V**	158.00
.3583	9.100 mm	3.051	**77.50 mm**	(8x)	79.38 mm	1.88 mm	10 mm	150 mm	**V132901**	244.50	**V132901-V**	258.00
.3594 (23/64)	9.128 mm	1.969	**50.00 mm**	(5x)	51.89 mm	1.89 mm	10 mm	100 mm	**V655775**	146.50	**V655775-V**	158.00
.3594 (23/64)	9.128 mm	3.051	**77.50 mm**	(8x)	79.39 mm	1.89 mm	10 mm	150 mm	**V272571**	244.50	**V272571-V**	258.00
.3622	9.200 mm	1.988	**50.50 mm**	(5x)	52.41 mm	1.91 mm	10 mm	100 mm	**V687657**	146.50	**V687657-V**	158.00
.3622	9.200 mm	3.071	**78.00 mm**	(8x)	79.91 mm	1.91 mm	10 mm	150 mm	**V871378**	244.50	**V871378-V**	258.00
.3661	9.300 mm	2.008	**51.00 mm**	(5x)	52.93 mm	1.93 mm	10 mm	100 mm	**V787709**	146.50	**V787709-V**	158.00
.3661	9.300 mm	3.110	**79.00 mm**	(8x)	80.93 mm	1.93 mm	10 mm	150 mm	**V503354**	244.50	**V503354-V**	258.00
.3701	9.400 mm	2.028	**51.50 mm**	(5x)	53.45 mm	1.95 mm	10 mm	100 mm	**V307018**	146.50	**V307018-V**	158.00
.3701	9.400 mm	3.150	**80.00 mm**	(8x)	81.95 mm	1.95 mm	10 mm	150 mm	**V207468**	244.50	**V207468-V**	258.00
.3740	9.500 mm	2.067	**52.50 mm**	(5x)	54.47 mm	1.97 mm	10 mm	100 mm	**V718117**	146.50	**V718117-V**	158.00
.3740	9.500 mm	3.189	**81.00 mm**	(8x)	82.97 mm	1.97 mm	10 mm	150 mm	**V732216**	244.50	**V732216-V**	258.00
.3750 (3/8)	9.525 mm	2.067	**52.50 mm**	(5x)	54.47 mm	1.97 mm	10 mm	100 mm	**V210563**	146.50	**V210563-V**	158.00
.3750 (3/8)	9.525 mm	3.189	**81.00 mm**	(8x)	82.97 mm	1.97 mm	10 mm	150 mm	**V224674**	244.50	**V224674-V**	258.00
.3780	9.600 mm	2.087	**53.00 mm**	(5x)	54.99 mm	1.99 mm	10 mm	100 mm	**V417983**	146.50	**V417983-V**	158.00
.3780	9.600 mm	3.209	**81.50 mm**	(8x)	83.49 mm	1.99 mm	10 mm	150 mm	**V845546**	244.50	**V845546-V**	258.00
.3819	9.700 mm	2.106	**53.50 mm**	(5x)	55.51 mm	2.01 mm	10 mm	100 mm	**V211508**	146.50	**V211508-V**	158.00
.3819	9.700 mm	3.248	**82.50 mm**	(8x)	84.51 mm	2.01 mm	10 mm	150 mm	**V283637**	244.50	**V283637-V**	258.00
.3858	9.800 mm	2.126	**54.00 mm**	(5x)	56.03 mm	2.03 mm	10 mm	100 mm	**V183783**	146.50	**V183783-V**	158.00
.3858	9.800 mm	3.287	**83.50 mm**	(8x)	85.53 mm	2.03 mm	10 mm	150 mm	**V456526**	244.50	**V456526-V**	258.00
.3898	9.900 mm	2.146	**54.50 mm**	(5x)	56.55 mm	2.05 mm	10 mm	100 mm	**V828417**	146.50	**V828417-V**	158.00
.3898	9.900 mm	3.307	**84.00 mm**	(8x)	86.05 mm	2.05 mm	10 mm	150 mm	**V591316**	244.50	**V591316-V**	258.00
.3906 (25/64)	9.921 mm	2.146	**54.50 mm**	(5x)	56.55 mm	2.05 mm	10 mm	100 mm	**V206750**	146.50	**V206750-V**	158.00
.3906 (25/64)	9.921 mm	3.327	**84.50 mm**	(8x)	86.55 mm	2.05 mm	10 mm	150 mm	**V592921**	244.50	**V592921-V**	258.00
.3937	10.000 mm	2.165	**55.00 mm**	(5x)	57.07 mm	2.07 mm	12 mm	125 mm	**V510346**	146.50	**V510346-V**	163.50
.3937	10.000 mm	3.347	**85.00 mm**	(8x)	87.07 mm	2.07 mm	12 mm	150 mm	**V906154**	244.50	**V906154-V**	263.00
.3976	10.100 mm	2.185	**55.50 mm**	(5x)	57.59 mm	2.09 mm	12 mm	125 mm	**V393209**	206.00	**V393209-V**	223.00
.3976	10.100 mm	3.386	**86.00 mm**	(8x)	88.09 mm	2.09 mm	12 mm	150 mm	**V912984**	323.50	**V912984-V**	342.00
.4016	10.200 mm	2.205	**56.00 mm**	(5x)	58.11 mm	2.11 mm	12 mm	125 mm	**V241050**	206.00	**V241050-V**	223.00
.4016	10.200 mm	3.406	**86.50 mm**	(8x)	88.61 mm	2.11 mm	12 mm	150 mm	**V781707**	323.50	**V781707-V**	342.00
.4055	10.300 mm	2.224	**56.50 mm**	(5x)	58.63 mm	2.13 mm	12 mm	125 mm	**V693701**	206.00	**V693701-V**	223.00
.4055	10.300 mm	3.445	**87.50 mm**	(8x)	89.63 mm	2.13 mm	12 mm	150 mm	**V507787**	323.50	**V507787-V**	342.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.4062 (13/32)	10.317 mm	2.224	**56.50 mm**	(5x)	58.64 mm	2.14 mm	12 mm	125 mm	**V426663**	206.00	**V426663-V**	223.00
.4062 (13/32)	10.317 mm	3.445	**87.50 mm**	(8x)	89.64 mm	2.14 mm	12 mm	150 mm	**V165261**	323.50	**V165261-V**	342.00
.4094	10.400 mm	2.244	**57.00 mm**	(5x)	59.15 mm	2.15 mm	12 mm	125 mm	**V805959**	206.00	**V805959-V**	223.00
.4094	10.400 mm	3.484	**88.50 mm**	(8x)	90.65 mm	2.15 mm	12 mm	150 mm	**V585515**	323.50	**V585515-V**	342.00
.4134	10.500 mm	2.284	**58.00 mm**	(5x)	60.17 mm	2.17 mm	12 mm	125 mm	**V891328**	206.00	**V891328-V**	223.00
.4134	10.500 mm	3.524	**89.50 mm**	(8x)	91.67 mm	2.17 mm	12 mm	150 mm	**V656520**	323.50	**V656520-V**	342.00
.4173	10.600 mm	2.303	**58.50 mm**	(5x)	60.70 mm	2.20 mm	12 mm	125 mm	**V811500**	206.00	**V811500-V**	223.00
.4173	10.600 mm	3.543	**90.00 mm**	(8x)	92.20 mm	2.20 mm	12 mm	150 mm	**V517271**	323.50	**V517271-V**	342.00
.4213	10.700 mm	2.323	**59.00 mm**	(5x)	61.22 mm	2.22 mm	12 mm	125 mm	**V980072**	206.00	**V980072-V**	223.00
.4213	10.700 mm	3.583	**91.00 mm**	(8x)	93.22 mm	2.22 mm	12 mm	150 mm	**V352223**	323.50	**V352223-V**	342.00
.4219 (27/64)	10.716 mm	2.323	**59.00 mm**	(5x)	61.22 mm	2.22 mm	12 mm	125 mm	**V422407**	206.00	**V422407-V**	223.00
.4219 (27/64)	10.716 mm	3.583	**91.00 mm**	(8x)	93.22 mm	2.22 mm	12 mm	150 mm	**V628625**	323.50	**V628625-V**	342.00
.4252	10.800 mm	2.343	**59.50 mm**	(5x)	61.74 mm	2.24 mm	12 mm	125 mm	**V433000**	206.00	**V433000-V**	223.00
.4252	10.800 mm	3.622	**92.00 mm**	(8x)	94.24 mm	2.24 mm	12 mm	150 mm	**V876124**	323.50	**V876124-V**	342.00
.4291	10.900 mm	2.362	**60.00 mm**	(5x)	62.26 mm	2.26 mm	12 mm	125 mm	**V507576**	206.00	**V507576-V**	223.00
.4291	10.900 mm	3.642	**92.50 mm**	(8x)	94.76 mm	2.26 mm	12 mm	175 mm	**V959173**	323.50	**V959173-V**	343.50
.4331	11.000 mm	2.382	**60.50 mm**	(5x)	62.78 mm	2.28 mm	12 mm	125 mm	**V216634**	206.00	**V216634-V**	223.00
.4331	11.000 mm	3.681	**93.50 mm**	(8x)	95.78 mm	2.28 mm	12 mm	175 mm	**V705619**	323.50	**V705619-V**	343.50
.4370	11.100 mm	2.402	**61.00 mm**	(5x)	63.30 mm	2.30 mm	12 mm	125 mm	**V838445**	206.00	**V838445-V**	223.00
.4370	11.100 mm	3.721	**94.50 mm**	(8x)	96.80 mm	2.30 mm	12 mm	175 mm	**V554353**	323.50	**V554353-V**	343.50
.4375 (7/16)	11.112 mm	2.402	**61.00 mm**	(5x)	63.30 mm	2.30 mm	12 mm	125 mm	**V258691**	206.00	**V258691-V**	223.00
.4375 (7/16)	11.112 mm	3.721	**94.50 mm**	(8x)	96.80 mm	2.30 mm	12 mm	175 mm	**V865610**	323.50	**V865610-V**	343.50
.4409	11.200 mm	2.421	**61.50 mm**	(5x)	63.82 mm	2.32 mm	12 mm	125 mm	**V837182**	206.00	**V837182-V**	223.00
.4409	11.200 mm	3.740	**95.00 mm**	(8x)	97.32 mm	2.32 mm	12 mm	175 mm	**V638291**	323.50	**V638291-V**	343.50
.4449	11.300 mm	2.441	**62.00 mm**	(5x)	64.34 mm	2.34 mm	12 mm	125 mm	**V104347**	206.00	**V104347-V**	223.00
.4449	11.300 mm	3.780	**96.00 mm**	(8x)	98.34 mm	2.34 mm	12 mm	175 mm	**V923125**	323.50	**V923125-V**	343.50
.4488	11.400 mm	2.461	**62.50 mm**	(5x)	64.86 mm	2.36 mm	12 mm	125 mm	**V145663**	206.00	**V145663-V**	223.00
.4488	11.400 mm	3.819	**97.00 mm**	(8x)	99.36 mm	2.36 mm	12 mm	175 mm	**V218282**	323.50	**V218282-V**	343.50
.4527	11.500 mm	2.500	**63.50 mm**	(5x)	65.88 mm	2.38 mm	12 mm	125 mm	**V845377**	206.00	**V845377-V**	223.00
.4527	11.500 mm	3.858	**98.00 mm**	(8x)	100.38 mm	2.38 mm	12 mm	175 mm	**V679783**	323.50	**V679783-V**	343.50
.4531 (29/64)	11.508 mm	2.500	**63.50 mm**	(5x)	65.88 mm	2.38 mm	12 mm	125 mm	**V520815**	206.00	**V520815-V**	223.00
.4531 (29/64)	11.508 mm	3.858	**98.00 mm**	(8x)	100.38 mm	2.38 mm	12 mm	175 mm	**V960077**	323.50	**V960077-V**	343.50
.4567	11.600 mm	2.520	**64.00 mm**	(5x)	66.40 mm	2.40 mm	12 mm	125 mm	**V214907**	206.00	**V214907-V**	223.00
.4567	11.600 mm	3.878	**98.50 mm**	(8x)	100.90 mm	2.40 mm	12 mm	175 mm	**V307195**	323.50	**V307195-V**	343.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth								
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price	Tool #	Price
.4606	11.700 mm	2.539	**64.50 mm**	**(5x)**	66.92 mm	2.42 mm	12 mm	125 mm	**V858509**	206.00	**V858509-V**	223.00
.4606	11.700 mm	3.917	**99.50 mm**	**(8x)**	101.92 mm	2.42 mm	12 mm	175 mm	**V313087**	323.50	**V313087-V**	343.50
.4646	11.800 mm	2.559	**65.00 mm**	**(5x)**	67.44 mm	2.44 mm	12 mm	125 mm	**V216870**	206.00	**V216870-V**	223.00
.4646	11.800 mm	3.957	**100.50 mm**	**(8x)**	102.94 mm	2.44 mm	12 mm	175 mm	**V902922**	323.50	**V902922-V**	343.50
.4685	11.900 mm	2.579	**65.50 mm**	**(5x)**	67.96 mm	2.46 mm	12 mm	125 mm	**V722943**	206.00	**V722943-V**	223.00
.4685	11.900 mm	3.976	**101.00 mm**	**(8x)**	103.46 mm	2.46 mm	12 mm	175 mm	**V889227**	323.50	**V889227-V**	343.50
.4688 (15/32)	11.907 mm	2.579	**65.50 mm**	**(5x)**	67.97 mm	2.47 mm	12 mm	125 mm	**V715708**	206.00	**V715708-V**	223.00
.4688 (15/32)	11.907 mm	3.976	**101.00 mm**	**(8x)**	103.47 mm	2.47 mm	12 mm	175 mm	**V209677**	323.50	**V209677-V**	343.50
.4724	12.000 mm	2.598	**66.00 mm**	**(5x)**	68.49 mm	2.49 mm	14 mm	125 mm	**V312296**	206.00	**V312296-V**	225.50
.4724	12.000 mm	4.016	**102.00 mm**	**(8x)**	104.49 mm	2.49 mm	14 mm	175 mm	**V339609**	323.50	**V339609-V**	346.50
.4764	12.100 mm	2.618	**66.50 mm**	**(5x)**	69.01 mm	2.51 mm	14 mm	125 mm	**V904889**	284.00	**V904889-V**	303.50
.4764	12.100 mm	4.055	**103.00 mm**	**(8x)**	105.51 mm	2.51 mm	14 mm	175 mm	**V264702**	437.50	**V264702-V**	460.50
.4803	12.200 mm	2.638	**67.00 mm**	**(5x)**	69.53 mm	2.53 mm	14 mm	125 mm	**V727024**	284.00	**V727024-V**	303.50
.4803	12.200 mm	4.075	**103.50 mm**	**(8x)**	106.03 mm	2.53 mm	14 mm	175 mm	**V954879**	437.50	**V954879-V**	460.50
.4843	12.300 mm	2.658	**67.50 mm**	**(5x)**	70.05 mm	2.55 mm	14 mm	125 mm	**V804318**	284.00	**V804318-V**	303.50
.4843	12.300 mm	4.114	**104.50 mm**	**(8x)**	107.05 mm	2.55 mm	14 mm	175 mm	**V559229**	437.50	**V559229-V**	460.50
.4882 (31/64)	12.400 mm	2.677	**68.00 mm**	**(5x)**	70.57 mm	2.57 mm	14 mm	125 mm	**V680043**	284.00	**V680043-V**	303.50
.4882 (31/64)	12.400 mm	4.154	**105.50 mm**	**(8x)**	108.07 mm	2.57 mm	14 mm	175 mm	**V597636**	437.50	**V597636-V**	460.50
.4921	12.500 mm	2.717	**69.00 mm**	**(5x)**	71.59 mm	2.59 mm	14 mm	125 mm	**V396773**	284.00	**V396773-V**	303.50
.4921	12.500 mm	4.193	**106.50 mm**	**(8x)**	109.09 mm	2.59 mm	14 mm	175 mm	**V576237**	437.50	**V576237-V**	460.50
.4961	12.600 mm	2.736	**69.50 mm**	**(5x)**	72.11 mm	2.61 mm	14 mm	125 mm	**V560508**	284.00	**V560508-V**	303.50
.4961	12.600 mm	4.213	**107.00 mm**	**(8x)**	109.61 mm	2.61 mm	14 mm	175 mm	**V511270**	437.50	**V511270-V**	460.50
.5000 (1/2)	12.700 mm	2.756	**70.00 mm**	**(5x)**	72.63 mm	2.63 mm	14 mm	125 mm	**V346191**	284.00	**V346191-V**	303.50
.5000 (1/2)	12.700 mm	4.252	**108.00 mm**	**(8x)**	110.63 mm	2.63 mm	14 mm	175 mm	**V190634**	437.50	**V190634-V**	460.50

* For h6 and h8 tolerances, see page 8.

Tech Tip

When machining in deep hole aluminum applications, coolant-through drills **ensure chips are properly evacuated**, significantly improving tool life. Although aluminum is a softer material, chip evacuation is key to achieving superb part finish.

Speeds & Feeds

High Performance Drills for Aluminum & Aluminum Alloys

Important Notes

Values in table are in inches and are based on standard (up to 7x Dia) length of flute solid carbide drills.
For longer lengths of flute, table values of IPR must be reduced (for 8x, reduce to 75%) and SFM must be reduced (for 8x, reduce to 80%).
For Non-Ferrous materials, the initial peck should be 3-5x Diameter with each subsequent peck at 2-3x Diameter.
For complete speeds and feeds charts, please see **valorholemaking.com/resources/speeds-and-feeds.**

Coolant-Through Notes

For Coolant-through carbide drills, table values of IPR must be reduced (reduced to 90%) and SFM can increase (increase up to 125%).
For best results, the following steps are recommended:

- For hole depths of 7x Diameter or greater, drill a pilot hole up to 1.5-2x D in depth using a drill with 3x LOF or shorter.
- Insert primary drill at low speed (~50-500 RPM) and start coolant flow.
- Increase speed and feed to recommended parameters.
- Under optimal conditions, a pecking cycle should not be needed.
- On through holes, reduce feed rate by 50% just before break through with drill point.
- Feed at 50% to final 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.

Material Guide		SFM	Chip Load (IPR) by Drill Diameter									
			1/16	5/64	3/32	1/8	3/16	1/4	5/16	3/8	7/16	1/2
Wrought Aluminum Alloys	2014, 5062, 6061, 7050, 7075, 7475	350-1500	.003-.004	.003-.004	.004-.005	.005-.006	.005-.007	.006-.008	.008-.010	.009-.012	.010-.013	.011-.015
Cast Aluminum Alloys	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	300-875	.002-.003	.002-.003	.003-.004	.004-.005	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Copper Alloys	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	300-520	.002-.003	.002-.003	.003-.004	.004-.005	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013

General Notes

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions.

If you require additional information, Valor Holemaking has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **866-840-1505** or **Valortech@harveyperformance.com**.

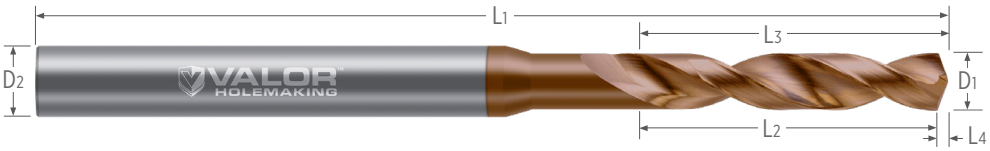
High Performance Drills

For Steels

Double margin design for increased stability

Exceptional Design for Precision Drilling in 4140 Steel

- Optimized for best-in-class performance in 4140 Steel with superior performance in a wide variety of Steels and other Alloy Steels
- Provides excellent performance in Stainless Steels and Cast Iron
- Engineered double margin geometry provides performance and stability when drilling intersecting holes and/or exiting holes on inclined or irregular surfaces
- Pre and post polish process delivers reduced friction and ensures outstanding chip management
- 140° point angle with 4-facet geometry for improved self-centering
- h6 shank tolerance for high precision tool holders
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

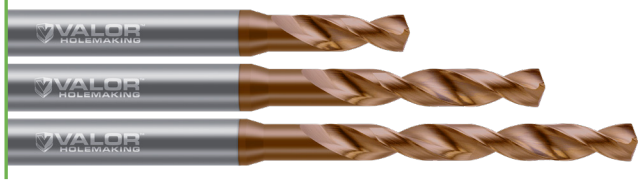


Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.0625 (1/16)	1.587 mm	.221	**5.60 mm**	**(3x)**	5.89 mm	.29 mm	3 mm	63 mm	**V973517-X**	66.50
.0625 (1/16)	1.587 mm	.343	**8.70 mm**	**(5x)**	8.99 mm	.29 mm	3 mm	63 mm	**V296154-X**	85.50
.0625 (1/16)	1.587 mm	.532	**13.50 mm**	**(8x)**	13.79 mm	.29 mm	3 mm	63 mm	**V623340-X**	114.50
.0630	1.600 mm	.221	**5.60 mm**	**(3x)**	5.89 mm	.29 mm	3 mm	63 mm	**V957351-X**	66.50
.0630	1.600 mm	.347	**8.80 mm**	**(5x)**	9.09 mm	.29 mm	3 mm	63 mm	**V462279-X**	85.50
.0630	1.600 mm	.535	**13.60 mm**	**(8x)**	13.89 mm	.29 mm	3 mm	63 mm	**V305247-X**	114.50
.0669	1.700 mm	.236	**6.00 mm**	**(3x)**	6.31 mm	.31 mm	3 mm	63 mm	**V868330-X**	66.50
.0669	1.700 mm	.366	**9.30 mm**	**(5x)**	9.61 mm	.31 mm	3 mm	63 mm	**V118791-X**	85.50
.0669	1.700 mm	.567	**14.40 mm**	**(8x)**	14.71 mm	.31 mm	3 mm	63 mm	**V896049-X**	114.50
.0708	1.800 mm	.248	**6.30 mm**	**(3x)**	6.63 mm	.33 mm	3 mm	63 mm	**V779567-X**	66.50
.0708	1.800 mm	.390	**9.90 mm**	**(5x)**	10.23 mm	.33 mm	3 mm	63 mm	**V794019-X**	85.50
.0708	1.800 mm	.602	**15.30 mm**	**(8x)**	15.63 mm	.33 mm	3 mm	63 mm	**V178926-X**	114.50
.0748	1.900 mm	.260	**6.60 mm**	**(3x)**	6.95 mm	.35 mm	3 mm	63 mm	**V185449-X**	66.50
.0748	1.900 mm	.409	**10.40 mm**	**(5x)**	10.75 mm	.35 mm	3 mm	63 mm	**V249203-X**	85.50
.0748	1.900 mm	.634	**16.10 mm**	**(8x)**	16.45 mm	.35 mm	3 mm	63 mm	**V483409-X**	114.50

* For h6 and h8 tolerances, see page 8.

continued on next page

Stocked in 3x, 5x, and 8x hole depths



High Performance Drills

For Steels (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.0781 (5/64)	1.984 mm	.272	**6.90 mm**	**(3x)**	7.26 mm	.36 mm	3 mm	63 mm	**V467156-X**	66.50
.0781 (5/64)	1.984 mm	.429	**10.90 mm**	**(5x)**	11.26 mm	.36 mm	3 mm	63 mm	**V224870-X**	85.50
.0781 (5/64)	1.984 mm	.665	**16.90 mm**	**(8x)**	17.26 mm	.36 mm	3 mm	63 mm	**V911271-X**	114.50
.0787	2.000 mm	.276	**7.00 mm**	**(3x)**	7.36 mm	.36 mm	3 mm	63 mm	**V826750-X**	66.50
.0787	2.000 mm	.433	**11.00 mm**	**(5x)**	11.36 mm	.36 mm	3 mm	63 mm	**V979538-X**	92.00
.0787	2.000 mm	.669	**17.00 mm**	**(8x)**	17.36 mm	.36 mm	3 mm	63 mm	**V918445-X**	119.50
.0826	2.100 mm	.291	**7.40 mm**	**(3x)**	7.78 mm	.38 mm	3 mm	63 mm	**V110651-X**	66.50
.0826	2.100 mm	.457	**11.60 mm**	**(5x)**	11.98 mm	.38 mm	3 mm	63 mm	**V392180-X**	92.00
.0826	2.100 mm	.705	**17.90 mm**	**(8x)**	18.28 mm	.38 mm	3 mm	63 mm	**V704770-X**	119.50
.0866	2.200 mm	.303	**7.70 mm**	**(3x)**	8.10 mm	.40 mm	3 mm	63 mm	**V569646-X**	66.50
.0866	2.200 mm	.476	**12.10 mm**	**(5x)**	12.50 mm	.40 mm	3 mm	63 mm	**V659262-X**	92.00
.0866	2.200 mm	.736	**18.70 mm**	**(8x)**	19.10 mm	.40 mm	3 mm	63 mm	**V259528-X**	119.50
.0905	2.300 mm	.315	**8.00 mm**	**(3x)**	8.42 mm	.42 mm	3 mm	63 mm	**V519827-X**	66.50
.0905	2.300 mm	.496	**12.60 mm**	**(5x)**	13.02 mm	.42 mm	3 mm	63 mm	**V941185-X**	92.00
.0905	2.300 mm	.768	**19.50 mm**	**(8x)**	19.92 mm	.42 mm	3 mm	63 mm	**V962527-X**	119.50
.0937 (3/32)	2.381 mm	.327	**8.30 mm**	**(3x)**	8.73 mm	.43 mm	3 mm	63 mm	**V964923-X**	66.50
.0937 (3/32)	2.381 mm	.516	**13.10 mm**	**(5x)**	13.53 mm	.43 mm	3 mm	63 mm	**V170896-X**	92.00
.0937 (3/32)	2.381 mm	.795	**20.20 mm**	**(8x)**	20.63 mm	.43 mm	3 mm	63 mm	**V630268-X**	119.50
.0944	2.400 mm	.331	**8.40 mm**	**(3x)**	8.84 mm	.44 mm	3 mm	63 mm	**V713265-X**	66.50
.0944	2.400 mm	.520	**13.20 mm**	**(5x)**	13.64 mm	.44 mm	3 mm	63 mm	**V766011-X**	92.00
.0944	2.400 mm	.803	**20.40 mm**	**(8x)**	20.84 mm	.44 mm	3 mm	63 mm	**V931255-X**	119.50
.0984	2.500 mm	.347	**8.80 mm**	**(3x)**	9.25 mm	.45 mm	3 mm	63 mm	**V441162-X**	68.50
.0984	2.500 mm	.543	**13.80 mm**	**(5x)**	14.25 mm	.45 mm	3 mm	63 mm	**V665871-X**	94.50
.0984	2.500 mm	.839	**21.30 mm**	**(8x)**	21.75 mm	.45 mm	3 mm	63 mm	**V753719-X**	127.00
.1023	2.600 mm	.358	**9.10 mm**	**(3x)**	9.57 mm	.47 mm	3 mm	63 mm	**V776161-X**	68.50
.1023	2.600 mm	.563	**14.30 mm**	**(5x)**	14.77 mm	.47 mm	3 mm	63 mm	**V935510-X**	94.50
.1023	2.600 mm	.870	**22.10 mm**	**(8x)**	22.57 mm	.47 mm	3 mm	63 mm	**V864115-X**	127.00
.1062	2.700 mm	.374	**9.50 mm**	**(3x)**	9.99 mm	.49 mm	3 mm	63 mm	**V375655-X**	68.50
.1062	2.700 mm	.587	**14.90 mm**	**(5x)**	15.39 mm	.49 mm	3 mm	63 mm	**V120072-X**	94.50
.1062	2.700 mm	.906	**23.00 mm**	**(8x)**	23.49 mm	.49 mm	3 mm	63 mm	**V111219-X**	127.00
.1093 (7/64)	2.778 mm	.382	**9.70 mm**	**(3x)**	10.21 mm	.51 mm	3 mm	63 mm	**V959991-X**	68.50
.1093 (7/64)	2.778 mm	.602	**15.30 mm**	**(5x)**	15.81 mm	.51 mm	3 mm	63 mm	**V610313-X**	94.50
.1093 (7/64)	2.778 mm	.929	**23.60 mm**	**(8x)**	24.11 mm	.51 mm	3 mm	63 mm	**V254288-X**	127.00
.1102	2.800 mm	.386	**9.80 mm**	**(3x)**	10.31 mm	.51 mm	3 mm	63 mm	**V113654-X**	68.50
.1102	2.800 mm	.606	**15.40 mm**	**(5x)**	15.91 mm	.51 mm	3 mm	63 mm	**V555135-X**	94.50
.1102	2.800 mm	.937	**23.80 mm**	**(8x)**	24.31 mm	.51 mm	3 mm	63 mm	**V587228-X**	127.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.1141	2.900 mm	.402	**10.20 mm**	**(3x)**	10.73 mm	.53 mm	3 mm	63 mm	**V934711-X**	68.50
.1141	2.900 mm	.626	**15.90 mm**	**(5x)**	16.43 mm	.53 mm	3 mm	63 mm	**V425270-X**	94.50
.1141	2.900 mm	.969	**24.60 mm**	**(8x)**	25.13 mm	.53 mm	3 mm	63 mm	**V466163-X**	127.00
.1181	3.000 mm	.417	**10.60 mm**	**(3x)**	11.15 mm	.55 mm	4 mm	63 mm	**V448334-X**	68.50
.1181	3.000 mm	.654	**16.60 mm**	**(5x)**	17.15 mm	.55 mm	4 mm	63 mm	**V728184-X**	94.50
.1181	3.000 mm	1.008	**25.60 mm**	**(8x)**	26.15 mm	.55 mm	4 mm	75 mm	**V816162-X**	127.00
.1220	3.100 mm	.425	**10.80 mm**	**(3x)**	11.36 mm	.56 mm	4 mm	63 mm	**V980525-X**	58.50
.1220	3.100 mm	.669	**17.00 mm**	**(5x)**	17.56 mm	.56 mm	4 mm	63 mm	**V262531-X**	75.50
.1220	3.100 mm	1.039	**26.40 mm**	**(8x)**	26.96 mm	.56 mm	4 mm	75 mm	**V175931-X**	173.00
.1250 (1/8)	3.175 mm	.441	**11.20 mm**	**(3x)**	11.78 mm	.58 mm	4 mm	63 mm	**V757262-X**	58.50
.1250 (1/8)	3.175 mm	.685	**17.40 mm**	**(5x)**	17.98 mm	.58 mm	4 mm	63 mm	**V407402-X**	75.50
.1250 (1/8)	3.175 mm	1.063	**27.00 mm**	**(8x)**	27.58 mm	.58 mm	4 mm	75 mm	**V143044-X**	173.00
.1260	3.200 mm	.441	**11.20 mm**	**(3x)**	11.78 mm	.58 mm	4 mm	63 mm	**V241601-X**	58.50
.1260	3.200 mm	.693	**17.60 mm**	**(5x)**	18.18 mm	.58 mm	4 mm	63 mm	**V864366-X**	75.50
.1260	3.200 mm	1.071	**27.20 mm**	**(8x)**	27.78 mm	.58 mm	4 mm	75 mm	**V191656-X**	173.00
.1300	3.300 mm	.457	**11.60 mm**	**(3x)**	12.20 mm	.60 mm	4 mm	63 mm	**V446101-X**	58.50
.1300	3.300 mm	.717	**18.20 mm**	**(5x)**	18.80 mm	.60 mm	4 mm	63 mm	**V427484-X**	75.50
.1300	3.300 mm	1.102	**28.00 mm**	**(8x)**	28.60 mm	.60 mm	4 mm	75 mm	**V274069-X**	173.00
.1338	3.400 mm	.472	**12.00 mm**	**(3x)**	12.62 mm	.62 mm	4 mm	63 mm	**V345119-X**	58.50
.1338	3.400 mm	.732	**18.60 mm**	**(5x)**	19.22 mm	.62 mm	4 mm	63 mm	**V570427-X**	75.50
.1338	3.400 mm	1.134	**28.80 mm**	**(8x)**	29.42 mm	.62 mm	4 mm	75 mm	**V471156-X**	173.00
.1377	3.500 mm	.480	**12.20 mm**	**(3x)**	12.84 mm	.64 mm	4 mm	63 mm	**V219223-X**	58.50
.1377	3.500 mm	.756	**19.20 mm**	**(5x)**	19.84 mm	.64 mm	4 mm	63 mm	**V969665-X**	75.50
.1377	3.500 mm	1.173	**29.80 mm**	**(8x)**	30.44 mm	.64 mm	4 mm	75 mm	**V715223-X**	173.00
.1406 (9/64)	3.571 mm	.488	**12.40 mm**	**(3x)**	13.05 mm	.65 mm	4 mm	63 mm	**V119018-X**	58.50
.1406 (9/64)	3.571 mm	.772	**19.60 mm**	**(5x)**	20.25 mm	.65 mm	4 mm	63 mm	**V859368-X**	75.50
.1406 (9/64)	3.571 mm	1.197	**30.40 mm**	**(8x)**	31.05 mm	.65 mm	4 mm	75 mm	**V711502-X**	173.00
.1417	3.600 mm	.496	**12.60 mm**	**(3x)**	13.26 mm	.66 mm	4 mm	63 mm	**V171654-X**	58.50
.1417	3.600 mm	.780	**19.80 mm**	**(5x)**	20.46 mm	.66 mm	4 mm	63 mm	**V306978-X**	75.50
.1417	3.600 mm	1.205	**30.60 mm**	**(8x)**	31.26 mm	.66 mm	4 mm	75 mm	**V463513-X**	173.00
.1456	3.700 mm	.512	**13.00 mm**	**(3x)**	13.67 mm	.67 mm	4 mm	63 mm	**V372278-X**	58.50
.1456	3.700 mm	.803	**20.40 mm**	**(5x)**	21.07 mm	.67 mm	4 mm	63 mm	**V418855-X**	75.50
.1456	3.700 mm	1.236	**31.40 mm**	**(8x)**	32.07 mm	.67 mm	4 mm	75 mm	**V648706-X**	173.00
.1496	3.800 mm	.520	**13.20 mm**	**(3x)**	13.89 mm	.69 mm	4 mm	63 mm	**V381981-X**	58.50
.1496	3.800 mm	.819	**20.80 mm**	**(5x)**	21.49 mm	.69 mm	4 mm	63 mm	**V770195-X**	75.50
.1496	3.800 mm	1.268	**32.20 mm**	**(8x)**	32.89 mm	.69 mm	4 mm	75 mm	**V511673-X**	173.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.1535	3.900 mm	.535	**13.60 mm**	**(3x)**	14.31 mm	.71 mm	4 mm	63 mm	**V464029-X**	58.50
.1535	3.900 mm	.843	**21.40 mm**	**(5x)**	22.11 mm	.71 mm	4 mm	63 mm	**V916343-X**	75.50
.1535	3.900 mm	1.307	**33.20 mm**	**(8x)**	33.91 mm	.71 mm	4 mm	75 mm	**V641665-X**	173.00
.1562 (5/32)	3.968 mm	.543	**13.80 mm**	**(3x)**	14.52 mm	.72 mm	4 mm	63 mm	**V535133-X**	58.50
.1562 (5/32)	3.968 mm	.858	**21.80 mm**	**(5x)**	22.52 mm	.72 mm	4 mm	63 mm	**V651106-X**	75.50
.1562 (5/32)	3.968 mm	1.331	**33.80 mm**	**(8x)**	34.52 mm	.72 mm	4 mm	75 mm	**V484175-X**	173.00
.1574	4.000 mm	.551	**14.00 mm**	**(3x)**	14.73 mm	.73 mm	6 mm	63 mm	**V956543-X**	62.50
.1574	4.000 mm	.866	**22.00 mm**	**(5x)**	22.73 mm	.73 mm	6 mm	75 mm	**V973327-X**	77.50
.1574	4.000 mm	1.339	**34.00 mm**	**(8x)**	34.73 mm	.73 mm	6 mm	100 mm	**V228877-X**	173.00
.1614	4.100 mm	.567	**14.40 mm**	**(3x)**	15.15 mm	.75 mm	6 mm	63 mm	**V144711-X**	62.50
.1614	4.100 mm	.890	**22.60 mm**	**(5x)**	23.35 mm	.75 mm	6 mm	75 mm	**V159304-X**	77.50
.1614	4.100 mm	1.370	**34.80 mm**	**(8x)**	35.55 mm	.75 mm	6 mm	100 mm	**V830649-X**	173.00
.1653	4.200 mm	.583	**14.80 mm**	**(3x)**	15.56 mm	.76 mm	6 mm	63 mm	**V691502-X**	62.50
.1653	4.200 mm	.913	**23.20 mm**	**(5x)**	23.96 mm	.76 mm	6 mm	75 mm	**V390642-X**	77.50
.1653	4.200 mm	1.409	**35.80 mm**	**(8x)**	36.56 mm	.76 mm	6 mm	100 mm	**V717833-X**	173.00
.1692	4.300 mm	.591	**15.00 mm**	**(3x)**	15.78 mm	.78 mm	6 mm	63 mm	**V853410-X**	62.50
.1692	4.300 mm	.929	**23.60 mm**	**(5x)**	24.38 mm	.78 mm	6 mm	75 mm	**V641050-X**	77.50
.1692	4.300 mm	1.441	**36.60 mm**	**(8x)**	37.38 mm	.78 mm	6 mm	100 mm	**V349549-X**	173.00
.1718 (11/64)	4.365 mm	.598	**15.20 mm**	**(3x)**	15.99 mm	.79 mm	6 mm	63 mm	**V690088-X**	62.50
.1718 (11/64)	4.365 mm	.945	**24.00 mm**	**(5x)**	24.79 mm	.79 mm	6 mm	75 mm	**V202897-X**	77.50
.1718 (11/64)	4.365 mm	1.465	**37.20 mm**	**(8x)**	37.99 mm	.79 mm	6 mm	100 mm	**V430080-X**	173.00
.1732	4.400 mm	.606	**15.40 mm**	**(3x)**	16.20 mm	.80 mm	6 mm	63 mm	**V696930-X**	62.50
.1732	4.400 mm	.953	**24.20 mm**	**(5x)**	25.00 mm	.80 mm	6 mm	75 mm	**V454165-X**	77.50
.1732	4.400 mm	1.472	**37.40 mm**	**(8x)**	38.20 mm	.80 mm	6 mm	100 mm	**V609491-X**	173.00
.1771	4.500 mm	.622	**15.80 mm**	**(3x)**	16.62 mm	.82 mm	6 mm	63 mm	**V945678-X**	62.50
.1771	4.500 mm	.976	**24.80 mm**	**(5x)**	25.62 mm	.82 mm	6 mm	75 mm	**V104541-X**	77.50
.1771	4.500 mm	1.504	**38.20 mm**	**(8x)**	39.02 mm	.82 mm	6 mm	100 mm	**V997034-X**	173.00
.1811	4.600 mm	.630	**16.00 mm**	**(3x)**	16.84 mm	.84 mm	6 mm	63 mm	**V587145-X**	62.50
.1811	4.600 mm	.992	**25.20 mm**	**(5x)**	26.04 mm	.84 mm	6 mm	75 mm	**V781819-X**	77.50
.1811	4.600 mm	1.535	**39.00 mm**	**(8x)**	39.84 mm	.84 mm	6 mm	100 mm	**V997000-X**	173.00
.1850	4.700 mm	.646	**16.40 mm**	**(3x)**	17.26 mm	.86 mm	6 mm	63 mm	**V846796-X**	62.50
.1850	4.700 mm	1.016	**25.80 mm**	**(5x)**	26.66 mm	.86 mm	6 mm	75 mm	**V824714-X**	77.50
.1850	4.700 mm	1.575	**40.00 mm**	**(8x)**	40.86 mm	.86 mm	6 mm	100 mm	**V896167-X**	173.00
.1875 (3/16)	4.762 mm	.654	**16.60 mm**	**(3x)**	17.47 mm	.87 mm	6 mm	63 mm	**V400615-X**	62.50
.1875 (3/16)	4.762 mm	1.032	**26.20 mm**	**(5x)**	27.07 mm	.87 mm	6 mm	75 mm	**V236564-X**	77.50
.1875 (3/16)	4.762 mm	1.591	**40.40 mm**	**(8x)**	41.27 mm	.87 mm	6 mm	100 mm	**V126929-X**	173.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.1890	4.800 mm	.661	**16.80 mm**	**(3x)**	17.67 mm	.87 mm	6 mm	63 mm	**V834057-X**	62.50
.1890	4.800 mm	1.039	**26.40 mm**	**(5x)**	27.27 mm	.87 mm	6 mm	75 mm	**V321709-X**	77.50
.1890	4.800 mm	1.606	**40.80 mm**	**(8x)**	41.67 mm	.87 mm	6 mm	100 mm	**V290220-X**	173.00
.1930	4.900 mm	.677	**17.20 mm**	**(3x)**	18.09 mm	.89 mm	6 mm	63 mm	**V745413-X**	62.50
.1930	4.900 mm	1.063	**27.00 mm**	**(5x)**	27.89 mm	.89 mm	6 mm	75 mm	**V381771-X**	77.50
.1930	4.900 mm	1.638	**41.60 mm**	**(8x)**	42.49 mm	.89 mm	6 mm	100 mm	**V449962-X**	173.00
.1968	5.000 mm	.693	**17.60 mm**	**(3x)**	18.51 mm	.91 mm	6 mm	63 mm	**V810779-X**	62.50
.1968	5.000 mm	1.087	**27.60 mm**	**(5x)**	28.51 mm	.91 mm	6 mm	75 mm	**V661786-X**	77.50
.1968	5.000 mm	1.677	**42.60 mm**	**(8x)**	43.51 mm	.91 mm	6 mm	100 mm	**V727149-X**	173.00
.2007	5.100 mm	.701	**17.80 mm**	**(3x)**	18.73 mm	.93 mm	6 mm	63 mm	**V558333-X**	62.50
.2007	5.100 mm	1.102	**28.00 mm**	**(5x)**	28.93 mm	.93 mm	6 mm	75 mm	**V683701-X**	77.50
.2007	5.100 mm	1.709	**43.40 mm**	**(8x)**	44.33 mm	.93 mm	6 mm	100 mm	**V445203-X**	173.00
.2031 (13/64)	5.159 mm	.709	**18.00 mm**	**(3x)**	18.94 mm	.94 mm	6 mm	63 mm	**V536622-X**	62.50
.2031 (13/64)	5.159 mm	1.118	**28.40 mm**	**(5x)**	29.34 mm	.94 mm	6 mm	75 mm	**V743431-X**	77.50
.2031 (13/64)	5.159 mm	1.724	**43.80 mm**	**(8x)**	44.74 mm	.94 mm	6 mm	100 mm	**V479533-X**	173.00
.2047	5.200 mm	.717	**18.20 mm**	**(3x)**	19.15 mm	.95 mm	6 mm	63 mm	**V603666-X**	62.50
.2047	5.200 mm	1.126	**28.60 mm**	**(5x)**	29.55 mm	.95 mm	6 mm	75 mm	**V663747-X**	77.50
.2047	5.200 mm	1.740	**44.20 mm**	**(8x)**	45.15 mm	.95 mm	6 mm	100 mm	**V984977-X**	173.00
.2086	5.300 mm	.732	**18.60 mm**	**(3x)**	19.56 mm	.96 mm	6 mm	63 mm	**V612145-X**	62.50
.2086	5.300 mm	1.150	**29.20 mm**	**(5x)**	30.16 mm	.96 mm	6 mm	75 mm	**V947811-X**	77.50
.2086	5.300 mm	1.772	**45.00 mm**	**(8x)**	45.96 mm	.96 mm	6 mm	100 mm	**V464644-X**	173.00
.2125	5.400 mm	.748	**19.00 mm**	**(3x)**	19.98 mm	.98 mm	6 mm	63 mm	**V103818-X**	62.50
.2125	5.400 mm	1.173	**29.80 mm**	**(5x)**	30.78 mm	.98 mm	6 mm	75 mm	**V231435-X**	77.50
.2125	5.400 mm	1.811	**46.00 mm**	**(8x)**	46.98 mm	.98 mm	6 mm	100 mm	**V848179-X**	173.00
.2165	5.500 mm	.756	**19.20 mm**	**(3x)**	20.20 mm	1.00 mm	6 mm	63 mm	**V245936-X**	62.50
.2165	5.500 mm	1.189	**30.20 mm**	**(5x)**	31.20 mm	1.00 mm	6 mm	75 mm	**V590469-X**	77.50
.2165	5.500 mm	1.843	**46.80 mm**	**(8x)**	47.80 mm	1.00 mm	6 mm	100 mm	**V881807-X**	173.00
.2187 (7/32)	5.556 mm	.764	**19.40 mm**	**(3x)**	20.41 mm	1.01 mm	6 mm	63 mm	**V412034-X**	62.50
.2187 (7/32)	5.556 mm	1.205	**30.60 mm**	**(5x)**	31.61 mm	1.01 mm	6 mm	75 mm	**V550391-X**	77.50
.2187 (7/32)	5.556 mm	1.858	**47.20 mm**	**(8x)**	48.21 mm	1.01 mm	6 mm	100 mm	**V682954-X**	173.00
.2205	5.600 mm	.772	**19.60 mm**	**(3x)**	20.62 mm	1.02 mm	6 mm	63 mm	**V869257-X**	62.50
.2205	5.600 mm	1.213	**30.80 mm**	**(5x)**	31.82 mm	1.02 mm	6 mm	75 mm	**V885614-X**	77.50
.2205	5.600 mm	1.874	**47.60 mm**	**(8x)**	48.62 mm	1.02 mm	6 mm	100 mm	**V372811-X**	173.00
.2244	5.700 mm	.787	**20.00 mm**	**(3x)**	21.04 mm	1.04 mm	6 mm	63 mm	**V911021-X**	62.50
.2244	5.700 mm	1.236	**31.40 mm**	**(5x)**	32.44 mm	1.04 mm	6 mm	75 mm	**V674875-X**	77.50
.2244	5.700 mm	1.906	**48.40 mm**	**(8x)**	49.44 mm	1.04 mm	6 mm	100 mm	**V885969-X**	173.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.2283	5.800 mm	.803	**20.40 mm**	**(3x)**	21.46 mm	1.06 mm	6 mm	63 mm	**V439914-X**	62.50
.2283	5.800 mm	1.252	**31.80 mm**	**(5x)**	32.86 mm	1.06 mm	6 mm	75 mm	**V260690-X**	77.50
.2283	5.800 mm	1.937	**49.20 mm**	**(8x)**	50.26 mm	1.06 mm	6 mm	100 mm	**V751036-X**	173.00
.2322	5.900 mm	.811	**20.60 mm**	**(3x)**	21.67 mm	1.07 mm	6 mm	63 mm	**V603655-X**	62.50
.2322	5.900 mm	1.276	**32.40 mm**	**(5x)**	33.47 mm	1.07 mm	6 mm	75 mm	**V519010-X**	77.50
.2322	5.900 mm	1.976	**50.20 mm**	**(8x)**	51.27 mm	1.07 mm	6 mm	100 mm	**V549472-X**	173.00
.2343 (15/64)	5.953 mm	.819	**20.80 mm**	**(3x)**	21.88 mm	1.08 mm	6 mm	63 mm	**V458998-X**	62.50
.2343 (15/64)	5.953 mm	1.291	**32.80 mm**	**(5x)**	33.88 mm	1.08 mm	6 mm	75 mm	**V623370-X**	77.50
.2343 (15/64)	5.953 mm	1.992	**50.60 mm**	**(8x)**	51.68 mm	1.08 mm	6 mm	100 mm	**V445403-X**	173.00
.2362	6.000 mm	.827	**21.00 mm**	**(3x)**	22.09 mm	1.09 mm	8 mm	75 mm	**V106008-X**	62.50
.2362	6.000 mm	1.299	**33.00 mm**	**(5x)**	34.09 mm	1.09 mm	8 mm	100 mm	**V170131-X**	77.50
.2362	6.000 mm	2.008	**51.00 mm**	**(8x)**	52.09 mm	1.09 mm	8 mm	125 mm	**V345369-X**	173.00
.2401	6.100 mm	.847	**21.50 mm**	**(3x)**	22.61 mm	1.11 mm	8 mm	75 mm	**V786634-X**	75.00
.2401	6.100 mm	1.319	**33.50 mm**	**(5x)**	34.61 mm	1.11 mm	8 mm	100 mm	**V638795-X**	89.50
.2401	6.100 mm	2.047	**52.00 mm**	**(8x)**	53.11 mm	1.11 mm	8 mm	125 mm	**V492775-X**	181.00
.2440	6.200 mm	.847	**21.50 mm**	**(3x)**	22.63 mm	1.13 mm	8 mm	75 mm	**V156414-X**	75.00
.2440	6.200 mm	1.339	**34.00 mm**	**(5x)**	35.13 mm	1.13 mm	8 mm	100 mm	**V246074-X**	89.50
.2440	6.200 mm	2.067	**52.50 mm**	**(8x)**	53.63 mm	1.13 mm	8 mm	125 mm	**V936607-X**	181.00
.2480	6.300 mm	.866	**22.00 mm**	**(3x)**	23.15 mm	1.15 mm	8 mm	75 mm	**V252509-X**	75.00
.2480	6.300 mm	1.358	**34.50 mm**	**(5x)**	35.65 mm	1.15 mm	8 mm	100 mm	**V349769-X**	89.50
.2480	6.300 mm	2.106	**53.50 mm**	**(8x)**	54.65 mm	1.15 mm	8 mm	125 mm	**V272919-X**	181.00
.2500 (1/4)	6.350 mm	.866	**22.00 mm**	**(3x)**	23.16 mm	1.16 mm	8 mm	75 mm	**V809169-X**	75.00
.2500 (1/4)	6.350 mm	1.378	**35.00 mm**	**(5x)**	36.16 mm	1.16 mm	8 mm	100 mm	**V715183-X**	89.50
.2500 (1/4)	6.350 mm	2.126	**54.00 mm**	**(8x)**	55.16 mm	1.16 mm	8 mm	125 mm	**V316828-X**	181.00
.2520	6.400 mm	.886	**22.50 mm**	**(3x)**	23.66 mm	1.16 mm	8 mm	75 mm	**V343209-X**	75.00
.2520	6.400 mm	1.378	**35.00 mm**	**(5x)**	36.16 mm	1.16 mm	8 mm	100 mm	**V664864-X**	89.50
.2520	6.400 mm	2.146	**54.50 mm**	**(8x)**	55.66 mm	1.16 mm	8 mm	125 mm	**V449441-X**	181.00

* For h6 and h8 tolerances, see page 8.

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Tech Tip

Select a material specific drill to avoid hole misalignment. Material specific drills are designed with geometries that will **mitigate the specific challenges** that each unique material presents.

High Performance Drills

For Steels (cont.)

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.2559	6.500 mm	.906	**23.00 mm**	**(3x)**	24.18 mm	1.18 mm	8 mm	75 mm	**V749006-X**	75.00
.2559	6.500 mm	1.417	**36.00 mm**	**(5x)**	37.18 mm	1.18 mm	8 mm	100 mm	**V976126-X**	89.50
.2559	6.500 mm	2.185	**55.50 mm**	**(8x)**	56.68 mm	1.18 mm	8 mm	125 mm	**V426083-X**	181.00
.2598	6.600 mm	.906	**23.00 mm**	**(3x)**	24.20 mm	1.20 mm	8 mm	75 mm	**V734311-X**	78.50
.2598	6.600 mm	1.437	**36.50 mm**	**(5x)**	37.70 mm	1.20 mm	8 mm	100 mm	**V321248-X**	92.50
.2598	6.600 mm	2.205	**56.00 mm**	**(8x)**	57.20 mm	1.20 mm	8 mm	125 mm	**V978161-X**	202.00
.2638	6.700 mm	.925	**23.50 mm**	**(3x)**	24.72 mm	1.22 mm	8 mm	75 mm	**V695757-X**	78.50
.2638	6.700 mm	1.457	**37.00 mm**	**(5x)**	38.22 mm	1.22 mm	8 mm	100 mm	**V609211-X**	92.50
.2638	6.700 mm	2.244	**57.00 mm**	**(8x)**	58.22 mm	1.22 mm	8 mm	125 mm	**V416647-X**	202.00
.2656 (17/64)	6.746 mm	.925	**23.50 mm**	**(3x)**	24.73 mm	1.23 mm	8 mm	75 mm	**V577636-X**	78.50
.2656 (17/64)	6.746 mm	1.457	**37.00 mm**	**(5x)**	38.23 mm	1.23 mm	8 mm	100 mm	**V734759-X**	92.50
.2656 (17/64)	6.746 mm	2.264	**57.50 mm**	**(8x)**	58.73 mm	1.23 mm	8 mm	125 mm	**V738825-X**	202.00
.2677	6.800 mm	.945	**24.00 mm**	**(3x)**	25.24 mm	1.24 mm	8 mm	75 mm	**V338596-X**	78.50
.2677	6.800 mm	1.476	**37.50 mm**	**(5x)**	38.74 mm	1.24 mm	8 mm	100 mm	**V913970-X**	92.50
.2677	6.800 mm	2.284	**58.00 mm**	**(8x)**	59.24 mm	1.24 mm	8 mm	125 mm	**V219307-X**	202.00
.2717	6.900 mm	.945	**24.00 mm**	**(3x)**	25.26 mm	1.26 mm	8 mm	75 mm	**V291064-X**	78.50
.2717	6.900 mm	1.496	**38.00 mm**	**(5x)**	39.26 mm	1.26 mm	8 mm	100 mm	**V531112-X**	92.50
.2717	6.900 mm	2.303	**58.50 mm**	**(8x)**	59.76 mm	1.26 mm	8 mm	125 mm	**V950623-X**	202.00
.2756	7.000 mm	.965	**24.50 mm**	**(3x)**	25.77 mm	1.27 mm	8 mm	75 mm	**V663641-X**	78.50
.2756	7.000 mm	1.516	**38.50 mm**	**(5x)**	39.77 mm	1.27 mm	8 mm	100 mm	**V410825-X**	92.50
.2756	7.000 mm	2.343	**59.50 mm**	**(8x)**	60.77 mm	1.27 mm	8 mm	125 mm	**V604383-X**	202.00
.2795	7.100 mm	.984	**25.00 mm**	**(3x)**	26.29 mm	1.29 mm	8 mm	75 mm	**V600397-X**	79.50
.2795	7.100 mm	1.535	**39.00 mm**	**(5x)**	40.29 mm	1.29 mm	8 mm	100 mm	**V637495-X**	97.50
.2795	7.100 mm	2.382	**60.50 mm**	**(8x)**	61.79 mm	1.29 mm	8 mm	125 mm	**V993349-X**	212.50
.2812 (9/32)	7.142 mm	.984	**25.00 mm**	**(3x)**	26.30 mm	1.30 mm	8 mm	75 mm	**V952277-X**	79.50
.2812 (9/32)	7.142 mm	1.555	**39.50 mm**	**(5x)**	40.80 mm	1.30 mm	8 mm	100 mm	**V425690-X**	97.50
.2812 (9/32)	7.142 mm	2.382	**60.50 mm**	**(8x)**	61.80 mm	1.30 mm	8 mm	125 mm	**V956378-X**	212.50
.2834	7.200 mm	.984	**25.00 mm**	**(3x)**	26.31 mm	1.31 mm	8 mm	75 mm	**V226899-X**	79.50
.2834	7.200 mm	1.555	**39.50 mm**	**(5x)**	40.81 mm	1.31 mm	8 mm	100 mm	**V657275-X**	97.50
.2834	7.200 mm	2.402	**61.00 mm**	**(8x)**	62.31 mm	1.31 mm	8 mm	125 mm	**V672970-X**	212.50
.2874	7.300 mm	1.004	**25.50 mm**	**(3x)**	26.83 mm	1.33 mm	8 mm	75 mm	**V653370-X**	79.50
.2874	7.300 mm	1.575	**40.00 mm**	**(5x)**	41.33 mm	1.33 mm	8 mm	100 mm	**V195918-X**	97.50
.2874	7.300 mm	2.441	**62.00 mm**	**(8x)**	63.33 mm	1.33 mm	8 mm	125 mm	**V727542-X**	212.50
.2913	7.400 mm	1.024	**26.00 mm**	**(3x)**	27.35 mm	1.35 mm	8 mm	75 mm	**V489342-X**	79.50
.2913	7.400 mm	1.595	**40.50 mm**	**(5x)**	41.85 mm	1.35 mm	8 mm	100 mm	**V795527-X**	97.50
.2913	7.400 mm	2.480	**63.00 mm**	**(8x)**	64.35 mm	1.35 mm	8 mm	125 mm	**V172694-X**	212.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.2952	7.500 mm	1.043	**26.50 mm**	**(3x)**	27.86 mm	1.36 mm	8 mm	75 mm	**V148315-X**	79.50
.2952	7.500 mm	1.634	**41.50 mm**	**(5x)**	42.86 mm	1.36 mm	8 mm	100 mm	**V103072-X**	97.50
.2952	7.500 mm	2.520	**64.00 mm**	**(8x)**	65.36 mm	1.36 mm	8 mm	125 mm	**V145153-X**	212.50
.2969 (19/64)	7.541 mm	1.043	**26.50 mm**	**(3x)**	27.87 mm	1.37 mm	8 mm	75 mm	**V285522-X**	79.50
.2969 (19/64)	7.541 mm	1.634	**41.50 mm**	**(5x)**	42.87 mm	1.37 mm	8 mm	100 mm	**V850668-X**	97.50
.2969 (19/64)	7.541 mm	2.520	**64.00 mm**	**(8x)**	65.37 mm	1.37 mm	8 mm	125 mm	**V781588-X**	212.50
.2992	7.600 mm	1.043	**26.50 mm**	**(3x)**	27.88 mm	1.38 mm	8 mm	75 mm	**V558243-X**	79.50
.2992	7.600 mm	1.654	**42.00 mm**	**(5x)**	43.38 mm	1.38 mm	8 mm	100 mm	**V707294-X**	97.50
.2992	7.600 mm	2.539	**64.50 mm**	**(8x)**	65.88 mm	1.38 mm	8 mm	125 mm	**V944678-X**	212.50
.3031	7.700 mm	1.063	**27.00 mm**	**(3x)**	28.40 mm	1.40 mm	8 mm	75 mm	**V515094-X**	79.50
.3031	7.700 mm	1.673	**42.50 mm**	**(5x)**	43.90 mm	1.40 mm	8 mm	100 mm	**V323536-X**	97.50
.3031	7.700 mm	2.579	**65.50 mm**	**(8x)**	66.90 mm	1.40 mm	8 mm	125 mm	**V316193-X**	212.50
.3071	7.800 mm	1.083	**27.50 mm**	**(3x)**	28.92 mm	1.42 mm	8 mm	75 mm	**V613783-X**	79.50
.3071	7.800 mm	1.693	**43.00 mm**	**(5x)**	44.42 mm	1.42 mm	8 mm	100 mm	**V225740-X**	97.50
.3071	7.800 mm	2.618	**66.50 mm**	**(8x)**	67.92 mm	1.42 mm	8 mm	125 mm	**V543502-X**	212.50
.3110	7.900 mm	1.083	**27.50 mm**	**(3x)**	28.94 mm	1.44 mm	8 mm	75 mm	**V643419-X**	79.50
.3110	7.900 mm	1.713	**43.50 mm**	**(5x)**	44.94 mm	1.44 mm	8 mm	100 mm	**V962384-X**	97.50
.3110	7.900 mm	2.638	**67.00 mm**	**(8x)**	68.44 mm	1.44 mm	8 mm	125 mm	**V199008-X**	212.50
.3125 (5/16)	7.937 mm	1.102	**28.00 mm**	**(3x)**	29.44 mm	1.44 mm	8 mm	75 mm	**V922027-X**	79.50
.3125 (5/16)	7.937 mm	1.713	**43.50 mm**	**(5x)**	44.94 mm	1.44 mm	8 mm	100 mm	**V962711-X**	97.50
.3125 (5/16)	7.937 mm	2.658	**67.50 mm**	**(8x)**	68.94 mm	1.44 mm	8 mm	125 mm	**V832006-X**	212.50
.3150	8.000 mm	1.102	**28.00 mm**	**(3x)**	29.46 mm	1.46 mm	10 mm	75 mm	**V437355-X**	79.50
.3150	8.000 mm	1.732	**44.00 mm**	**(5x)**	45.46 mm	1.46 mm	10 mm	100 mm	**V432969-X**	97.50
.3150	8.000 mm	2.677	**68.00 mm**	**(8x)**	69.46 mm	1.46 mm	10 mm	125 mm	**V414548-X**	212.50
.3189	8.100 mm	1.122	**28.50 mm**	**(3x)**	29.97 mm	1.47 mm	10 mm	75 mm	**V172150-X**	95.00
.3189	8.100 mm	1.752	**44.50 mm**	**(5x)**	45.97 mm	1.47 mm	10 mm	100 mm	**V805974-X**	108.50
.3189	8.100 mm	2.717	**69.00 mm**	**(8x)**	70.47 mm	1.47 mm	10 mm	125 mm	**V784040-X**	241.50
.3228	8.200 mm	1.122	**28.50 mm**	**(3x)**	29.99 mm	1.49 mm	10 mm	75 mm	**V104389-X**	95.00
.3228	8.200 mm	1.772	**45.00 mm**	**(5x)**	46.49 mm	1.49 mm	10 mm	100 mm	**V797513-X**	108.50
.3228	8.200 mm	2.736	**69.50 mm**	**(8x)**	70.99 mm	1.49 mm	10 mm	125 mm	**V889280-X**	241.50
.3268	8.300 mm	1.142	**29.00 mm**	**(3x)**	30.51 mm	1.51 mm	10 mm	75 mm	**V431404-X**	95.00
.3268	8.300 mm	1.791	**45.50 mm**	**(5x)**	47.01 mm	1.51 mm	10 mm	100 mm	**V464819-X**	108.50
.3268	8.300 mm	2.776	**70.50 mm**	**(8x)**	72.01 mm	1.51 mm	10 mm	125 mm	**V922989-X**	241.50
.3281 (21/64)	8.333 mm	1.142	**29.00 mm**	**(3x)**	30.52 mm	1.52 mm	10 mm	75 mm	**V729711-X**	95.00
.3281 (21/64)	8.333 mm	1.811	**46.00 mm**	**(5x)**	47.52 mm	1.52 mm	10 mm	100 mm	**V276452-X**	108.50
.3281 (21/64)	8.333 mm	2.795	**71.00 mm**	**(8x)**	72.52 mm	1.52 mm	10 mm	125 mm	**V423225-X**	241.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.3307	8.400 mm	1.161	**29.50 mm**	**(3x)**	31.03 mm	1.53 mm	10 mm	75 mm	**V846086-X**	95.00
.3307	8.400 mm	1.811	**46.00 mm**	**(5x)**	47.53 mm	1.53 mm	10 mm	100 mm	**V619529-X**	108.50
.3307	8.400 mm	2.815	**71.50 mm**	**(8x)**	73.03 mm	1.53 mm	10 mm	125 mm	**V772576-X**	241.50
.3346	8.500 mm	1.181	**30.00 mm**	**(3x)**	31.55 mm	1.55 mm	10 mm	75 mm	**V285498-X**	95.00
.3346	8.500 mm	1.850	**47.00 mm**	**(5x)**	48.55 mm	1.55 mm	10 mm	100 mm	**V767363-X**	108.50
.3346	8.500 mm	2.854	**72.50 mm**	**(8x)**	74.05 mm	1.55 mm	10 mm	125 mm	**V593996-X**	241.50
.3386	8.600 mm	1.181	**30.00 mm**	**(3x)**	31.57 mm	1.57 mm	10 mm	75 mm	**V333326-X**	95.00
.3386	8.600 mm	1.870	**47.50 mm**	**(5x)**	49.07 mm	1.57 mm	10 mm	100 mm	**V713312-X**	108.50
.3386	8.600 mm	2.874	**73.00 mm**	**(8x)**	74.57 mm	1.57 mm	10 mm	125 mm	**V627207-X**	241.50
.3425	8.700 mm	1.201	**30.50 mm**	**(3x)**	32.08 mm	1.58 mm	10 mm	75 mm	**V812806-X**	95.00
.3425	8.700 mm	1.890	**48.00 mm**	**(5x)**	49.58 mm	1.58 mm	10 mm	100 mm	**V322323-X**	108.50
.3425	8.700 mm	2.913	**74.00 mm**	**(8x)**	75.58 mm	1.58 mm	10 mm	125 mm	**V697981-X**	241.50
.3438 (11/32)	8.732 mm	1.201	**30.50 mm**	**(3x)**	32.09 mm	1.59 mm	10 mm	75 mm	**V270614-X**	95.00
.3438 (11/32)	8.732 mm	1.890	**48.00 mm**	**(5x)**	49.59 mm	1.59 mm	10 mm	100 mm	**V831670-X**	108.50
.3438 (11/32)	8.732 mm	2.913	**74.00 mm**	**(8x)**	75.59 mm	1.59 mm	10 mm	125 mm	**V867816-X**	241.50
.3465	8.800 mm	1.221	**31.00 mm**	**(3x)**	32.60 mm	1.60 mm	10 mm	75 mm	**V243786-X**	95.00
.3465	8.800 mm	1.909	**48.50 mm**	**(5x)**	50.10 mm	1.60 mm	10 mm	100 mm	**V523931-X**	108.50
.3465	8.800 mm	2.953	**75.00 mm**	**(8x)**	76.60 mm	1.60 mm	10 mm	125 mm	**V231271-X**	241.50
.3504	8.900 mm	1.221	**31.00 mm**	**(3x)**	32.62 mm	1.62 mm	10 mm	75 mm	**V978768-X**	95.00
.3504	8.900 mm	1.929	**49.00 mm**	**(5x)**	50.62 mm	1.62 mm	10 mm	100 mm	**V367699-X**	108.50
.3504	8.900 mm	2.972	**75.50 mm**	**(8x)**	77.12 mm	1.62 mm	10 mm	150 mm	**V699423-X**	241.50
.3543	9.000 mm	1.240	**31.50 mm**	**(3x)**	33.14 mm	1.64 mm	10 mm	75 mm	**V820250-X**	95.00
.3543	9.000 mm	1.949	**49.50 mm**	**(5x)**	51.14 mm	1.64 mm	10 mm	100 mm	**V605839-X**	108.50
.3543	9.000 mm	3.012	**76.50 mm**	**(8x)**	78.14 mm	1.64 mm	10 mm	150 mm	**V477581-X**	241.50
.3583	9.100 mm	1.260	**32.00 mm**	**(3x)**	33.66 mm	1.66 mm	10 mm	75 mm	**V926579-X**	101.00
.3583	9.100 mm	1.969	**50.00 mm**	**(5x)**	51.66 mm	1.66 mm	10 mm	100 mm	**V227340-X**	119.00
.3583	9.100 mm	3.051	**77.50 mm**	**(8x)**	79.16 mm	1.66 mm	10 mm	150 mm	**V387177-X**	254.50
.3594 (23/64)	9.128 mm	1.260	**32.00 mm**	**(3x)**	33.66 mm	1.66 mm	10 mm	75 mm	**V520702-X**	101.00
.3594 (23/64)	9.128 mm	1.969	**50.00 mm**	**(5x)**	51.66 mm	1.66 mm	10 mm	100 mm	**V831468-X**	119.00
.3594 (23/64)	9.128 mm	3.051	**77.50 mm**	**(8x)**	79.16 mm	1.66 mm	10 mm	150 mm	**V492754-X**	254.50
.3622	9.200 mm	1.260	**32.00 mm**	**(3x)**	33.67 mm	1.67 mm	10 mm	75 mm	**V861199-X**	101.00
.3622	9.200 mm	1.988	**50.50 mm**	**(5x)**	52.17 mm	1.67 mm	10 mm	100 mm	**V909379-X**	119.00
.3622	9.200 mm	3.071	**78.00 mm**	**(8x)**	79.67 mm	1.67 mm	10 mm	150 mm	**V273373-X**	254.50
.3661	9.300 mm	1.280	**32.50 mm**	**(3x)**	34.19 mm	1.69 mm	10 mm	75 mm	**V341438-X**	101.00
.3661	9.300 mm	2.008	**51.00 mm**	**(5x)**	52.69 mm	1.69 mm	10 mm	100 mm	**V750726-X**	119.00
.3661	9.300 mm	3.110	**79.00 mm**	**(8x)**	80.69 mm	1.69 mm	10 mm	150 mm	**V491242-X**	254.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.3701	9.400 mm	1.299	**33.00 mm**	**(3x)**	34.71 mm	1.71 mm	10 mm	75 mm	**V245183-X**	101.00
.3701	9.400 mm	2.028	**51.50 mm**	**(5x)**	53.21 mm	1.71 mm	10 mm	100 mm	**V773243-X**	119.00
.3701	9.400 mm	3.150	**80.00 mm**	**(8x)**	81.71 mm	1.71 mm	10 mm	150 mm	**V292278-X**	254.50
.3740	9.500 mm	1.319	**33.50 mm**	**(3x)**	35.23 mm	1.73 mm	10 mm	75 mm	**V368486-X**	101.00
.3740	9.500 mm	2.067	**52.50 mm**	**(5x)**	54.23 mm	1.73 mm	10 mm	100 mm	**V767819-X**	119.00
.3740	9.500 mm	3.189	**81.00 mm**	**(8x)**	82.73 mm	1.73 mm	10 mm	150 mm	**V982412-X**	254.50
.3750 (3/8)	9.525 mm	1.319	**33.50 mm**	**(3x)**	35.23 mm	1.73 mm	10 mm	75 mm	**V543634-X**	101.00
.3750 (3/8)	9.525 mm	2.067	**52.50 mm**	**(5x)**	54.23 mm	1.73 mm	10 mm	100 mm	**V294737-X**	119.00
.3750 (3/8)	9.525 mm	3.189	**81.00 mm**	**(8x)**	82.73 mm	1.73 mm	10 mm	150 mm	**V643720-X**	254.50
.3780	9.600 mm	1.319	**33.50 mm**	**(3x)**	35.25 mm	1.75 mm	10 mm	75 mm	**V558947-X**	101.00
.3780	9.600 mm	2.087	**53.00 mm**	**(5x)**	54.75 mm	1.75 mm	10 mm	100 mm	**V407796-X**	119.00
.3780	9.600 mm	3.209	**81.50 mm**	**(8x)**	83.25 mm	1.75 mm	10 mm	150 mm	**V407240-X**	254.50
.3819	9.700 mm	1.339	**34.00 mm**	**(3x)**	35.77 mm	1.77 mm	10 mm	75 mm	**V934556-X**	101.00
.3819	9.700 mm	2.106	**53.50 mm**	**(5x)**	55.27 mm	1.77 mm	10 mm	100 mm	**V538795-X**	119.00
.3819	9.700 mm	3.248	**82.50 mm**	**(8x)**	84.27 mm	1.77 mm	10 mm	150 mm	**V417626-X**	254.50
.3858	9.800 mm	1.358	**34.50 mm**	**(3x)**	36.28 mm	1.78 mm	10 mm	75 mm	**V229427-X**	101.00
.3858	9.800 mm	2.126	**54.00 mm**	**(5x)**	55.78 mm	1.78 mm	10 mm	100 mm	**V750562-X**	119.00
.3858	9.800 mm	3.287	**83.50 mm**	**(8x)**	85.28 mm	1.78 mm	10 mm	150 mm	**V797339-X**	254.50
.3898	9.900 mm	1.358	**34.50 mm**	**(3x)**	36.30 mm	1.80 mm	10 mm	75 mm	**V869506-X**	101.00
.3898	9.900 mm	2.146	**54.50 mm**	**(5x)**	56.30 mm	1.80 mm	10 mm	100 mm	**V429736-X**	119.00
.3898	9.900 mm	3.307	**84.00 mm**	**(8x)**	85.80 mm	1.80 mm	10 mm	150 mm	**V304892-X**	254.50
.3906 (25/64)	9.921 mm	1.358	**34.50 mm**	**(3x)**	36.31 mm	1.81 mm	10 mm	75 mm	**V612861-X**	101.00
.3906 (25/64)	9.921 mm	2.146	**54.50 mm**	**(5x)**	56.31 mm	1.81 mm	10 mm	100 mm	**V804543-X**	119.00
.3906 (25/64)	9.921 mm	3.327	**84.50 mm**	**(8x)**	86.31 mm	1.81 mm	10 mm	150 mm	**V656076-X**	254.50
.3937	10.000 mm	1.378	**35.00 mm**	**(3x)**	36.82 mm	1.82 mm	12 mm	100 mm	**V562092-X**	101.00
.3937	10.000 mm	2.165	**55.00 mm**	**(5x)**	56.82 mm	1.82 mm	12 mm	125 mm	**V550034-X**	119.00
.3937	10.000 mm	3.347	**85.00 mm**	**(8x)**	86.82 mm	1.82 mm	12 mm	150 mm	**V834651-X**	254.50
.3976	10.100 mm	1.398	**35.50 mm**	**(3x)**	37.34 mm	1.84 mm	12 mm	100 mm	**V297691-X**	136.00
.3976	10.100 mm	2.185	**55.50 mm**	**(5x)**	57.34 mm	1.84 mm	12 mm	125 mm	**V717095-X**	158.00
.3976	10.100 mm	3.386	**86.00 mm**	**(8x)**	87.84 mm	1.84 mm	12 mm	150 mm	**V946266-X**	331.00
.4016	10.200 mm	1.398	**35.50 mm**	**(3x)**	37.36 mm	1.86 mm	12 mm	100 mm	**V829282-X**	136.00
.4016	10.200 mm	2.205	**56.00 mm**	**(5x)**	57.86 mm	1.86 mm	12 mm	125 mm	**V905204-X**	158.00
.4016	10.200 mm	3.406	**86.50 mm**	**(8x)**	88.36 mm	1.86 mm	12 mm	150 mm	**V984655-X**	331.00
.4055	10.300 mm	1.417	**36.00 mm**	**(3x)**	37.87 mm	1.87 mm	12 mm	100 mm	**V755643-X**	136.00
.4055	10.300 mm	2.224	**56.50 mm**	**(5x)**	58.37 mm	1.87 mm	12 mm	125 mm	**V473326-X**	158.00
.4055	10.300 mm	3.445	**87.50 mm**	**(8x)**	89.37 mm	1.87 mm	12 mm	150 mm	**V319140-X**	331.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.4062 (13/32)	10.317 mm	1.417	**36.00 mm**	**(3x)**	37.88 mm	1.88 mm	12 mm	100 mm	**V558064-X**	136.00
.4062 (13/32)	10.317 mm	2.224	**56.50 mm**	**(5x)**	58.38 mm	1.88 mm	12 mm	125 mm	**V617000-X**	158.00
.4062 (13/32)	10.317 mm	3.445	**87.50 mm**	**(8x)**	89.38 mm	1.88 mm	12 mm	150 mm	**V184156-X**	331.00
.4094	10.400 mm	1.437	**36.50 mm**	**(3x)**	38.39 mm	1.89 mm	12 mm	100 mm	**V476483-X**	136.00
.4094	10.400 mm	2.244	**57.00 mm**	**(5x)**	58.89 mm	1.89 mm	12 mm	125 mm	**V872922-X**	158.00
.4094	10.400 mm	3.484	**88.50 mm**	**(8x)**	90.39 mm	1.89 mm	12 mm	150 mm	**V997876-X**	331.00
.4134	10.500 mm	1.457	**37.00 mm**	**(3x)**	38.91 mm	1.91 mm	12 mm	100 mm	**V804705-X**	136.00
.4134	10.500 mm	2.284	**58.00 mm**	**(5x)**	59.91 mm	1.91 mm	12 mm	125 mm	**V656863-X**	158.00
.4134	10.500 mm	3.524	**89.50 mm**	**(8x)**	91.41 mm	1.91 mm	12 mm	150 mm	**V959781-X**	331.00
.4173	10.600 mm	1.457	**37.00 mm**	**(3x)**	38.93 mm	1.93 mm	12 mm	100 mm	**V716473-X**	136.00
.4173	10.600 mm	2.303	**58.50 mm**	**(5x)**	60.43 mm	1.93 mm	12 mm	125 mm	**V931959-X**	158.00
.4173	10.600 mm	3.543	**90.00 mm**	**(8x)**	91.93 mm	1.93 mm	12 mm	150 mm	**V589985-X**	331.00
.4213	10.700 mm	1.476	**37.50 mm**	**(3x)**	39.45 mm	1.95 mm	12 mm	100 mm	**V967963-X**	136.00
.4213	10.700 mm	2.323	**59.00 mm**	**(5x)**	60.95 mm	1.95 mm	12 mm	125 mm	**V260341-X**	158.00
.4213	10.700 mm	3.583	**91.00 mm**	**(8x)**	92.95 mm	1.95 mm	12 mm	150 mm	**V317299-X**	331.00
.4219 (27/64)	10.716 mm	1.476	**37.50 mm**	**(3x)**	39.45 mm	1.95 mm	12 mm	100 mm	**V248338-X**	136.00
.4219 (27/64)	10.716 mm	2.323	**59.00 mm**	**(5x)**	60.95 mm	1.95 mm	12 mm	125 mm	**V184802-X**	158.00
.4219 (27/64)	10.716 mm	3.583	**91.00 mm**	**(8x)**	92.95 mm	1.95 mm	12 mm	150 mm	**V459907-X**	331.00
.4252	10.800 mm	1.496	**38.00 mm**	**(3x)**	39.97 mm	1.97 mm	12 mm	100 mm	**V602726-X**	136.00
.4252	10.800 mm	2.343	**59.50 mm**	**(5x)**	61.47 mm	1.97 mm	12 mm	125 mm	**V247731-X**	158.00
.4252	10.800 mm	3.622	**92.00 mm**	**(8x)**	93.97 mm	1.97 mm	12 mm	150 mm	**V195896-X**	331.00
.4291	10.900 mm	1.496	**38.00 mm**	**(3x)**	39.98 mm	1.98 mm	12 mm	100 mm	**V429098-X**	136.00
.4291	10.900 mm	2.362	**60.00 mm**	**(5x)**	61.98 mm	1.98 mm	12 mm	125 mm	**V561591-X**	158.00
.4291	10.900 mm	3.642	**92.50 mm**	**(8x)**	94.48 mm	1.98 mm	12 mm	175 mm	**V726450-X**	331.00
.4331	11.000 mm	1.516	**38.50 mm**	**(3x)**	40.50 mm	2.00 mm	12 mm	100 mm	**V661693-X**	136.00
.4331	11.000 mm	2.382	**60.50 mm**	**(5x)**	62.50 mm	2.00 mm	12 mm	125 mm	**V111557-X**	158.00
.4331	11.000 mm	3.681	**93.50 mm**	**(8x)**	95.50 mm	2.00 mm	12 mm	175 mm	**V731416-X**	331.00
.4370	11.100 mm	1.535	**39.00 mm**	**(3x)**	41.02 mm	2.02 mm	12 mm	100 mm	**V144905-X**	136.00
.4370	11.100 mm	2.402	**61.00 mm**	**(5x)**	63.02 mm	2.02 mm	12 mm	125 mm	**V529674-X**	158.00
.4370	11.100 mm	3.721	**94.50 mm**	**(8x)**	96.52 mm	2.02 mm	12 mm	175 mm	**V768753-X**	331.00
.4375 (7/16)	11.112 mm	1.535	**39.00 mm**	**(3x)**	41.02 mm	2.02 mm	12 mm	100 mm	**V538378-X**	136.00
.4375 (7/16)	11.112 mm	2.402	**61.00 mm**	**(5x)**	63.02 mm	2.02 mm	12 mm	125 mm	**V533490-X**	158.00
.4375 (7/16)	11.112 mm	3.721	**94.50 mm**	**(8x)**	96.52 mm	2.02 mm	12 mm	175 mm	**V652629-X**	331.00
.4409	11.200 mm	1.535	**39.00 mm**	**(3x)**	41.04 mm	2.04 mm	12 mm	100 mm	**V543531-X**	136.00
.4409	11.200 mm	2.421	**61.50 mm**	**(5x)**	63.54 mm	2.04 mm	12 mm	125 mm	**V266717-X**	158.00
.4409	11.200 mm	3.740	**95.00 mm**	**(8x)**	97.04 mm	2.04 mm	12 mm	175 mm	**V188910-X**	331.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.4449	11.300 mm	1.555	**39.50 mm**	**(3x)**	41.56 mm	2.06 mm	12 mm	100 mm	**V312875-X**	136.00
.4449	11.300 mm	2.441	**62.00 mm**	**(5x)**	64.06 mm	2.06 mm	12 mm	125 mm	**V579778-X**	158.00
.4449	11.300 mm	3.780	**96.00 mm**	**(8x)**	98.06 mm	2.06 mm	12 mm	175 mm	**V774245-X**	331.00
.4488	11.400 mm	1.575	**40.00 mm**	**(3x)**	42.07 mm	2.07 mm	12 mm	100 mm	**V650650-X**	136.00
.4488	11.400 mm	2.461	**62.50 mm**	**(5x)**	64.57 mm	2.07 mm	12 mm	125 mm	**V156993-X**	158.00
.4488	11.400 mm	3.819	**97.00 mm**	**(8x)**	99.07 mm	2.07 mm	12 mm	175 mm	**V872208-X**	331.00
.4527	11.500 mm	1.595	**40.50 mm**	**(3x)**	42.59 mm	2.09 mm	12 mm	100 mm	**V607294-X**	136.00
.4527	11.500 mm	2.500	**63.50 mm**	**(5x)**	65.59 mm	2.09 mm	12 mm	125 mm	**V663745-X**	158.00
.4527	11.500 mm	3.858	**98.00 mm**	**(8x)**	100.09 mm	2.09 mm	12 mm	175 mm	**V212865-X**	331.00
.4531 (29/64)	11.508 mm	1.595	**40.50 mm**	**(3x)**	42.59 mm	2.09 mm	12 mm	100 mm	**V564439-X**	136.00
.4531 (29/64)	11.508 mm	2.500	**63.50 mm**	**(5x)**	65.59 mm	2.09 mm	12 mm	125 mm	**V709414-X**	158.00
.4531 (29/64)	11.508 mm	3.858	**98.00 mm**	**(8x)**	100.09 mm	2.09 mm	12 mm	175 mm	**V208966-X**	331.00
.4567	11.600 mm	1.595	**40.50 mm**	**(3x)**	42.61 mm	2.11 mm	12 mm	100 mm	**V810836-X**	142.50
.4567	11.600 mm	2.520	**64.00 mm**	**(5x)**	66.11 mm	2.11 mm	12 mm	125 mm	**V824629-X**	164.00
.4567	11.600 mm	3.878	**98.50 mm**	**(8x)**	100.61 mm	2.11 mm	12 mm	175 mm	**V358116-X**	331.00
.4606	11.700 mm	1.614	**41.00 mm**	**(3x)**	43.13 mm	2.13 mm	12 mm	100 mm	**V125838-X**	142.50
.4606	11.700 mm	2.539	**64.50 mm**	**(5x)**	66.63 mm	2.13 mm	12 mm	125 mm	**V958629-X**	164.00
.4606	11.700 mm	3.917	**99.50 mm**	**(8x)**	101.63 mm	2.13 mm	12 mm	175 mm	**V540924-X**	331.00
.4646	11.800 mm	1.634	**41.50 mm**	**(3x)**	43.65 mm	2.15 mm	12 mm	100 mm	**V594549-X**	142.50
.4646	11.800 mm	2.559	**65.00 mm**	**(5x)**	67.15 mm	2.15 mm	12 mm	125 mm	**V537993-X**	164.00
.4646	11.800 mm	3.957	**100.50 mm**	**(8x)**	102.65 mm	2.15 mm	12 mm	175 mm	**V956277-X**	331.00
.4685	11.900 mm	1.634	**41.50 mm**	**(3x)**	43.67 mm	2.17 mm	12 mm	100 mm	**V683774-X**	142.50
.4685	11.900 mm	2.579	**65.50 mm**	**(5x)**	67.67 mm	2.17 mm	12 mm	125 mm	**V603568-X**	164.00
.4685	11.900 mm	3.976	**101.00 mm**	**(8x)**	103.17 mm	2.17 mm	12 mm	175 mm	**V902085-X**	331.00
.4688 (15/32)	11.907 mm	1.634	**41.50 mm**	**(3x)**	43.67 mm	2.17 mm	12 mm	100 mm	**V354466-X**	142.50
.4688 (15/32)	11.907 mm	2.579	**65.50 mm**	**(5x)**	67.67 mm	2.17 mm	12 mm	125 mm	**V650664-X**	164.00
.4688 (15/32)	11.907 mm	3.976	**101.00 mm**	**(8x)**	103.17 mm	2.17 mm	12 mm	175 mm	**V230482-X**	331.00
.4724	12.000 mm	1.654	**42.00 mm**	**(3x)**	44.18 mm	2.18 mm	14 mm	100 mm	**V447728-X**	142.50
.4724	12.000 mm	2.598	**66.00 mm**	**(5x)**	68.18 mm	2.18 mm	14 mm	125 mm	**V524845-X**	164.00
.4724	12.000 mm	4.016	**102.00 mm**	**(8x)**	104.18 mm	2.18 mm	14 mm	175 mm	**V955704-X**	331.00
.4764	12.100 mm	1.673	**42.50 mm**	**(3x)**	44.70 mm	2.20 mm	14 mm	100 mm	**V663610-X**	184.00
.4764	12.100 mm	2.618	**66.50 mm**	**(5x)**	68.70 mm	2.20 mm	14 mm	125 mm	**V879285-X**	214.00
.4764	12.100 mm	4.055	**103.00 mm**	**(8x)**	105.20 mm	2.20 mm	14 mm	175 mm	**V329060-X**	352.00
.4803	12.200 mm	1.673	**42.50 mm**	**(3x)**	44.72 mm	2.22 mm	14 mm	100 mm	**V818824-X**	184.00
.4803	12.200 mm	2.638	**67.00 mm**	**(5x)**	69.22 mm	2.22 mm	14 mm	125 mm	**V602362-X**	214.00
.4803	12.200 mm	4.075	**103.50 mm**	**(8x)**	105.72 mm	2.22 mm	14 mm	175 mm	**V342029-X**	352.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels (cont.)

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Drill Diameter inch	Drill Diameter metric	Max Drill Depth inch	Max Drill Depth metric	Max Drill Depth hole depth	Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated Tool #	Val-Max X Coated Price
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1		
.4843	12.300 mm	1.693	**43.00 mm**	**(3x)**	45.24 mm	2.24 mm	14 mm	100 mm	**V771146-X**	184.00
.4843	12.300 mm	2.658	**67.50 mm**	**(5x)**	69.74 mm	2.24 mm	14 mm	125 mm	**V286389-X**	214.00
.4843	12.300 mm	4.114	**104.50 mm**	**(8x)**	106.74 mm	2.24 mm	14 mm	175 mm	**V673379-X**	352.00
.4882 (31/64)	12.400 mm	1.713	**43.50 mm**	**(3x)**	45.76 mm	2.26 mm	14 mm	100 mm	**V790461-X**	184.00
.4882 (31/64)	12.400 mm	2.677	**68.00 mm**	**(5x)**	70.26 mm	2.26 mm	14 mm	125 mm	**V930755-X**	214.00
.4882 (31/64)	12.400 mm	4.154	**105.50 mm**	**(8x)**	107.76 mm	2.26 mm	14 mm	175 mm	**V997694-X**	352.00
.4921	12.500 mm	1.732	**44.00 mm**	**(3x)**	46.27 mm	2.27 mm	14 mm	100 mm	**V202412-X**	184.00
.4921	12.500 mm	2.717	**69.00 mm**	**(5x)**	71.27 mm	2.27 mm	14 mm	125 mm	**V131343-X**	214.00
.4921	12.500 mm	4.193	**106.50 mm**	**(8x)**	108.77 mm	2.27 mm	14 mm	175 mm	**V668048-X**	352.00
.4961	12.600 mm	1.732	**44.00 mm**	**(3x)**	46.29 mm	2.29 mm	14 mm	100 mm	**V369910-X**	184.00
.4961	12.600 mm	2.736	**69.50 mm**	**(5x)**	71.79 mm	2.29 mm	14 mm	125 mm	**V981463-X**	214.00
.4961	12.600 mm	4.213	**107.00 mm**	**(8x)**	109.29 mm	2.29 mm	14 mm	175 mm	**V682916-X**	352.00
.5000 (1/2)	12.700 mm	1.752	**44.50 mm**	**(3x)**	46.81 mm	2.31 mm	14 mm	100 mm	**V608930-X**	184.00
.5000 (1/2)	12.700 mm	2.756	**70.00 mm**	**(5x)**	72.31 mm	2.31 mm	14 mm	125 mm	**V915134-X**	214.00
.5000 (1/2)	12.700 mm	4.252	**108.00 mm**	**(8x)**	110.31 mm	2.31 mm	14 mm	175 mm	**V703694-X**	352.00

* For h6 and h8 tolerances, see page 8.

Double margin design for increased stability

High Performance Drills

For Steels – Coolant-Through

Unbeatable Performance When Coolant-Through Drilling 4140 Steel

- Optimized for best-in-class performance in 4140 Steel with superior performance in a wide variety of Steels and other Alloy Steels
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- 140° point angle with 4-facet geometry for improved self-centering
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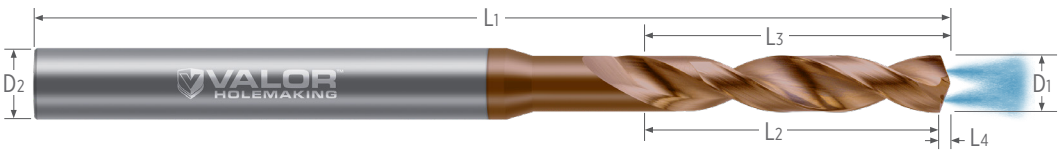
- h6 shank tolerance for high precision tool holders
- Solid carbide



Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.0625 (1/16)	1.587 mm	.343	**8.70 mm**	**(5x)**	8.99 mm	.29 mm	3 mm	63 mm	**V189491-X**	104.50
.0625 (1/16)	1.587 mm	.532	**13.50 mm**	**(8x)**	13.79 mm	.29 mm	3 mm	63 mm	**V709480-X**	184.00
.0630	1.600 mm	.347	**8.80 mm**	**(5x)**	9.09 mm	.29 mm	3 mm	63 mm	**V231543-X**	104.50
.0630	1.600 mm	.535	**13.60 mm**	**(8x)**	13.89 mm	.29 mm	3 mm	63 mm	**V886196-X**	184.00
.0669	1.700 mm	.366	**9.30 mm**	**(5x)**	9.61 mm	.31 mm	3 mm	63 mm	**V282030-X**	104.50
.0669	1.700 mm	.567	**14.40 mm**	**(8x)**	14.71 mm	.31 mm	3 mm	63 mm	**V538281-X**	184.00
.0708	1.800 mm	.390	**9.90 mm**	**(5x)**	10.23 mm	.33 mm	3 mm	63 mm	**V148595-X**	104.50
.0708	1.800 mm	.602	**15.30 mm**	**(8x)**	15.63 mm	.33 mm	3 mm	63 mm	**V604910-X**	184.00
.0748	1.900 mm	.409	**10.40 mm**	**(5x)**	10.75 mm	.35 mm	3 mm	63 mm	**V525056-X**	104.50
.0748	1.900 mm	.634	**16.10 mm**	**(8x)**	16.45 mm	.35 mm	3 mm	63 mm	**V766740-X**	184.00
.0781 (5/64)	1.984 mm	.429	**10.90 mm**	**(5x)**	11.26 mm	.36 mm	3 mm	63 mm	**V622465-X**	104.50
.0781 (5/64)	1.984 mm	.665	**16.90 mm**	**(8x)**	17.26 mm	.36 mm	3 mm	63 mm	**V830353-X**	184.00
.0787	2.000 mm	.433	**11.00 mm**	**(5x)**	11.36 mm	.36 mm	3 mm	63 mm	**V995928-X**	104.50
.0787	2.000 mm	.669	**17.00 mm**	**(8x)**	17.36 mm	.36 mm	3 mm	63 mm	**V475077-X**	184.00

* For h6 and h8 tolerances, see page 8.

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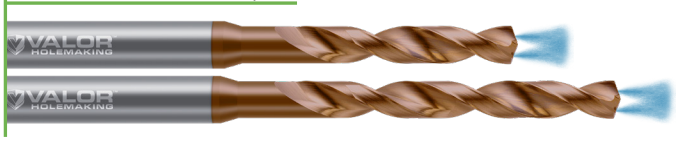
Stocked in 5x and 8x hole depths



High Performance Drills

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.0826	2.100 mm	.457	**11.60 mm**	**(5x)**	11.98 mm	.38 mm	3 mm	63 mm	**V507543-X**	104.50
.0826	2.100 mm	.705	**17.90 mm**	**(8x)**	18.28 mm	.38 mm	3 mm	63 mm	**V870311-X**	184.00
.0866	2.200 mm	.476	**12.10 mm**	**(5x)**	12.50 mm	.40 mm	3 mm	63 mm	**V344957-X**	104.50
.0866	2.200 mm	.736	**18.70 mm**	**(8x)**	19.10 mm	.40 mm	3 mm	63 mm	**V324289-X**	184.00
.0905	2.300 mm	.496	**12.60 mm**	**(5x)**	13.02 mm	.42 mm	3 mm	63 mm	**V869740-X**	104.50
.0905	2.300 mm	.768	**19.50 mm**	**(8x)**	19.92 mm	.42 mm	3 mm	63 mm	**V742025-X**	184.00
.0937 (3/32)	2.381 mm	.516	**13.10 mm**	**(5x)**	13.53 mm	.43 mm	3 mm	63 mm	**V941421-X**	104.50
.0937 (3/32)	2.381 mm	.795	**20.20 mm**	**(8x)**	20.63 mm	.43 mm	3 mm	63 mm	**V250208-X**	184.00
.0944	2.400 mm	.520	**13.20 mm**	**(5x)**	13.64 mm	.44 mm	3 mm	63 mm	**V307669-X**	104.50
.0944	2.400 mm	.803	**20.40 mm**	**(8x)**	20.84 mm	.44 mm	3 mm	63 mm	**V518131-X**	184.00
.0984	2.500 mm	.543	**13.80 mm**	**(5x)**	14.25 mm	.45 mm	3 mm	63 mm	**V539575-X**	104.50
.0984	2.500 mm	.839	**21.30 mm**	**(8x)**	21.75 mm	.45 mm	3 mm	63 mm	**V411727-X**	184.00
.1023	2.600 mm	.563	**14.30 mm**	**(5x)**	14.77 mm	.47 mm	3 mm	63 mm	**V216770-X**	104.50
.1023	2.600 mm	.870	**22.10 mm**	**(8x)**	22.57 mm	.47 mm	3 mm	63 mm	**V895404-X**	184.00
.1062	2.700 mm	.587	**14.90 mm**	**(5x)**	15.39 mm	.49 mm	3 mm	63 mm	**V324255-X**	104.50
.1062	2.700 mm	.906	**23.00 mm**	**(8x)**	23.49 mm	.49 mm	3 mm	63 mm	**V455663-X**	184.00
.1093 (7/64)	2.778 mm	.602	**15.30 mm**	**(5x)**	15.81 mm	.51 mm	3 mm	63 mm	**V247870-X**	104.50
.1093 (7/64)	2.778 mm	.929	**23.60 mm**	**(8x)**	24.11 mm	.51 mm	3 mm	63 mm	**V484388-X**	184.00
.1102	2.800 mm	.606	**15.40 mm**	**(5x)**	15.91 mm	.51 mm	3 mm	63 mm	**V406948-X**	104.50
.1102	2.800 mm	.937	**23.80 mm**	**(8x)**	24.31 mm	.51 mm	3 mm	63 mm	**V580945-X**	184.00
.1141	2.900 mm	.626	**15.90 mm**	**(5x)**	16.43 mm	.53 mm	3 mm	63 mm	**V401097-X**	104.50
.1141	2.900 mm	.969	**24.60 mm**	**(8x)**	25.13 mm	.53 mm	3 mm	63 mm	**V463539-X**	184.00
.1181	3.000 mm	.654	**16.60 mm**	**(5x)**	17.15 mm	.55 mm	4 mm	63 mm	**V801593-X**	104.50
.1181	3.000 mm	1.008	**25.60 mm**	**(8x)**	26.15 mm	.55 mm	4 mm	75 mm	**V457776-X**	184.00
.1220	3.100 mm	.669	**17.00 mm**	**(5x)**	17.56 mm	.56 mm	4 mm	63 mm	**V364491-X**	104.50
.1220	3.100 mm	1.039	**26.40 mm**	**(8x)**	26.96 mm	.56 mm	4 mm	75 mm	**V220312-X**	184.00
.1250 (1/8)	3.175 mm	.685	**17.40 mm**	**(5x)**	17.98 mm	.58 mm	4 mm	63 mm	**V809756-X**	104.50
.1250 (1/8)	3.175 mm	1.063	**27.00 mm**	**(8x)**	27.58 mm	.58 mm	4 mm	75 mm	**V996102-X**	184.00
.1260	3.200 mm	.693	**17.60 mm**	**(5x)**	18.18 mm	.58 mm	4 mm	63 mm	**V416396-X**	104.50
.1260	3.200 mm	1.071	**27.20 mm**	**(8x)**	27.78 mm	.58 mm	4 mm	75 mm	**V674784-X**	184.00
.1300	3.300 mm	.717	**18.20 mm**	**(5x)**	18.80 mm	.60 mm	4 mm	63 mm	**V512932-X**	104.50
.1300	3.300 mm	1.102	**28.00 mm**	**(8x)**	28.60 mm	.60 mm	4 mm	75 mm	**V397319-X**	184.00
.1338	3.400 mm	.732	**18.60 mm**	**(5x)**	19.22 mm	.62 mm	4 mm	63 mm	**V618699-X**	104.50
.1338	3.400 mm	1.134	**28.80 mm**	**(8x)**	29.42 mm	.62 mm	4 mm	75 mm	**V677203-X**	184.00
.1377	3.500 mm	.756	**19.20 mm**	**(5x)**	19.84 mm	.64 mm	4 mm	63 mm	**V270510-X**	104.50
.1377	3.500 mm	1.173	**29.80 mm**	**(8x)**	30.44 mm	.64 mm	4 mm	75 mm	**V173165-X**	184.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.1406 (9/64)	3.571 mm	.772	**19.60 mm**	**(5x)**	20.25 mm	.65 mm	4 mm	63 mm	**V431644-X**	104.50
.1406 (9/64)	3.571 mm	1.197	**30.40 mm**	**(8x)**	31.05 mm	.65 mm	4 mm	75 mm	**V576472-X**	184.00
.1417	3.600 mm	.780	**19.80 mm**	**(5x)**	20.46 mm	.66 mm	4 mm	63 mm	**V818634-X**	104.50
.1417	3.600 mm	1.205	**30.60 mm**	**(8x)**	31.26 mm	.66 mm	4 mm	75 mm	**V855115-X**	184.00
.1456	3.700 mm	.803	**20.40 mm**	**(5x)**	21.07 mm	.67 mm	4 mm	63 mm	**V800060-X**	104.50
.1456	3.700 mm	1.236	**31.40 mm**	**(8x)**	32.07 mm	.67 mm	4 mm	75 mm	**V947623-X**	184.00
.1496	3.800 mm	.819	**20.80 mm**	**(5x)**	21.49 mm	.69 mm	4 mm	63 mm	**V598062-X**	104.50
.1496	3.800 mm	1.268	**32.20 mm**	**(8x)**	32.89 mm	.69 mm	4 mm	75 mm	**V264988-X**	184.00
.1535	3.900 mm	.843	**21.40 mm**	**(5x)**	22.11 mm	.71 mm	4 mm	63 mm	**V853122-X**	104.50
.1535	3.900 mm	1.307	**33.20 mm**	**(8x)**	33.91 mm	.71 mm	4 mm	75 mm	**V704607-X**	184.00
.1562 (5/32)	3.968 mm	.858	**21.80 mm**	**(5x)**	22.52 mm	.72 mm	4 mm	63 mm	**V635360-X**	104.50
.1562 (5/32)	3.968 mm	1.331	**33.80 mm**	**(8x)**	34.52 mm	.72 mm	4 mm	75 mm	**V976984-X**	184.00
.1574	4.000 mm	.866	**22.00 mm**	**(5x)**	22.73 mm	.73 mm	6 mm	75 mm	**V203097-X**	114.00
.1574	4.000 mm	1.339	**34.00 mm**	**(8x)**	34.73 mm	.73 mm	6 mm	100 mm	**V976894-X**	188.50
.1614	4.100 mm	.890	**22.60 mm**	**(5x)**	23.35 mm	.75 mm	6 mm	75 mm	**V123430-X**	114.00
.1614	4.100 mm	1.370	**34.80 mm**	**(8x)**	35.55 mm	.75 mm	6 mm	100 mm	**V852607-X**	188.50
.1653	4.200 mm	.913	**23.20 mm**	**(5x)**	23.96 mm	.76 mm	6 mm	75 mm	**V565742-X**	114.00
.1653	4.200 mm	1.409	**35.80 mm**	**(8x)**	36.56 mm	.76 mm	6 mm	100 mm	**V251176-X**	188.50
.1692	4.300 mm	.929	**23.60 mm**	**(5x)**	24.38 mm	.78 mm	6 mm	75 mm	**V726600-X**	114.00
.1692	4.300 mm	1.441	**36.60 mm**	**(8x)**	37.38 mm	.78 mm	6 mm	100 mm	**V898991-X**	188.50
.1718 (11/64)	4.365 mm	.945	**24.00 mm**	**(5x)**	24.79 mm	.79 mm	6 mm	75 mm	**V599958-X**	114.00
.1718 (11/64)	4.365 mm	1.465	**37.20 mm**	**(8x)**	37.99 mm	.79 mm	6 mm	100 mm	**V939471-X**	188.50
.1732	4.400 mm	.953	**24.20 mm**	**(5x)**	25.00 mm	.80 mm	6 mm	75 mm	**V910547-X**	114.00
.1732	4.400 mm	1.472	**37.40 mm**	**(8x)**	38.20 mm	.80 mm	6 mm	100 mm	**V336021-X**	188.50
.1771	4.500 mm	.976	**24.80 mm**	**(5x)**	25.62 mm	.82 mm	6 mm	75 mm	**V953328-X**	114.00
.1771	4.500 mm	1.504	**38.20 mm**	**(8x)**	39.02 mm	.82 mm	6 mm	100 mm	**V645357-X**	188.50
.1811	4.600 mm	.992	**25.20 mm**	**(5x)**	26.04 mm	.84 mm	6 mm	75 mm	**V522954-X**	114.00
.1811	4.600 mm	1.535	**39.00 mm**	**(8x)**	39.84 mm	.84 mm	6 mm	100 mm	**V696903-X**	188.50
.1850	4.700 mm	1.016	**25.80 mm**	**(5x)**	26.66 mm	.86 mm	6 mm	75 mm	**V725949-X**	114.00
.1850	4.700 mm	1.575	**40.00 mm**	**(8x)**	40.86 mm	.86 mm	6 mm	100 mm	**V572954-X**	188.50
.1875 (3/16)	4.762 mm	1.032	**26.20 mm**	**(5x)**	27.07 mm	.87 mm	6 mm	75 mm	**V897179-X**	114.00
.1875 (3/16)	4.762 mm	1.591	**40.40 mm**	**(8x)**	41.27 mm	.87 mm	6 mm	100 mm	**V900083-X**	188.50
.1890	4.800 mm	1.039	**26.40 mm**	**(5x)**	27.27 mm	.87 mm	6 mm	75 mm	**V787648-X**	114.00
.1890	4.800 mm	1.606	**40.80 mm**	**(8x)**	41.67 mm	.87 mm	6 mm	100 mm	**V836739-X**	188.50
.1930	4.900 mm	1.063	**27.00 mm**	**(5x)**	27.89 mm	.89 mm	6 mm	75 mm	**V709396-X**	114.00
.1930	4.900 mm	1.638	**41.60 mm**	**(8x)**	42.49 mm	.89 mm	6 mm	100 mm	**V871826-X**	188.50

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.1968	5.000 mm	1.087	**27.60 mm**	**(5x)**	28.51 mm	.91 mm	6 mm	75 mm	**V676356-X**	118.00
.1968	5.000 mm	1.677	**42.60 mm**	**(8x)**	43.51 mm	.91 mm	6 mm	100 mm	**V826060-X**	188.50
.2007	5.100 mm	1.102	**28.00 mm**	**(5x)**	28.93 mm	.93 mm	6 mm	75 mm	**V123829-X**	118.00
.2007	5.100 mm	1.709	**43.40 mm**	**(8x)**	44.33 mm	.93 mm	6 mm	100 mm	**V775217-X**	188.50
.2031 (13/64)	5.159 mm	1.118	**28.40 mm**	**(5x)**	29.34 mm	.94 mm	6 mm	75 mm	**V709714-X**	118.00
.2031 (13/64)	5.159 mm	1.724	**43.80 mm**	**(8x)**	44.74 mm	.94 mm	6 mm	100 mm	**V486375-X**	188.50
.2047	5.200 mm	1.126	**28.60 mm**	**(5x)**	29.55 mm	.95 mm	6 mm	75 mm	**V284483-X**	118.00
.2047	5.200 mm	1.740	**44.20 mm**	**(8x)**	45.15 mm	.95 mm	6 mm	100 mm	**V489580-X**	188.50
.2086	5.300 mm	1.150	**29.20 mm**	**(5x)**	30.16 mm	.96 mm	6 mm	75 mm	**V505303-X**	118.00
.2086	5.300 mm	1.772	**45.00 mm**	**(8x)**	45.96 mm	.96 mm	6 mm	100 mm	**V397648-X**	188.50
.2125	5.400 mm	1.173	**29.80 mm**	**(5x)**	30.78 mm	.98 mm	6 mm	75 mm	**V608241-X**	118.00
.2125	5.400 mm	1.811	**46.00 mm**	**(8x)**	46.98 mm	.98 mm	6 mm	100 mm	**V639671-X**	188.50
.2165	5.500 mm	1.189	**30.20 mm**	**(5x)**	31.20 mm	1.00 mm	6 mm	75 mm	**V563013-X**	118.00
.2165	5.500 mm	1.843	**46.80 mm**	**(8x)**	47.80 mm	1.00 mm	6 mm	100 mm	**V967384-X**	188.50
.2187 (7/32)	5.556 mm	1.205	**30.60 mm**	**(5x)**	31.61 mm	1.01 mm	6 mm	75 mm	**V435943-X**	118.00
.2187 (7/32)	5.556 mm	1.858	**47.20 mm**	**(8x)**	48.21 mm	1.01 mm	6 mm	100 mm	**V340002-X**	188.50
.2205	5.600 mm	1.213	**30.80 mm**	**(5x)**	31.82 mm	1.02 mm	6 mm	75 mm	**V687630-X**	118.00
.2205	5.600 mm	1.874	**47.60 mm**	**(8x)**	48.62 mm	1.02 mm	6 mm	100 mm	**V296219-X**	188.50
.2244	5.700 mm	1.236	**31.40 mm**	**(5x)**	32.44 mm	1.04 mm	6 mm	75 mm	**V902097-X**	118.00
.2244	5.700 mm	1.906	**48.40 mm**	**(8x)**	49.44 mm	1.04 mm	6 mm	100 mm	**V190000-X**	188.50
.2283	5.800 mm	1.252	**31.80 mm**	**(5x)**	32.86 mm	1.06 mm	6 mm	75 mm	**V860180-X**	118.00
.2283	5.800 mm	1.937	**49.20 mm**	**(8x)**	50.26 mm	1.06 mm	6 mm	100 mm	**V472294-X**	188.50
.2322	5.900 mm	1.276	**32.40 mm**	**(5x)**	33.47 mm	1.07 mm	6 mm	75 mm	**V506705-X**	118.00
.2322	5.900 mm	1.976	**50.20 mm**	**(8x)**	51.27 mm	1.07 mm	6 mm	100 mm	**V211763-X**	188.50
.2343 (15/64)	5.953 mm	1.291	**32.80 mm**	**(5x)**	33.88 mm	1.08 mm	6 mm	75 mm	**V443731-X**	118.00
.2343 (15/64)	5.953 mm	1.992	**50.60 mm**	**(8x)**	51.68 mm	1.08 mm	6 mm	100 mm	**V301658-X**	188.50
.2362	6.000 mm	1.299	**33.00 mm**	**(5x)**	34.09 mm	1.09 mm	8 mm	100 mm	**V316316-X**	118.00
.2362	6.000 mm	2.008	**51.00 mm**	**(8x)**	52.09 mm	1.09 mm	8 mm	125 mm	**V639871-X**	188.50
.2401	6.100 mm	1.319	**33.50 mm**	**(5x)**	34.61 mm	1.11 mm	8 mm	100 mm	**V912503-X**	145.00
.2401	6.100 mm	2.047	**52.00 mm**	**(8x)**	53.11 mm	1.11 mm	8 mm	125 mm	**V673335-X**	193.00
.2440	6.200 mm	1.339	**34.00 mm**	**(5x)**	35.13 mm	1.13 mm	8 mm	100 mm	**V898914-X**	145.00
.2440	6.200 mm	2.067	**52.50 mm**	**(8x)**	53.63 mm	1.13 mm	8 mm	125 mm	**V252129-X**	193.00
.2480	6.300 mm	1.358	**34.50 mm**	**(5x)**	35.65 mm	1.15 mm	8 mm	100 mm	**V361266-X**	145.00
.2480	6.300 mm	2.106	**53.50 mm**	**(8x)**	54.65 mm	1.15 mm	8 mm	125 mm	**V948444-X**	193.00
.2500 (1/4)	6.350 mm	1.378	**35.00 mm**	**(5x)**	36.16 mm	1.16 mm	8 mm	100 mm	**V596625-X**	145.00
.2500 (1/4)	6.350 mm	2.126	**54.00 mm**	**(8x)**	55.16 mm	1.16 mm	8 mm	125 mm	**V471924-X**	193.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.2520	6.400 mm	1.378	**35.00 mm**	**(5x)**	36.16 mm	1.16 mm	8 mm	100 mm	**V745398-X**	145.00
.2520	6.400 mm	2.146	**54.50 mm**	**(8x)**	55.66 mm	1.16 mm	8 mm	125 mm	**V480804-X**	193.00
.2559	6.500 mm	1.417	**36.00 mm**	**(5x)**	37.18 mm	1.18 mm	8 mm	100 mm	**V493400-X**	145.00
.2559	6.500 mm	2.185	**55.50 mm**	**(8x)**	56.68 mm	1.18 mm	8 mm	125 mm	**V486583-X**	193.00
.2598	6.600 mm	1.437	**36.50 mm**	**(5x)**	37.70 mm	1.20 mm	8 mm	100 mm	**V974827-X**	145.00
.2598	6.600 mm	2.205	**56.00 mm**	**(8x)**	57.20 mm	1.20 mm	8 mm	125 mm	**V348482-X**	215.00
.2638	6.700 mm	1.457	**37.00 mm**	**(5x)**	38.22 mm	1.22 mm	8 mm	100 mm	**V533319-X**	145.00
.2638	6.700 mm	2.244	**57.00 mm**	**(8x)**	58.22 mm	1.22 mm	8 mm	125 mm	**V354955-X**	215.00
.2656 (17/64)	6.746 mm	1.457	**37.00 mm**	**(5x)**	38.23 mm	1.23 mm	8 mm	100 mm	**V375598-X**	145.00
.2656 (17/64)	6.746 mm	2.264	**57.50 mm**	**(8x)**	58.73 mm	1.23 mm	8 mm	125 mm	**V286319-X**	215.00
.2677	6.800 mm	1.476	**37.50 mm**	**(5x)**	38.74 mm	1.24 mm	8 mm	100 mm	**V931711-X**	145.00
.2677	6.800 mm	2.284	**58.00 mm**	**(8x)**	59.24 mm	1.24 mm	8 mm	125 mm	**V685021-X**	215.00
.2717	6.900 mm	1.496	**38.00 mm**	**(5x)**	39.26 mm	1.26 mm	8 mm	100 mm	**V903976-X**	145.00
.2717	6.900 mm	2.303	**58.50 mm**	**(8x)**	59.76 mm	1.26 mm	8 mm	125 mm	**V577100-X**	215.00
.2756	7.000 mm	1.516	**38.50 mm**	**(5x)**	39.77 mm	1.27 mm	8 mm	100 mm	**V530079-X**	145.00
.2756	7.000 mm	2.343	**59.50 mm**	**(8x)**	60.77 mm	1.27 mm	8 mm	125 mm	**V914234-X**	215.00
.2795	7.100 mm	1.535	**39.00 mm**	**(5x)**	40.29 mm	1.29 mm	8 mm	100 mm	**V451380-X**	145.00
.2795	7.100 mm	2.382	**60.50 mm**	**(8x)**	61.79 mm	1.29 mm	8 mm	125 mm	**V282100-X**	215.00
.2812 (9/32)	7.142 mm	1.555	**39.50 mm**	**(5x)**	40.80 mm	1.30 mm	8 mm	100 mm	**V583258-X**	145.00
.2812 (9/32)	7.142 mm	2.382	**60.50 mm**	**(8x)**	61.80 mm	1.30 mm	8 mm	125 mm	**V764606-X**	215.00
.2834	7.200 mm	1.555	**39.50 mm**	**(5x)**	40.81 mm	1.31 mm	8 mm	100 mm	**V258366-X**	145.00
.2834	7.200 mm	2.402	**61.00 mm**	**(8x)**	62.31 mm	1.31 mm	8 mm	125 mm	**V215750-X**	215.00
.2874	7.300 mm	1.575	**40.00 mm**	**(5x)**	41.33 mm	1.33 mm	8 mm	100 mm	**V684490-X**	145.00
.2874	7.300 mm	2.441	**62.00 mm**	**(8x)**	63.33 mm	1.33 mm	8 mm	125 mm	**V446805-X**	215.00
.2913	7.400 mm	1.595	**40.50 mm**	**(5x)**	41.85 mm	1.35 mm	8 mm	100 mm	**V391189-X**	145.00
.2913	7.400 mm	2.480	**63.00 mm**	**(8x)**	64.35 mm	1.35 mm	8 mm	125 mm	**V568456-X**	215.00
.2952	7.500 mm	1.634	**41.50 mm**	**(5x)**	42.86 mm	1.36 mm	8 mm	100 mm	**V466533-X**	145.00
.2952	7.500 mm	2.520	**64.00 mm**	**(8x)**	65.36 mm	1.36 mm	8 mm	125 mm	**V899537-X**	215.00
.2969 (19/64)	7.541 mm	1.634	**41.50 mm**	**(5x)**	42.87 mm	1.37 mm	8 mm	100 mm	**V130050-X**	145.00
.2969 (19/64)	7.541 mm	2.520	**64.00 mm**	**(8x)**	65.37 mm	1.37 mm	8 mm	125 mm	**V555955-X**	215.00
.2992	7.600 mm	1.654	**42.00 mm**	**(5x)**	43.38 mm	1.38 mm	8 mm	100 mm	**V446731-X**	145.00
.2992	7.600 mm	2.539	**64.50 mm**	**(8x)**	65.88 mm	1.38 mm	8 mm	125 mm	**V473739-X**	215.00
.3031	7.700 mm	1.673	**42.50 mm**	**(5x)**	43.90 mm	1.40 mm	8 mm	100 mm	**V623196-X**	145.00
.3031	7.700 mm	2.579	**65.50 mm**	**(8x)**	66.90 mm	1.40 mm	8 mm	125 mm	**V597159-X**	215.00
.3071	7.800 mm	1.693	**43.00 mm**	**(5x)**	44.42 mm	1.42 mm	8 mm	100 mm	**V516266-X**	145.00
.3071	7.800 mm	2.618	**66.50 mm**	**(8x)**	67.92 mm	1.42 mm	8 mm	125 mm	**V980882-X**	215.00

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.3110	7.900 mm	1.713	**43.50 mm**	**(5x)**	44.94 mm	1.44 mm	8 mm	100 mm	**V880723-X**	145.00
.3110	7.900 mm	2.638	**67.00 mm**	**(8x)**	68.44 mm	1.44 mm	8 mm	125 mm	**V592896-X**	215.00
.3125 (5/16)	7.937 mm	1.713	**43.50 mm**	**(5x)**	44.94 mm	1.44 mm	8 mm	100 mm	**V227077-X**	145.00
.3125 (5/16)	7.937 mm	2.658	**67.50 mm**	**(8x)**	68.94 mm	1.44 mm	8 mm	125 mm	**V284014-X**	215.00
.3150	8.000 mm	1.732	**44.00 mm**	**(5x)**	45.46 mm	1.46 mm	10 mm	100 mm	**V793102-X**	145.00
.3150	8.000 mm	2.677	**68.00 mm**	**(8x)**	69.46 mm	1.46 mm	10 mm	125 mm	**V543490-X**	215.00
.3189	8.100 mm	1.752	**44.50 mm**	**(5x)**	45.97 mm	1.47 mm	10 mm	100 mm	**V794819-X**	176.00
.3189	8.100 mm	2.717	**69.00 mm**	**(8x)**	70.47 mm	1.47 mm	10 mm	125 mm	**V558544-X**	257.50
.3228	8.200 mm	1.772	**45.00 mm**	**(5x)**	46.49 mm	1.49 mm	10 mm	100 mm	**V224541-X**	176.00
.3228	8.200 mm	2.736	**69.50 mm**	**(8x)**	70.99 mm	1.49 mm	10 mm	125 mm	**V791173-X**	257.50
.3268	8.300 mm	1.791	**45.50 mm**	**(5x)**	47.01 mm	1.51 mm	10 mm	100 mm	**V846287-X**	176.00
.3268	8.300 mm	2.776	**70.50 mm**	**(8x)**	72.01 mm	1.51 mm	10 mm	125 mm	**V847161-X**	257.50
.3281 (21/64)	8.333 mm	1.811	**46.00 mm**	**(5x)**	47.52 mm	1.52 mm	10 mm	100 mm	**V132654-X**	176.00
.3281 (21/64)	8.333 mm	2.795	**71.00 mm**	**(8x)**	72.52 mm	1.52 mm	10 mm	125 mm	**V837883-X**	257.50
.3307	8.400 mm	1.811	**46.00 mm**	**(5x)**	47.53 mm	1.53 mm	10 mm	100 mm	**V800950-X**	176.00
.3307	8.400 mm	2.815	**71.50 mm**	**(8x)**	73.03 mm	1.53 mm	10 mm	125 mm	**V429782-X**	257.50
.3346	8.500 mm	1.850	**47.00 mm**	**(5x)**	48.55 mm	1.55 mm	10 mm	100 mm	**V629626-X**	176.00
.3346	8.500 mm	2.854	**72.50 mm**	**(8x)**	74.05 mm	1.55 mm	10 mm	125 mm	**V365117-X**	257.50
.3386	8.600 mm	1.870	**47.50 mm**	**(5x)**	49.07 mm	1.57 mm	10 mm	100 mm	**V934750-X**	176.00
.3386	8.600 mm	2.874	**73.00 mm**	**(8x)**	74.57 mm	1.57 mm	10 mm	125 mm	**V672857-X**	257.50
.3425	8.700 mm	1.890	**48.00 mm**	**(5x)**	49.58 mm	1.58 mm	10 mm	100 mm	**V535214-X**	176.00
.3425	8.700 mm	2.913	**74.00 mm**	**(8x)**	75.58 mm	1.58 mm	10 mm	125 mm	**V724736-X**	257.50
.3438 (11/32)	8.732 mm	1.890	**48.00 mm**	**(5x)**	49.59 mm	1.59 mm	10 mm	100 mm	**V188406-X**	176.00
.3438 (11/32)	8.732 mm	2.913	**74.00 mm**	**(8x)**	75.59 mm	1.59 mm	10 mm	125 mm	**V365910-X**	257.50
.3465	8.800 mm	1.909	**48.50 mm**	**(5x)**	50.10 mm	1.60 mm	10 mm	100 mm	**V293144-X**	176.00
.3465	8.800 mm	2.953	**75.00 mm**	**(8x)**	76.60 mm	1.60 mm	10 mm	125 mm	**V817884-X**	257.50
.3504	8.900 mm	1.929	**49.00 mm**	**(5x)**	50.62 mm	1.62 mm	10 mm	100 mm	**V818572-X**	176.00
.3504	8.900 mm	2.972	**75.50 mm**	**(8x)**	77.12 mm	1.62 mm	10 mm	150 mm	**V648679-X**	257.50
.3543	9.000 mm	1.949	**49.50 mm**	**(5x)**	51.14 mm	1.64 mm	10 mm	100 mm	**V936127-X**	176.00
.3543	9.000 mm	3.012	**76.50 mm**	**(8x)**	78.14 mm	1.64 mm	10 mm	150 mm	**V150387-X**	257.50
.3583	9.100 mm	1.969	**50.00 mm**	**(5x)**	51.66 mm	1.66 mm	10 mm	100 mm	**V347102-X**	176.00
.3583	9.100 mm	3.051	**77.50 mm**	**(8x)**	79.16 mm	1.66 mm	10 mm	150 mm	**V201118-X**	257.50
.3594 (23/64)	9.128 mm	1.969	**50.00 mm**	**(5x)**	51.66 mm	1.66 mm	10 mm	100 mm	**V859797-X**	176.00
.3594 (23/64)	9.128 mm	3.051	**77.50 mm**	**(8x)**	79.16 mm	1.66 mm	10 mm	150 mm	**V984555-X**	257.50
.3622	9.200 mm	1.988	**50.50 mm**	**(5x)**	52.17 mm	1.67 mm	10 mm	100 mm	**V317969-X**	176.00
.3622	9.200 mm	3.071	**78.00 mm**	**(8x)**	79.67 mm	1.67 mm	10 mm	150 mm	**V217215-X**	257.50

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.3661	9.300 mm	2.008	**51.00 mm**	**(5x)**	52.69 mm	1.69 mm	10 mm	100 mm	**V400752-X**	176.00
.3661	9.300 mm	3.110	**79.00 mm**	**(8x)**	80.69 mm	1.69 mm	10 mm	150 mm	**V105289-X**	257.50
.3701	9.400 mm	2.028	**51.50 mm**	**(5x)**	53.21 mm	1.71 mm	10 mm	100 mm	**V220320-X**	176.00
.3701	9.400 mm	3.150	**80.00 mm**	**(8x)**	81.71 mm	1.71 mm	10 mm	150 mm	**V421207-X**	257.50
.3740	9.500 mm	2.067	**52.50 mm**	**(5x)**	54.23 mm	1.73 mm	10 mm	100 mm	**V614370-X**	176.00
.3740	9.500 mm	3.189	**81.00 mm**	**(8x)**	82.73 mm	1.73 mm	10 mm	150 mm	**V888115-X**	257.50
.3750 (3/8)	9.525 mm	2.067	**52.50 mm**	**(5x)**	54.23 mm	1.73 mm	10 mm	100 mm	**V527488-X**	176.00
.3750 (3/8)	9.525 mm	3.189	**81.00 mm**	**(8x)**	82.73 mm	1.73 mm	10 mm	150 mm	**V571908-X**	257.50
.3780	9.600 mm	2.087	**53.00 mm**	**(5x)**	54.75 mm	1.75 mm	10 mm	100 mm	**V602463-X**	189.00
.3780	9.600 mm	3.209	**81.50 mm**	**(8x)**	83.25 mm	1.75 mm	10 mm	150 mm	**V778318-X**	257.50
.3819	9.700 mm	2.106	**53.50 mm**	**(5x)**	55.27 mm	1.77 mm	10 mm	100 mm	**V504675-X**	189.00
.3819	9.700 mm	3.248	**82.50 mm**	**(8x)**	84.27 mm	1.77 mm	10 mm	150 mm	**V739150-X**	257.50
.3858	9.800 mm	2.126	**54.00 mm**	**(5x)**	55.78 mm	1.78 mm	10 mm	100 mm	**V803165-X**	189.00
.3858	9.800 mm	3.287	**83.50 mm**	**(8x)**	85.28 mm	1.78 mm	10 mm	150 mm	**V526907-X**	257.50
.3898	9.900 mm	2.146	**54.50 mm**	**(5x)**	56.30 mm	1.80 mm	10 mm	100 mm	**V162974-X**	189.00
.3898	9.900 mm	3.307	**84.00 mm**	**(8x)**	85.80 mm	1.80 mm	10 mm	150 mm	**V265965-X**	257.50
.3906 (25/64)	9.921 mm	2.146	**54.50 mm**	**(5x)**	56.31 mm	1.81 mm	10 mm	100 mm	**V955537-X**	189.00
.3906 (25/64)	9.921 mm	3.327	**84.50 mm**	**(8x)**	86.31 mm	1.81 mm	10 mm	150 mm	**V598968-X**	257.50
.3937	10.000 mm	2.165	**55.00 mm**	**(5x)**	56.82 mm	1.82 mm	12 mm	125 mm	**V666168-X**	189.00
.3937	10.000 mm	3.347	**85.00 mm**	**(8x)**	86.82 mm	1.82 mm	12 mm	150 mm	**V703861-X**	257.50
.3976	10.100 mm	2.185	**55.50 mm**	**(5x)**	57.34 mm	1.84 mm	12 mm	125 mm	**V556342-X**	243.50
.3976	10.100 mm	3.386	**86.00 mm**	**(8x)**	87.84 mm	1.84 mm	12 mm	150 mm	**V268015-X**	344.50
.4016	10.200 mm	2.205	**56.00 mm**	**(5x)**	57.86 mm	1.86 mm	12 mm	125 mm	**V239429-X**	243.50
.4016	10.200 mm	3.406	**86.50 mm**	**(8x)**	88.36 mm	1.86 mm	12 mm	150 mm	**V358630-X**	344.50
.4055	10.300 mm	2.224	**56.50 mm**	**(5x)**	58.37 mm	1.87 mm	12 mm	125 mm	**V795138-X**	243.50
.4055	10.300 mm	3.445	**87.50 mm**	**(8x)**	89.37 mm	1.87 mm	12 mm	150 mm	**V932200-X**	344.50
.4062 (13/32)	10.317 mm	2.224	**56.50 mm**	**(5x)**	58.38 mm	1.88 mm	12 mm	125 mm	**V193040-X**	243.50
.4062 (13/32)	10.317 mm	3.445	**87.50 mm**	**(8x)**	89.38 mm	1.88 mm	12 mm	150 mm	**V880263-X**	344.50
.4094	10.400 mm	2.244	**57.00 mm**	**(5x)**	58.89 mm	1.89 mm	12 mm	125 mm	**V455264-X**	243.50
.4094	10.400 mm	3.484	**88.50 mm**	**(8x)**	90.39 mm	1.89 mm	12 mm	150 mm	**V403117-X**	344.50
.4134	10.500 mm	2.284	**58.00 mm**	**(5x)**	59.91 mm	1.91 mm	12 mm	125 mm	**V720867-X**	243.50
.4134	10.500 mm	3.524	**89.50 mm**	**(8x)**	91.41 mm	1.91 mm	12 mm	150 mm	**V789723-X**	344.50
.4173	10.600 mm	2.303	**58.50 mm**	**(5x)**	60.43 mm	1.93 mm	12 mm	125 mm	**V799193-X**	243.50
.4173	10.600 mm	3.543	**90.00 mm**	**(8x)**	91.93 mm	1.93 mm	12 mm	150 mm	**V713139-X**	344.50
.4213	10.700 mm	2.323	**59.00 mm**	**(5x)**	60.95 mm	1.95 mm	12 mm	125 mm	**V146857-X**	243.50
.4213	10.700 mm	3.583	**91.00 mm**	**(8x)**	92.95 mm	1.95 mm	12 mm	150 mm	**V786898-X**	344.50

* For h6 and h8 tolerances, see page 8.

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.4219 (27/64)	10.716 mm	2.323	**59.00 mm**	**(5x)**	60.95 mm	1.95 mm	12 mm	125 mm	**V399606-X**	243.50
.4219 (27/64)	10.716 mm	3.583	**91.00 mm**	**(8x)**	92.95 mm	1.95 mm	12 mm	150 mm	**V248975-X**	344.50
.4252	10.800 mm	2.343	**59.50 mm**	**(5x)**	61.47 mm	1.97 mm	12 mm	125 mm	**V422061-X**	243.50
.4252	10.800 mm	3.622	**92.00 mm**	**(8x)**	93.97 mm	1.97 mm	12 mm	150 mm	**V195955-X**	344.50
.4291	10.900 mm	2.362	**60.00 mm**	**(5x)**	61.98 mm	1.98 mm	12 mm	125 mm	**V540329-X**	243.50
.4291	10.900 mm	3.642	**92.50 mm**	**(8x)**	94.48 mm	1.98 mm	12 mm	175 mm	**V876962-X**	344.50
.4331	11.000 mm	2.382	**60.50 mm**	**(5x)**	62.50 mm	2.00 mm	12 mm	125 mm	**V343592-X**	243.50
.4331	11.000 mm	3.681	**93.50 mm**	**(8x)**	95.50 mm	2.00 mm	12 mm	175 mm	**V899093-X**	344.50
.4370	11.100 mm	2.402	**61.00 mm**	**(5x)**	63.02 mm	2.02 mm	12 mm	125 mm	**V352322-X**	243.50
.4370	11.100 mm	3.721	**94.50 mm**	**(8x)**	96.52 mm	2.02 mm	12 mm	175 mm	**V760218-X**	344.50
.4375 (7/16)	11.112 mm	2.402	**61.00 mm**	**(5x)**	63.02 mm	2.02 mm	12 mm	125 mm	**V845356-X**	243.50
.4375 (7/16)	11.112 mm	3.721	**94.50 mm**	**(8x)**	96.52 mm	2.02 mm	12 mm	175 mm	**V439028-X**	344.50
.4409	11.200 mm	2.421	**61.50 mm**	**(5x)**	63.54 mm	2.04 mm	12 mm	125 mm	**V543395-X**	243.50
.4409	11.200 mm	3.740	**95.00 mm**	**(8x)**	97.04 mm	2.04 mm	12 mm	175 mm	**V275937-X**	344.50
.4449	11.300 mm	2.441	**62.00 mm**	**(5x)**	64.06 mm	2.06 mm	12 mm	125 mm	**V274775-X**	243.50
.4449	11.300 mm	3.780	**96.00 mm**	**(8x)**	98.06 mm	2.06 mm	12 mm	175 mm	**V718898-X**	344.50
.4488	11.400 mm	2.461	**62.50 mm**	**(5x)**	64.57 mm	2.07 mm	12 mm	125 mm	**V212694-X**	243.50
.4488	11.400 mm	3.819	**97.00 mm**	**(8x)**	99.07 mm	2.07 mm	12 mm	175 mm	**V700150-X**	344.50
.4527	11.500 mm	2.500	**63.50 mm**	**(5x)**	65.59 mm	2.09 mm	12 mm	125 mm	**V711465-X**	243.50
.4527	11.500 mm	3.858	**98.00 mm**	**(8x)**	100.09 mm	2.09 mm	12 mm	175 mm	**V356032-X**	344.50
.4531 (29/64)	11.508 mm	2.500	**63.50 mm**	**(5x)**	65.59 mm	2.09 mm	12 mm	125 mm	**V353391-X**	243.50
.4531 (29/64)	11.508 mm	3.858	**98.00 mm**	**(8x)**	100.09 mm	2.09 mm	12 mm	175 mm	**V409601-X**	344.50
.4567	11.600 mm	2.520	**64.00 mm**	**(5x)**	66.11 mm	2.11 mm	12 mm	125 mm	**V646698-X**	243.50
.4567	11.600 mm	3.878	**98.50 mm**	**(8x)**	100.61 mm	2.11 mm	12 mm	175 mm	**V865206-X**	344.50
.4606	11.700 mm	2.539	**64.50 mm**	**(5x)**	66.63 mm	2.13 mm	12 mm	125 mm	**V847917-X**	243.50
.4606	11.700 mm	3.917	**99.50 mm**	**(8x)**	101.63 mm	2.13 mm	12 mm	175 mm	**V559316-X**	344.50
.4646	11.800 mm	2.559	**65.00 mm**	**(5x)**	67.15 mm	2.15 mm	12 mm	125 mm	**V925309-X**	243.50
.4646	11.800 mm	3.957	**100.50 mm**	**(8x)**	102.65 mm	2.15 mm	12 mm	175 mm	**V336564-X**	344.50
.4685	11.900 mm	2.579	**65.50 mm**	**(5x)**	67.67 mm	2.17 mm	12 mm	125 mm	**V168544-X**	243.50
.4685	11.900 mm	3.976	**101.00 mm**	**(8x)**	103.17 mm	2.17 mm	12 mm	175 mm	**V985664-X**	344.50
.4688 (15/32)	11.907 mm	2.579	**65.50 mm**	**(5x)**	67.67 mm	2.17 mm	12 mm	125 mm	**V798383-X**	243.50
.4688 (15/32)	11.907 mm	3.976	**101.00 mm**	**(8x)**	103.17 mm	2.17 mm	12 mm	175 mm	**V603519-X**	344.50
.4724	12.000 mm	2.598	**66.00 mm**	**(5x)**	68.18 mm	2.18 mm	14 mm	125 mm	**V282193-X**	243.50
.4724	12.000 mm	4.016	**102.00 mm**	**(8x)**	104.18 mm	2.18 mm	14 mm	175 mm	**V588339-X**	344.50

* For h6 and h8 tolerances, see page 8.

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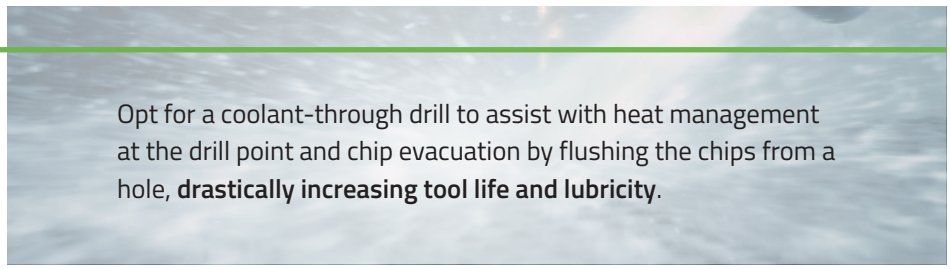
Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D_1 (h8)*		L_2		L_3	L_4	D_2 (h6)*	L_1	Tool #	Price
.4764	12.100 mm	2.618	**66.50 mm**	**(5x)**	68.70 mm	2.20 mm	14 mm	125 mm	**V165416-X**	321.00
.4764	12.100 mm	4.055	**103.00 mm**	**(8x)**	105.20 mm	2.20 mm	14 mm	175 mm	**V611187-X**	353.00
.4803	12.200 mm	2.638	**67.00 mm**	**(5x)**	69.22 mm	2.22 mm	14 mm	125 mm	**V499243-X**	321.00
.4803	12.200 mm	4.075	**103.50 mm**	**(8x)**	105.72 mm	2.22 mm	14 mm	175 mm	**V556731-X**	353.00
.4843	12.300 mm	2.658	**67.50 mm**	**(5x)**	69.74 mm	2.24 mm	14 mm	125 mm	**V606643-X**	321.00
.4843	12.300 mm	4.114	**104.50 mm**	**(8x)**	106.74 mm	2.24 mm	14 mm	175 mm	**V449949-X**	353.00
.4882 (31/64)	12.400 mm	2.677	**68.00 mm**	**(5x)**	70.26 mm	2.26 mm	14 mm	125 mm	**V619843-X**	321.00
.4882 (31/64)	12.400 mm	4.154	**105.50 mm**	**(8x)**	107.76 mm	2.26 mm	14 mm	175 mm	**V558340-X**	353.00
.4921	12.500 mm	2.717	**69.00 mm**	**(5x)**	71.27 mm	2.27 mm	14 mm	125 mm	**V436056-X**	321.00
.4921	12.500 mm	4.193	**106.50 mm**	**(8x)**	108.77 mm	2.27 mm	14 mm	175 mm	**V744710-X**	353.00
.4961	12.600 mm	2.736	**69.50 mm**	**(5x)**	71.79 mm	2.29 mm	14 mm	125 mm	**V509952-X**	321.00
.4961	12.600 mm	4.213	**107.00 mm**	**(8x)**	109.29 mm	2.29 mm	14 mm	175 mm	**V520602-X**	353.00
.5000 (1/2)	12.700 mm	2.756	**70.00 mm**	**(5x)**	72.31 mm	2.31 mm	14 mm	125 mm	**V838117-X**	321.00
.5000 (1/2)	12.700 mm	4.252	**108.00 mm**	**(8x)**	110.31 mm	2.31 mm	14 mm	175 mm	**V188335-X**	353.00

* For h6 and h8 tolerances, see page 8.

Tech Tip



Opt for a coolant-through drill to assist with heat management at the drill point and chip evacuation by flushing the chips from a hole, **drastically increasing tool life and lubricity**.

Speeds & Feeds

High Performance Drills for Steels

Important Notes

Values in table are in inches and are based on standard (up to 7x Dia) length of flute solid carbide drills.
Longer lengths of flute: table values of IPR must be reduced (for 8x, reduce to 75%) and SFM must be reduced (for 8x, reduce to 80%).
Steels at 29-37 Rc: an initial peck should be 2-3x Diameter, and each subsequent peck should be 1-2x Diameter.
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 complete speeds and feeds charts, please see **valorholemaking.com/resources/speeds-and-feeds.**

Coolant-Through Notes

For Coolant-through carbide drills, table values of IPR must be reduced (reduced to 90%) and SFM can increase (increase up to 125%).
For best results, the following steps are recommended:

- For hole depths of 7x Diameter or greater, drill a pilot hole up to 1.5-2x D in depth using a drill with 3x LOF or shorter.
- Insert primary drill at low speed (~50-500 RPM) and start coolant flow.
- Increase speed and feed to recommended parameters.
- Under optimal conditions, a pecking cycle should not be needed.
- On through holes, reduce feed rate by 50% just before break through with drill point.
- Feed at 50% to final 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.

Material Guide		SFM	Chip Load (IPR) by Drill Diameter									
			1/16	5/64	3/32	1/8	3/16	1/4	5/16	3/8	7/16	1/2
Carbon Steel	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	475-560	.002-.003	.002-.003	.003-.004	.004-.005	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Low Alloy Steel	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	360-500	.003-.004	.003-.004	.004-.005	.005-.006	.005-.007	.006-.008	.008-.010	.009-.012	.010-.013	.011-.015
Tool Steel	A2, H13, L6, P20, S7	200-275	.002-.003	.002-.003	.003-.004	.004-.005	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Austenitic Stainless Steels	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	150-275	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Martensitic & Ferritic Stainless Steels	403, 410, 416, 420, 440, 430, 446	150-275	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
PH Stainless Steels	15-5, 17-4, Carpenter 450, Carpenter 465	100-200	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Gray Cast Irons	SAE J431, ASTM A48	525-690	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Malleable Cast Irons	ASTM A47, ASTM A220, ASTM A602	425-460	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013
Nodular (Ductile) Cast Irons	ASTM A536, ASTM 897	360-500	.002-.003	.002-.003	.003-.004	.003-.004	.004-.006	.005-.007	.006-.008	.007-.010	.008-.011	.009-.013

General Notes

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions.

If you require additional information, Valor Holemaking has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **866-840-1505** or **Valortech@harveyperformance.com**.

Combined Drill & Countersinks

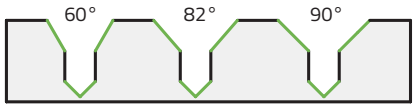
Val-Max X coated for superior performance

Excellent Choice for Predrilling Applications

- Designed for predrilling 60°, 82°, or 90° live center holes
- Double-ended design for minimized downtime and increased productivity
- 2 flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

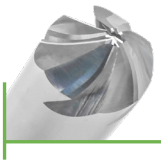
Included Angle	Size	Drill Diameter	Drill Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
A $^{+1°}_{-1°}$		$D_1{}^{+.0015''}_{+.0005''}$	$L_2{}^{+.005''}_{-.000''}$	D_2	L_1	Tool #	Price	Tool #	Price
60°	000	.020	.020	1/8	1-1/2	V556663	30.60	V556663-X	37.40
	00	.025	.025	1/8	1-1/2	V185274	23.90	V185274-X	30.70
	0	1/32	1/32	1/8	1-1/2	V859307	23.90	V859307-X	30.70
	1	3/64	3/64	1/8	1-1/2	V302266	20.00	V302266-X	26.80
	2	5/64	5/64	3/16	2	V894928	30.60	V894928-X	38.30
	3	7/64	7/64	1/4	2	V866774	34.80	V866774-X	44.00
	4	1/8	1/8	5/16	2-1/2	V903674	47.60	V903674-X	59.40
	5	3/16	3/16	7/16	2-3/4	V797008	71.20	V797008-X	87.50
82°	00	.025	.025	1/8	1-1/2	V929455	25.60	V929455-X	32.40
	0	1/32	1/32	1/8	1-1/2	V909420	25.30	V909420-X	32.10
	1	3/64	3/64	1/8	1-1/2	V217225	21.20	V217225-X	28.00
	2	5/64	5/64	3/16	2	V237177	32.60	V237177-X	40.30
	3	7/64	7/64	1/4	2	V364987	37.10	V364987-X	46.30
	4	1/8	1/8	5/16	2-1/2	V905694	50.30	V905694-X	62.00
	5	3/16	3/16	7/16	2-3/4	V256631	75.60	V256631-X	91.80
90°	000	.020	.020	1/8	1-1/2	V358715	31.60	V358715-X	38.40
	00	.025	.025	1/8	1-1/2	V493350	24.70	V493350-X	31.50
	0	1/32	1/32	1/8	1-1/2	V914209	24.70	V914209-X	31.50
	1	3/64	3/64	1/8	1-1/2	V734917	20.80	V734917-X	27.60
	2	5/64	5/64	3/16	2	V813931	31.60	V813931-X	39.30
	3	7/64	7/64	1/4	2	V814543	35.90	V814543-X	45.10
	4	1/8	1/8	5/16	2-1/2	V690770	48.80	V690770-X	60.50
	5	3/16	3/16	7/16	2-3/4	V698131	73.30	V698131-X	89.50

Stocked in three included angles



High Performance Chamfer Cutters

Helically Fluted



Helical Flute Geometry for Superior Part Finish

Outstanding in High Performance Countersinking Applications

- Optimized for countersinking and chamfering operations while providing excellent performance in deburring applications
- Free cutting action design provides excellent surface finish and chip evacuation
- Engineered with a specialized helical flute design for superior performance
- Offered in Type I pointed and Type II flat end (non-cutting) styles
- Offered in 60°, 90°, and 120° included angles
- 2, 3, 4, and 5 flute options
- h6 shank tolerance for high precision tool holders
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

Included Angle	Diameter	Flutes	Tip	Type	Length of Cut		Overall Length	Uncoated		Val-Max X Coated	
A +0°30' −0°30'	D2 (h6)		T*		L2	L4 (Max.)	L1	Tool #	Price	Tool #	Price
60°	1/8	2	.010	I	.100		1-1/2	V303773	23.20	V303773-X	30.00
	1/8	3	.040	II	.074	.036	1-1/2	V672817	23.70	V672817-X	30.50
	1/8	5	.040	II	.074	.036	1-1/2	V295829	25.60	V295829-X	32.40
	3/16	2	.010	I	.154		2	V699490	32.00	V699490-X	39.60
	3/16	3	.050	II	.119	.045	2	V337326	32.00	V337326-X	39.60
	3/16	5	.050	II	.119	.045	2	V752883	34.10	V752883-X	41.80
	1/4	2	.010	I	.208		2-1/2	V127405	39.50	V127405-X	49.30
	1/4	3	.060	II	.164	.054	2-1/2	V209624	37.00	V209624-X	46.80
	1/4	4	.010	I	.208		2-1/2	V712592	41.70	V712592-X	51.50
	1/4	5	.060	II	.164	.054	2-1/2	V806101	40.40	V806101-X	50.20
	3/8	2	.010	I	.316		2-1/2	V313911	52.80	V313911-X	66.80
	3/8	3	.070	II	.264	.062	2-1/2	V124536	49.60	V124536-X	63.60
	3/8	4	.010	I	.316		2-1/2	V164693	52.80	V164693-X	66.80
	3/8	5	.070	II	.264	.062	2-1/2	V631112	49.60	V631112-X	63.60

*Tolerance for Type I is +.000"/-.005". Tolerance for Type II is +.002"/-.002"

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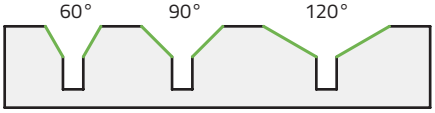
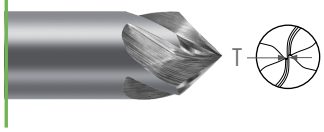
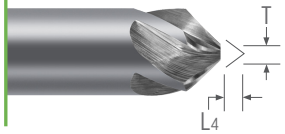
Stocked in three included angles



Type I: Pointed



Type II: Flat End (non-cutting)



High Performance Chamfer Cutters

Helically Fluted (cont.)

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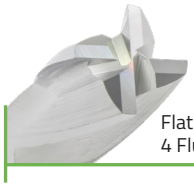
Included Angle	Diameter	Flutes	Tip	Type	Length of Cut		Overall Length	Uncoated		Val-Max X Coated	
A +0°30' −0°30'	$D_{2\ (h6)}$		T*		L_2	$L_{4\ (Max.)}$	L_1	Tool #	Price	Tool #	Price
60°	1/2	2	.010	I	.424		3	V419548	74.10	V419548-X	93.00
	1/2	3	.080	II	.364	.071	3	V660602	69.50	V660602-X	88.50
	1/2	4	.010	I	.424		3	V349044	74.10	V349044-X	93.00
	1/2	5	.080	II	.364	.071	3	V927193	69.50	V927193-X	88.50
90°	1/8	2	.010	I	.058		1-1/2	V429507	23.20	V429507-X	30.00
	1/8	3	.040	II	.043	.021	1-1/2	V200401	23.20	V200401-X	30.00
	1/8	4	.010	I	.058		1-1/2	V786295	25.60	V786295-X	32.40
	1/8	5	.040	II	.043	.021	1-1/2	V908769	25.60	V908769-X	32.40
	3/16	2	.010	I	.089		2	V531414	31.30	V531414-X	39.00
	3/16	3	.050	II	.069	.026	2	V811095	31.30	V811095-X	39.00
	3/16	4	.010	I	.089		2	V622369	33.40	V622369-X	41.00
	3/16	5	.050	II	.069	.026	2	V527430	33.40	V527430-X	41.00
	1/4	2	.010	I	.120		2-1/2	V919405	39.50	V919405-X	49.30
	1/4	3	.060	II	.095	.031	2-1/2	V280810	37.00	V280810-X	46.80
	1/4	4	.010	I	.120		2-1/2	V958539	41.70	V958539-X	51.50
	1/4	5	.060	II	.095	.031	2-1/2	V790762	39.20	V790762-X	49.00
	3/8	2	.010	I	.183		2-1/2	V311320	52.80	V311320-X	66.80
	3/8	3	.070	II	.153	.036	2-1/2	V345394	49.60	V345394-X	63.60
	3/8	4	.010	I	.183		2-1/2	V236486	52.80	V236486-X	66.80
	3/8	5	.070	II	.153	.036	2-1/2	V612425	49.60	V612425-X	63.60
	1/2	2	.010	I	.245		3	V666461	74.10	V666461-X	93.00
	1/2	3	.080	II	.210	.041	3	V966684	69.50	V966684-X	88.50
	1/2	4	.010	I	.245		3	V800918	74.10	V800918-X	93.00
	1/2	5	.080	II	.210	.041	3	V796283	69.50	V796283-X	88.50
120°	1/8	2	.010	I	.033		1-1/2	V712928	25.60	V712928-X	32.40
	3/16	2	.010	I	.051		2	V289865	32.00	V289865-X	39.60
	3/16	4	.010	I	.051		2	V100906	32.00	V100906-X	39.60
	1/4	2	.010	I	.069		2-1/2	V190535	39.50	V190535-X	49.30
	1/4	3	.060	II	.057	.018	2-1/2	V373551	38.00	V373551-X	47.80
	1/4	4	.010	I	.069		2-1/2	V724215	41.70	V724215-X	51.50
	1/4	5	.060	II	.057	.018	2-1/2	V199619	40.40	V199619-X	50.20
	3/8	2	.010	I	.105		2-1/2	V295545	53.90	V295545-X	67.80
	3/8	3	.070	II	.091	.021	2-1/2	V546651	49.60	V546651-X	63.60
	3/8	4	.010	I	.105		2-1/2	V647726	56.00	V647726-X	70.00
	3/8	5	.070	II	.091	.021	2-1/2	V590509	53.10	V590509-X	67.00
	1/2	2	.010	I	.141		3	V998108	74.10	V998108-X	93.00
	1/2	3	.080	II	.126	.024	3	V327236	71.50	V327236-X	90.50
	1/2	4	.010	I	.141		3	V147300	74.10	V147300-X	93.00
	1/2	5	.080	II	.126	.024	3	V628260	73.70	V628260-X	92.70

*Tolerance for Type I is +.000"/-.005". Tolerance for Type II is +.002"/-.002"

Counterbores

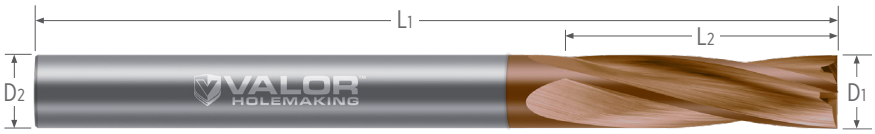
Flat Bottom



Flat Bottom
4 Flute Design

Outstanding for Flat Bottom Reaming or Straightening Misaligned Holes

- Flat bottom design (no dish) allows for spot facing or counterboring on irregular surfaces commonly found on rounded or complex parts
- Provides excellent performance when flat bottom reaming or straightening misaligned holes
- Ground with full cylindrical margin (not side cutting)
- Center cutting
- 15° helix
- 4 flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Cutter Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
D_1 $^{+.0000*}_{-.0005}$	L_2 $^{+.030''}_{-.000''}$	D_2	L_1	Tool #	Price	Tool #	Price
.0625 (1/16)	**1/4**	1/8	1-1/2	**V695306**	50.40	**V695306-X**	57.20
.0781 (5/64)	**5/16**	1/8	1-1/2	**V778476**	50.40	**V778476-X**	57.20
.0787 (2 mm)	**5/16**	1/8	1-1/2	**V408316**	50.40	**V408316-X**	57.20
.0937 (3/32)	**3/8**	1/8	1-1/2	**V892625**	50.40	**V892625-X**	57.20
.1094 (7/64)	**3/8**	1/8	1-1/2	**V745187**	50.40	**V745187-X**	57.20
.1181 (3 mm)	**3/8**	1/8	1-1/2	**V939405**	50.40	**V939405-X**	57.20
.1250 (1/8)	**1/2**	1/8	1-1/2	**V527625**	50.40	**V527625-X**	57.20
.1406 (9/64)	**9/16**	3/16	2	**V783531**	48.20	**V783531-X**	55.90
.1562 (5/32)	**5/8**	3/16	2	**V321622**	48.20	**V321622-X**	55.90
.1575 (4 mm)	**5/8**	3/16	2	**V372376**	48.20	**V372376-X**	55.90
.1719 (11/64)	**5/8**	3/16	2	**V508715**	48.20	**V508715-X**	55.90
.1875 (3/16)	**3/4**	3/16	2	**V370840**	48.20	**V370840-X**	55.90
.1968 (5 mm)	**3/4**	1/4	2-1/2	**V699368**	65.90	**V699368-X**	75.70

*Tolerance refers to uncoated counterbores. Tolerance for Val-Max X coated counterbores is +.0002"/-.0005".

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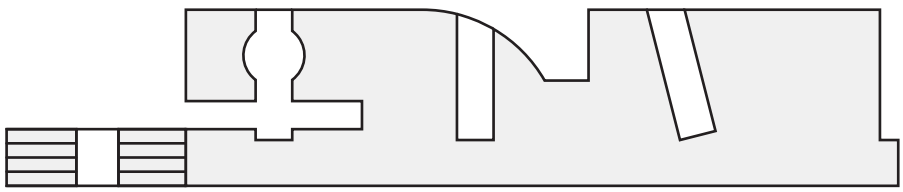
Flat Bottom Counterbore Applications



Thin Plate Drilling | Cross Hole Drilling | Irregular/Rounded Surface Drilling | Angled Drilling | Half Hole Drilling

Counterbores

Flat Bottom (cont.)

continued from previous page

Cutter Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
D_1 $^{+.0000*}_{-.0005}$	L_2 $^{+.030''}_{-.000''}$	D_2	L_1	Tool #	Price	Tool #	Price
.2031 (13/64)	**3/4**	1/4	2-1/2	**V568926**	65.90	**V568926-X**	75.70
.2187 (7/32)	**3/4**	1/4	2-1/2	**V631036**	65.90	**V631036-X**	75.70
.2344 (15/64)	**7/8**	1/4	2-1/2	**V478565**	65.90	**V478565-X**	75.70
.2362 (6 mm)	**7/8**	1/4	2-1/2	**V105885**	65.90	**V105885-X**	75.70
.2500 (1/4)	**7/8**	1/4	2-1/2	**V472098**	65.90	**V472098-X**	75.70
.2656 (17/64)	**7/8**	5/16	2-1/2	**V418764**	81.30	**V418764-X**	93.00
.2812 (9/32)	**7/8**	5/16	2-1/2	**V865510**	81.30	**V865510-X**	93.00
.2969 (19/64)	**7/8**	5/16	2-1/2	**V700371**	81.30	**V700371-X**	93.00
.3125 (5/16)	**1**	5/16	2-1/2	**V487755**	81.30	**V487755-X**	93.00
.3150 (8 mm)	**1**	3/8	2-1/2	**V740046**	97.10	**V740046-X**	111.10
.3281 (21/64)	**1**	3/8	2-1/2	**V202645**	97.10	**V202645-X**	111.10
.3437 (11/32)	**1**	3/8	2-1/2	**V538304**	97.10	**V538304-X**	111.10
.3594 (23/64)	**1**	3/8	2-1/2	**V311756**	97.10	**V311756-X**	111.10
.3750 (3/8)	**1**	3/8	2-1/2	**V712621**	97.10	**V712621-X**	111.10
.3937 (10 mm)	**1**	7/16	2-3/4	**V802980**	119.80	**V802980-X**	136.10
.4062 (13/32)	**1**	7/16	2-3/4	**V217929**	119.80	**V217929-X**	136.10
.4375 (7/16)	**1**	7/16	2-3/4	**V151214**	119.80	**V151214-X**	136.10
.4724 (12 mm)	**1**	1/2	3	**V585315**	157.60	**V585315-X**	176.50
.5000 (1/2)	**1**	1/2	3	**V847030**	157.60	**V847030-X**	176.50
.5625 (9/16)	**1-1/2**	5/8	3-1/2	**V294033**	223.80	**V294033-X**	247.40
.6250 (5/8)	**1-1/2**	5/8	3-1/2	**V127143**	250.70	**V127143-X**	274.30
.7500 (3/4)	**1-1/2**	3/4	4	**V988795**	363.40	**V988795-X**	391.40

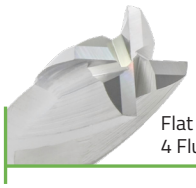
*Tolerance refers to uncoated counterbores. Tolerance for Val-Max X coated counterbores is +.0002"/-.0005".

Tech Tip

When drilling into an extremely irregular surface, a spot drill may not be sufficient to keep holes in the correct position. For these applications, first use a Flat Bottom Counterbore to **level off the area you intend to machine,** then continue to a spotting application.

Counterbores

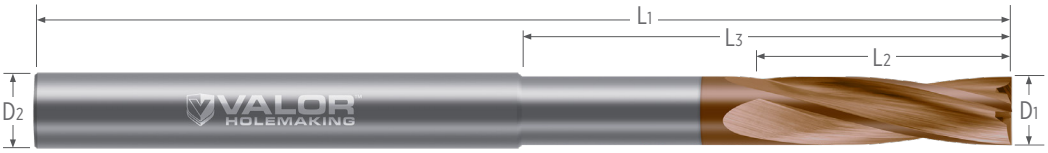
Flat Bottom – Long Reach



Flat Bottom
4 Flute Design

Unmatched Precision in Long Reach Counterboring Applications

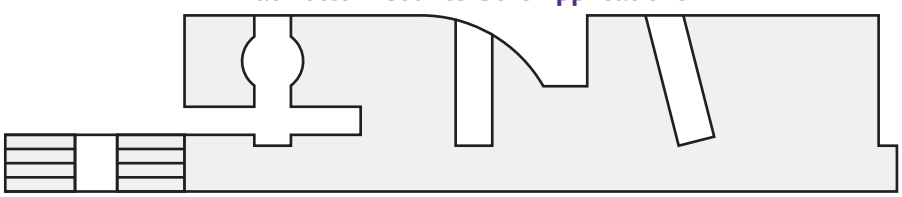
- Engineered with an undersized neck to avoid heeling
- Flat bottom design (no dish) allows for spot facing or counterboring on irregular surfaces commonly found on rounded or complex parts
- Provides excellent performance when flat bottom reaming or straightening misaligned holes
- Ground with full cylindrical margin (not side cutting)
- Center cutting
- 15° helix
- 4 flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Cutter Diameter	Flute Length	Overall Reach	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
D_1 $^{+.0000*}_{-.0005}$	L_2 $^{+.030}_{-.000}$	L_3 $^{+.030}_{-.000}$	D_2	L_1	Tool #	Price	Tool #	Price
.0625 (1/16)	**1/4**	1/2	1/8	2-1/2	**V198627**	60.20	**V198627-X**	67.40
.0937 (3/32)	**3/8**	3/4	1/8	2-1/2	**V916746**	60.20	**V916746-X**	67.40
.1181 (3 mm)	**3/8**	1	1/8	2-1/2	**V951006**	60.20	**V951006-X**	67.40
.1250 (1/8)	**1/2**	1	1/8	2-1/2	**V970511**	60.20	**V970511-X**	67.40
.1406 (9/64)	**9/16**	1-1/8	3/16	3	**V416335**	73.30	**V416335-X**	81.50
.1562 (5/32)	**5/8**	1-1/4	3/16	3	**V663791**	73.30	**V663791-X**	81.50
.1719 (11/64)	**5/8**	1-3/8	3/16	3	**V809396**	73.30	**V809396-X**	81.50
.1875 (3/16)	**3/4**	1-1/2	3/16	3	**V595314**	73.30	**V595314-X**	81.50
.2187 (7/32)	**3/4**	1-3/4	1/4	4	**V912152**	97.30	**V912152-X**	107.80
.2500 (1/4)	**7/8**	2	1/4	4	**V655322**	97.30	**V655322-X**	107.80
.3125 (5/16)	**1**	2-1/2	5/16	4	**V184545**	123.40	**V184545-X**	136.00
.3437 (11/32)	**1**	2-3/4	3/8	4	**V484325**	148.80	**V484325-X**	163.80
.3750 (3/8)	**1**	3	3/8	4	**V559859**	148.80	**V559859-X**	163.80
.4375 (7/16)	**1**	3	7/16	4	**V317536**	172.80	**V317536-X**	190.20
.5000 (1/2)	**1**	3	1/2	4	**V593960**	211.80	**V593960-X**	232.10

* Tolerance refers to uncoated counterbores. Tolerance for Val-Max X coating is +.0002″/–.0005″

Flat Bottom Counterbore Applications



Thin Plate Drilling | Cross Hole Drilling | Irregular/Rounded Surface Drilling | Angled Drilling | Half Hole Drilling

Thread Mills

Multi-Form – UN Threads

Common Thread Sizes Available

Amazingly Versatile in Right & Left Hand Thread Milling

- Specifically engineered to cut internal and external 60° UN threads
- Designed to mill right hand and left hand threads for added versatility
- Able to cut larger threads of the same pitch
- Offered in 3, 4, and 6 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
2-56	.065	.125	3*	1/8	2	**V776212**	108.20	**V776212-X**	115.00
3-48	.075	.167	3*	1/8	2	**V223050**	114.30	**V223050-X**	121.10
4-40	.085	.175	3*	1/8	2	**V825130**	114.30	**V825130-X**	121.10
5-44	.095	.228	3	1/8	2	**V333694**	114.30	**V333694-X**	121.10
6-32	.100	.218	3	1/8	2	**V729602**	118.30	**V729602-X**	125.10
8-32	.115	.250	3	1/8	2	**V619489**	126.90	**V619489-X**	133.70
8-36	.115	.250	3	1/8	2	**V338962**	126.90	**V338962-X**	133.70
10-24	.120	.312	3	1/8	2	**V196853**	133.50	**V196853-X**	140.30
10-32	.120	.312	3	1/8	2	**V370770**	133.50	**V370770-X**	140.30
1/4-20	.180	.500	3	3/16	2-1/2	**V740289**	159.80	**V740289-X**	168.00
1/4-28	.180	.500	3	3/16	2-1/2	**V605861**	159.80	**V605861-X**	168.00
5/16-18	.235	.625	3	1/4	2-1/2	**V728692**	173.10	**V728692-X**	182.90
5/16-24	.235	.625	3	1/4	2-1/2	**V794382**	195.70	**V794382-X**	205.50
3/8-16	.285	.750	4	5/16	3	**V397436**	233.00	**V397436-X**	244.80
3/8-24	.285	.750	4	5/16	3	**V891917**	233.00	**V891917-X**	244.80
7/16-14	.305	.750	4	5/16	3	**V801115**	233.00	**V801115-X**	244.80
7/16-20	.335	.875	4	3/8	3-1/2	**V198821**	251.50	**V198821-X**	266.40
1/2-13	.350	.875	4	3/8	3-1/2	**V274534**	259.90	**V274534-X**	274.80
1/2-20	.370	1.000	6	3/8	3-1/2	**V547751**	272.90	**V547751-X**	287.80

*Straight flutes

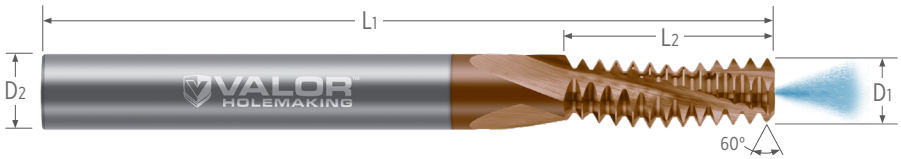
Thread Mills

Multi-Form – UN Threads – Coolant-Through

Single Coolant-Through Channel Design

Enhanced Coolant-Through Design for Superior Chip Ejection

- Coolant-through design allows for maximum chip ejection in blind holes
- Designed to mill right hand and left hand 60° UN threads
- Able to cut larger threads of the same pitch
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.000}_{-.002}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
10-24	.145	.312	3	3/16	2-3/8	**V396731**	147.20	**V396731-X**	155.30
10-32	.150	.312	3	3/16	2-3/8	**V889790**	147.20	**V889790-X**	155.30
1/4-20	.180	.500	3	3/16	2-3/8	**V656064**	176.80	**V656064-X**	185.00
1/4-28	.180	.500	3	3/16	2-3/8	**V989312**	176.80	**V989312-X**	185.00
5/16-18	.235	.625	3	1/4	2-3/8	**V843484**	190.50	**V843484-X**	200.30
5/16-24	.235	.625	3	1/4	2-3/8	**V722664**	222.50	**V722664-X**	232.30
3/8-16	.285	.750	4	5/16	3	**V720638**	256.90	**V720638-X**	268.60
3/8-24	.285	.750	4	5/16	3	**V756737**	256.90	**V756737-X**	268.60
7/16-14	.305	.750	4	5/16	3	**V217976**	256.90	**V217976-X**	268.60
7/16-20	.335	.875	4	3/8	3	**V454378**	276.70	**V454378-X**	290.60
1/2-13	.350	.875	4	3/8	3	**V492881**	285.50	**V492881-X**	299.40

Tech Tip

Opt for a coolant-through thread mill in blind hole applications. The coolant-through ability of the tool produces **superior chip evacuation** while also delivering coolant directly to the tip of the tool, decreasing friction and allowing for increased cutting speeds.

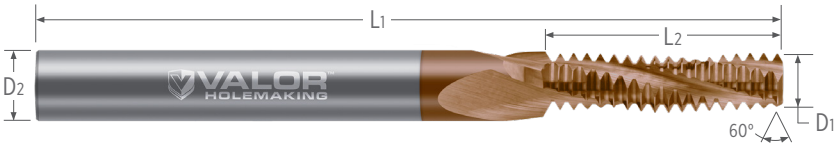
Thread Mills

Multi-Form – UN Threads – Long Flute

Long Flute Design
for Deep Threading

Superb Strength in UN Applications

- Specifically designed for deep threaded applications
- Increased cutter diameter allows for maximum strength while achieving 60% threads
- Designed to mill right hand and left hand internal 60°UN threads
- Able to cut larger threads of the same pitch
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
2-56	.069	.215	3	1/8	2	**V862814**	137.10	**V862814-X**	143.90
3-48	.079	.250	3	1/8	2	**V175206**	144.00	**V175206-X**	150.80
4-40	.089	.275	3	1/8	2	**V764399**	144.00	**V764399-X**	150.80
6-32	.110	.375	3	1/8	2	**V139322**	144.00	**V139322-X**	150.80
8-32	.131	.407	3	3/16	2-1/2	**V911231**	153.30	**V911231-X**	161.50
8-36	.131	.417	3	3/16	2-1/2	**V109682**	161.20	**V109682-X**	169.30
10-24	.145	.500	3	3/16	2-1/2	**V547075**	189.20	**V547075-X**	197.30
10-32	.150	.500	3	3/16	2-1/2	**V571131**	189.20	**V571131-X**	197.30
1/4-20	.195	.750	3	1/4	2-1/2	**V904085**	192.30	**V904085-X**	202.10
1/4-28	.195	.750	3	1/4	2-1/2	**V377926**	192.30	**V377926-X**	202.10
5/16-18	.245	.944	3	5/16	3	**V455088**	249.80	**V455088-X**	261.60
5/16-24	.245	.958	3	5/16	3	**V184026**	256.40	**V184026-X**	268.10
3/8-16	.300	1.125	4	3/8	3-1/2	**V868122**	297.90	**V868122-X**	312.80
3/8-24	.300	1.125	4	3/8	3-1/2	**V558722**	306.60	**V558722-X**	321.60
7/16-20	.350	1.300	4	3/8	3-1/2	**V108189**	306.60	**V108189-X**	321.60
1/2-13	.400	1.308	4	1/2	3-1/2	**V518107**	311.00	**V518107-X**	331.30

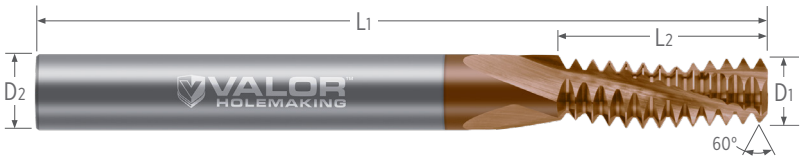
Thread Mills

Multi-Form – Metric Threads

Common Thread Sizes Available

Efficiently Machines Both Internal & External Metric Threads

- Specifically engineered to cut internal and external 60° Metric threads
- Designed to mill right hand and left hand Metric threads for added versatility
- Able to cut larger threads of the same pitch
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
M3-0.50	.085	.178	3	1/8	2	**V705769**	131.80	**V705769-X**	138.60
M4-0.70	.115	.276	3	1/8	2	**V221421**	131.80	**V221421-X**	138.60
M4.5-0.75	.120	.250	3	1/8	2	**V751646**	131.80	**V751646-X**	138.60
M5-0.80	.120	.312	3	1/8	2	**V520089**	131.80	**V520089-X**	138.60
M6-1.00	.170	.500	3	3/16	2-1/2	**V411343**	160.00	**V411343-X**	168.20
M8-1.25	.235	.625	3	1/4	2-1/2	**V689550**	172.00	**V689550-X**	181.80
M10-1.50	.300	.750	4	5/16	3	**V473531**	232.00	**V473531-X**	243.80
M12-1.75	.360	.875	4	3/8	3-1/2	**V550418**	258.20	**V550418-X**	273.10
M14-1.50	.370	.875	4	3/8	3-1/2	**V956048**	258.20	**V956048-X**	273.10

Tech Tip

Provide an immediate boost in your threading jobs with a multi-form thread mill, as they are optimized to produce a **full thread in a single helical interpolation**. Additionally, they allow a machinist to quickly turn around production-style jobs.

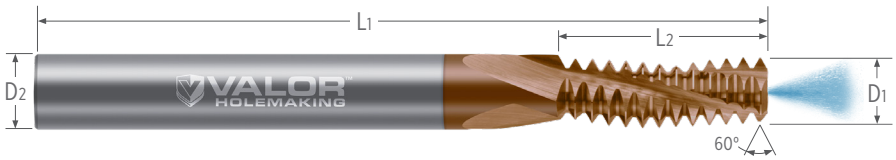
Thread Mills

Multi-Form – Metric Threads – Coolant-Through

Single Coolant-Through Channel Design

Maximum Chip Ejection in Blind Hole Applications

- Coolant-through design allows for maximum chip ejection in blind holes
- Designed to mill right hand and left hand 60° Metric threads
- Able to cut larger threads of the same pitch
- 3 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.000}_{-.002}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
M3-0.50	.085	.1780	3	1/8	2	**V757297**	151.60	**V757297-X**	158.40
M4-0.70	.115	.2760	3	1/8	2	**V954960**	151.60	**V954960-X**	158.40
M5-0.80	.120	.3125	3	1/8	2	**V490771**	151.60	**V490771-X**	158.40
M6-1.00	.170	.5000	3	3/16	2-1/2	**V875636**	184.20	**V875636-X**	192.30
M8-1.25	.235	.6250	3	1/4	2-1/2	**V388421**	197.90	**V388421-X**	207.70

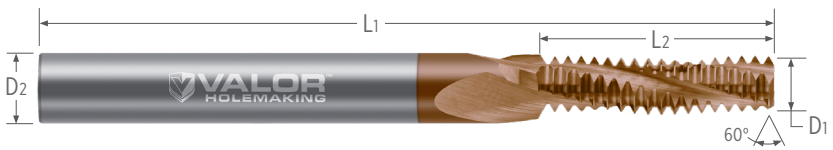
Thread Mills

Multi-Form – Metric Threads – Long Flute

Long Flute Design for Deep Threading

Excellent in Deep Threading Metric Applications

- Specifically designed for deep threaded applications
- Increased cutter diameter allows for maximum strength while achieving 60% threads
- Designed to mill right hand and left hand internal 60° Metric threads
- Able to cut larger threads of the same pitch
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide



Thread Size	Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
M3-0.50	.090	.276	3	1/8	2	**V837004**	169.60	**V837004-X**	176.40
M4-0.70	.124	.441	3	3/16	2-1/2	**V503448**	173.80	**V503448-X**	182.00
M5-0.80	.155	.504	3	3/16	2-1/2	**V256903**	173.80	**V256903-X**	182.00
M6-1.00	.186	.748	3	1/4	2-1/2	**V790009**	201.30	**V790009-X**	211.10
M8-1.25	.245	.984	3	5/16	2-1/2	**V659859**	258.90	**V659859-X**	270.60
M10-1.50	.311	1.122	4	3/8	3-1/2	**V975146**	325.00	**V975146-X**	339.90

Tech Tip

When your job requires deep threads, opt for a Long Flute Thread Mill. They are engineered with a **large cutter diameter and core,** equipping them with the necessary geometries for superior tool strength and stability.

Thread Mills

Multi-Form – NPT Threads

Available in 3 and 4 Helical Flutes

Optimized Specifically for Internal & External 60° NPT Threads

- Engineered to cut internal and external 60° National Pipe Taper (NPT) threads
- Designed to mill right hand and left hand threads for added versatility
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

Thread Size	Major Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
1/16, 1/8-27	.245	.437	3	1/4	2-1/2	**V614054**	163.50	**V614054-X**	173.30
1/4, 3/8-18	.305	.625	4	5/16	3	**V897256**	224.10	**V897256-X**	235.90
1/4, 3/8-18	.363	.680	4	3/8	3-1/2	**V224635**	238.40	**V224635-X**	253.40
1/2, 3/4-14	.495	.875	4	1/2	3-1/2	**V641508**	261.50	**V641508-X**	281.80
1, 2-11.5	.620	1.125	4	5/8	4	**V175728**	369.80	**V175728-X**	393.40

Thread Mills

Multi-Form – NPTF Threads

Geometry designed for NPTF Threading

Efficiency-Boosting Design for Right Hand & Left Hand Thread Milling

- Engineered to cut internal and external 60° National Pipe Taper Fuel (NPTF) threads
- Designed to mill right hand and left hand threads for added versatility
- Offered in 3 and 4 helical flutes
- Uncoated option well-suited for Aluminum Alloys and other Non-Ferrous Alloys
- Proprietary Val-Max X coating for improved tool life and heat resistance in ferrous materials, including Alloy Steels, Stainless Steels, Nickel Alloys, and other high hardness materials up to 65 Rc
- Solid carbide

Thread Size	Major Cutter Diameter	Length of Cut	Flutes	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
	D_1 $^{+.0005}_{-.0005}$	L_2		D_2	L_1	Tool #	Price	Tool #	Price
1/16, 1/8-27	.245	.437	3	1/4	2-1/2	**V284224**	191.00	**V284224-X**	200.80
1/4, 3/8-18	.305	.625	4	5/16	3	**V169267**	228.10	**V169267-X**	239.90
1/2, 3/4-14	.495	.875	4	1/2	3-1/2	**V683311**	296.10	**V683311-X**	316.40
1, 2-11.5	.620	1.125	4	5/8	4	**V633813**	440.70	**V633813-X**	464.30

Tech Tip

When selecting a thread mill, choose only a cutter diameter as large as your job requires. A smaller cutter diameter will help **achieve higher quality threads**.

Technical Information

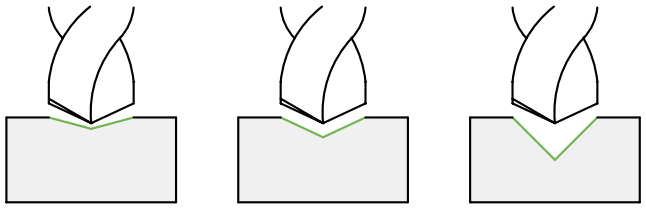
Properly Select a Valor Holemaking High Performance Spotting Drill

Drilling an ultra-precise hole is often tough, but it doesn't have to be. A Valor Holemaking High Performance Spotting Drill, if used properly, will eliminate the chance of drill walking and will help to ensure a more accurate final product. A Spotting Drill's purpose is to create a small divot to correctly locate the center of a drill when initiating a plunge.

Choosing a High Performance Spotting Drill

Point Angle

Ideally, the center of a carbide drill should always be the first point to contact your part. Therefore, a spotting drill should have **a slightly larger point angle** than that of your drill. If a spotting drill with a smaller point angle than your drill is used, your drill may be damaged due to shock loading when the outer portion of its cutting surface contacts the workpiece before the center. Using a drill angle equal to the drill angle is also an acceptable situation.



Valor Holemaking High Performance Spotting Drills are offered with **90°**, **135°**, and **140°** point angles.

Drill Diameter

Valor Holemaking High Performance Spotting Drills are offered in 3.00 mm, 4.00 mm, 6.00 mm, 8.00 mm, 10.00 mm, 12.00 mm, and 16.00 mm drill diameters for each of its point angle options. Opting for a Spotting Drill drill diameter of at least 67% of your High Performance Drill diameter, is a great starting point.

When Won't a Spot Drill Work for My Application?

When drilling into an extremely irregular surface, such as the side of a cylinder or an inclined plane, a High Performance Spotting Drill alone may not be sufficient to keep holes in the correct position. For these applications, Flat Bottom Counterbores may be needed to creating accurate features. Explore Counterbores on page 58 of this catalog.

Coolant Usage Best Practices & Recommendations

There are several advantages to following a proper coolant strategy when performing a CNC drilling operation, regardless of if the Valor Holemaking High Performance Drill being used is enabled with coolant-through geometry or not.

Coolant-through geometry allows for coolant to travel within the drill, itself, and be applied directly to the cutting location. In doing so, concerns of chip packing in blind hole applications are mitigated, even in depths beyond 5x that of the drill diameter (5xD), as chips are easily removed from the created hole via high pressure coolant. Because of this, coolant-through geometry is extremely beneficial to a high performance drilling application, and should be a machinist's first choice.

At a minimum, coolant pressure of 600-800 psi is recommended for deep hole drilling in applications that exceed a drill depth of larger than 8xD. When coolant-through geometry is not an option due to machine or material concerns, flood coolant or other means of coolant will be necessary.

Did You Know?

When Using a Valor Holemaking Coolant-Through High Performance Drill, a pecking cycle is not needed under optimal conditions. When using a solid round drill, a pecking cycle approach may be needed when exceeding depths of 3xD. Please review Speeds & Feeds information for each Valor Holemaking High Performance Drill offering on pages 31 or 54 for more information.

Technical Information

Decimal Equivalent Chart

Drill Size & Fractions	MM	Inch
–	0.05	0.0020
–	0.1	0.0039
#97	0.15	0.0059
#96	–	0.0063
#95	–	0.0067
#94	–	0.0071
#93	–	0.0075
#92	0.2	0.0079
#91	–	0.0083
#90	–	0.0087
#89	–	0.0091
#88	–	0.0095
–	0.25	0.0098
#87	–	0.0100
#86	–	0.0105
#85	–	0.0110
#84	–	0.0115
–	0.3	0.0118
#83	–	0.0120
#82	–	0.0125
#81	–	0.0130
#80	–	0.0135
–	0.35	0.0138
#79	–	0.0145
1/64 in	–	0.0156
–	0.4	0.0157
#78	–	0.0160
–	0.45	0.0177
#77	–	0.0180
–	0.5	0.0197
#76	–	0.0200
#75	–	0.0210
–	0.55	0.0217
#74	–	0.0225
–	0.6	0.0236
#73	–	0.0240
#72	–	0.0250
–	0.65	0.0256
#71	–	0.0260
–	0.7	0.0276
#70	–	0.0280
#69	–	0.0292
–	0.75	0.0295
#68	–	0.0310
1/32 in	–	0.0313
–	0.8	0.0315
#67	–	0.0320
#66	–	0.0330
–	0.85	0.0335
#65	–	0.0350
–	0.9	0.0354
#64	–	0.0360
#63	–	0.0370
–	0.95	0.0374
#62	–	0.0380
#61	–	0.0390
–	1	0.0394
#60	–	0.0400
#59	–	0.0410
–	1.05	0.0413
#58	–	0.0420
#57	–	0.0430
–	1.1	0.0433
–	1.15	0.0453
#56	–	0.0465
3/64 in	–	0.0469
–	1.2	0.0472
–	1.25	0.0492
–	1.3	0.0512
#55	–	0.0520
–	1.35	0.0531
#54	–	0.0550
–	1.4	0.0551
–	1.45	0.0571
–	1.5	0.0591

Drill Size & Fractions	MM	Inch
#53	–	0.0595
–	1.55	0.0610
1/16 in	–	0.0625
–	1.6	0.0630
#52	–	0.0635
–	1.65	0.0650
–	1.7	0.0669
#51	–	0.0670
–	1.75	0.0689
#50	–	0.0700
–	1.8	0.0709
–	1.85	0.0728
#49	–	0.0730
–	1.9	0.0748
#48	–	0.0760
–	1.95	0.0768
5/64 in	–	0.0781
#47	–	0.0785
–	2	0.0787
–	2.05	0.0807
#46	–	0.0810
#45	–	0.0820
–	2.1	0.0827
–	2.15	0.0846
#44	–	0.0860
–	2.2	0.0866
–	2.25	0.0886
#43	–	0.0890
–	2.3	0.0906
–	2.35	0.0925
#42	–	0.0935
3/32 in	–	0.0938
–	2.4	0.0945
#41	–	0.0960
–	2.45	0.0965
#40	–	0.0980
–	2.5	0.0984
#39	–	0.0995
–	2.55	0.1004
#38	–	0.1015
–	2.6	0.1024
#37	–	0.1040
–	2.65	0.1043
–	2.7	0.1063
#36	–	0.1065
–	2.75	0.1083
7/64 in	–	0.1094
#35	–	0.1100
–	2.8	0.1102
#34	–	0.1110
–	2.85	0.1122
#33	–	0.1130
–	2.9	0.1142
#32	–	0.1160
–	2.95	0.1161
–	3	0.1181
#31	–	0.1200
–	3.05	0.1201
–	3.1	0.1220
–	3.15	0.1240
1/8 in	–	0.1250
–	3.2	0.1260
–	3.25	0.1280
#30	–	0.1285
–	3.3	0.1299
–	3.35	0.1319
–	3.4	0.1339
–	3.45	0.1358
#29	–	0.1360
–	3.5	0.1378
–	3.55	0.1398
#28	–	0.1405
9/64 in	–	0.1406
–	3.6	0.1417
–	3.65	0.1437

Drill Size & Fractions	MM	Inch
#27	–	0.1440
–	3.7	0.1457
#26	–	0.1470
–	3.75	0.1476
#25	–	0.1495
–	3.8	0.1496
–	3.85	0.1516
#24	–	0.1520
–	3.9	0.1535
#23	–	0.1540
–	3.95	0.1555
5/32 in	–	0.1563
#22	–	0.1570
–	4	0.1575
#21	–	0.1590
#20	–	0.1610
–	4.1	0.1614
–	4.2	0.1654
#19	–	0.1660
–	4.3	0.1693
#18	–	0.1695
11/64 in	–	0.1719
#17	–	0.1730
–	4.4	0.1732
#16	–	0.1770
–	4.5	0.1772
#15	–	0.1800
–	4.6	0.1811
#14	–	0.1820
#13	4.7	0.1850
3/16 in	–	0.1875
#12	4.8	0.1890
#11	–	0.1910
–	4.9	0.1929
#10	–	0.1935
#9	–	0.1960
–	5	0.1969
#8	–	0.1990
–	5.1	0.2008
#7	–	0.2010
13/64 in	–	0.2031
#6	–	0.2040
–	5.2	0.2047
#5	–	0.2055
–	5.3	0.2087
#4	–	0.2090
–	5.4	0.2126
#3	–	0.2130
–	5.5	0.2165
7/32 in	–	0.2188
–	5.6	0.2205
#2	–	0.2210
–	5.7	0.2244
#1	–	0.2280
–	5.8	0.2283
–	5.9	0.2323
A	–	0.2340
15/64 in	–	0.2344
–	6	0.2362
B	–	0.2380
–	6.1	0.2402
C	–	0.2420
–	6.2	0.2441
D	–	0.2460
–	6.3	0.2480
1/4 in - E	–	0.2500
–	6.4	0.2520
–	6.5	0.2559
F	–	0.2570
–	6.6	0.2598
G	–	0.2610
–	6.7	0.2638
17/64 in	–	0.2656
H	–	0.2660
–	6.8	0.2677

Drill Size & Fractions	MM	Inch
–	6.9	0.2717
I	–	0.2720
–	7	0.2756
J		0.2770
–	7.1	0.2795
K	–	0.2810
9/32 in	–	0.2813
–	7.2	0.2835
–	7.3	0.2874
L	–	0.2900
–	7.4	0.2913
M	–	0.2950
–	7.5	0.2953
19/64 in	–	0.2969
–	7.6	0.2992
N	–	0.3020
–	7.7	0.3031
–	7.8	0.3071
–	7.9	0.3110
5/16 in	–	0.3125
–	8	0.3150
O	–	0.3160
–	8.1	0.3189
–	8.2	0.3228
P	–	0.3230
–	8.3	0.3268
21/64 in	–	0.3281
–	8.4	0.3307
Q	–	0.3320
–	8.5	0.3346
–	8.6	0.3386
R	–	0.3390
–	8.7	0.3425
11/32 in	–	0.3438
–	8.8	0.3465
S	–	0.3480
–	8.9	0.3504
–	9	0.3543
T	–	0.3580
–	9.1	0.3583
23/64 in	–	0.3594
–	9.2	0.3622
–	9.3	0.3661
U	–	0.3680
–	9.4	0.3701
–	9.5	0.3740
3/8 in	–	0.3750
V	–	0.3770
–	9.6	0.3780
–	9.7	0.3819
–	9.8	0.3858
W	–	0.3860
–	9.9	0.3898
25/64 in	–	0.3906
–	10	0.3937
X	–	0.3970
–	10.1	0.3976
–	10.2	0.4016
Y	–	0.4040
–	10.3	0.4055
13/32 in	–	0.4063
–	10.4	0.4094
Z	–	0.4130
–	10.5	0.4134
–	10.6	0.4173
–	10.7	0.4213
27/64 in	–	0.4219
–	10.8	0.4252
–	10.9	0.4291
–	11	0.4331
–	11.1	0.4370
7/16 in	–	0.4375
–	11.2	0.4409
–	11.3	0.4449
–	11.4	0.4488

Drill Size & Fractions	MM	Inch
–	11.5	0.4528
29/64 in	–	0.4531
–	11.6	0.4567
–	11.7	0.4606
–	11.8	0.4646
–	11.9	0.4685
15/32 in	–	0.4688
–	12	0.4724
–	12.1	0.4764
–	12.2	0.4803
–	12.3	0.4843
31/64 in	–	0.4844
–	12.4	0.4882
–	12.5	0.4921
–	12.6	0.4961
1/2 in	12.7	0.5000
–	12.8	0.5039
–	12.9	0.5079
–	13	0.5118
33/64 in	–	0.5156
17/32 in	–	0.5313
–	13.5	0.5315
35/64 in	–	0.5469
–	14	0.5512
9/16 in	–	0.5625
–	14.5	0.5709
37/64 in		0.5781
–	15	0.5906
19/32 in	–	0.5938
39/64 in	–	0.6094
–	15.5	0.6102
5/8 in	–	0.6250
–	16	0.6299
41/64 in	–	0.6406
–	16.5	0.6496
21/32 in	–	0.6563
–	17	0.6693
43/64 in	–	0.6719
11/16 in	–	0.6875
–	17.5	0.6890
45/64 in	–	0.7031
–	18	0.7087
23/32 in	–	0.7188
–	18.5	0.7283
47/64 in	–	0.7344
–	19	0.7480
3/4 in	–	0.7500
49/64 in	–	0.7656
–	19.5	0.7677
25/32 in	–	0.7813
–	20	0.7874
51/64 in	–	0.7969
–	20.5	0.8071
13/16 in	–	0.8125
–	21	0.8268
53/64 in	–	0.8281
27/32 in	–	0.8438
–	21.5	0.8465
55/64 in	–	0.8594
–	22	0.8661
7/8 in	–	0.8750
–	22.5	0.8858
57/64 in	–	0.8906
–	23	0.9055
29/32 in	–	0.9063
59/64 in	–	0.9219
–	23.5	0.9252
15/16 in	–	0.9375
–	24	0.9449
61/64 in	–	0.9531
–	24.5	0.9646
31/32 in	–	0.9688
–	25	0.9843
63/64 in	–	0.9844
1 in	25.4	1.0000

Technical Information

Tap & Drill Sizes and Equations

Tap Size	CUT TAPS – Target Theor. % of Thread ~55%	~65%	~75%	FORM TAPS – Target Theor. % of Thread ~55%	~65%	~75%
0 – 80	1.30 mm	1.25 mm	1.20 mm	1.40 mm	1.38 mm	1.36 mm
M1.6 x 0.35	1.35 mm	1.30 mm	1.25 mm	1.47 mm	1.44 mm	1.42 mm
M1.8 x 0.35	1.55 mm	1.50 mm	1.45 mm	1.67 mm	1.64 mm	1.62 mm
1 – 64	1/16 in	# 53	1.45 mm	# 51	1.68 mm	1.65 mm
1 – 72	1.60 mm	1.55 mm	# 53	1.72 mm	1.70 mm	1.67 mm
M2 x 0.40	# 51	1.65 mm	1.60 mm	# 49	1.82 mm	1.79 mm
2 – 56	# 49	1.80 mm	1.73 mm	2.01 mm	5/64 in	1.95 mm
2 – 64	1.87 mm	# 49	1.80 mm	2.03 mm	2.00 mm	5/64 in
M2.2 x 0.45	# 49	1.80 mm	1.75 mm	2.03 mm	2.00 mm	1.97 mm
M2.5 x 0.45	# 44	2.10 mm	# 46	2.33 mm	2.30 mm	2.27 mm
3 – 48	2.12 mm	# 46	2.00 mm	2.32 mm	2.27 mm	2.24 mm
3 – 56	# 44	2.13 mm	# 46	2.34 mm	2.30 mm	2.28 mm
4 – 40	3/32 in	2.30 mm	2.20 mm	2.60 mm	2.55 mm	2.52 mm
4 – 48	2.45 mm	3/32 in	2.32 mm	# 37	2.60 mm	# 38
M3 x 0.50	# 37	# 38	2.50 mm	2.80 mm	7/64 in	2.75 mm
M3 x 0.35	2.75 mm	2.70 mm	2.65 mm	# 33	2.85 mm	# 34
5 – 40	# 36	# 37	# 39	2.93 mm	2.88 mm	2.85 mm
5 – 44	2.75 mm	2.70 mm	2.60 mm	2.95 mm	2.92 mm	# 33
M3.5 x 0.60	# 31	3.00 mm	2.90 mm	3.27 mm	3.23 mm	3.20 mm
M3.5 x 0.35	3.25 mm	3.20 mm	3.15 mm	3.37 mm	3.35 mm	3.32 mm
6 – 32	# 32	# 34	# 36	3.20 mm	3.15 mm	3.10 mm
6 – 40	# 31	# 32	# 33	# 30	3.22 mm	1/8 in
M4 x 0.70	3.50 mm	3.40 mm	3.30 mm	# 26	3.70 mm	3.65 mm
M4 x 0.50	3.65 mm	9/64 in	3.50 mm	# 25	3.77 mm	3.77 mm
8 – 32	3.60 mm	3.50 mm	3.40 mm	# 24	# 25	3.75 mm
8 – 36	# 27	9/64 in	# 29	3.90 mm	# 24	# 25
M4.5 x 0.75	5/32 in	# 24	# 25	# 19	4.15 mm	4.10 mm
M4.5 x 0.50	4.15 mm	4.06 mm	4.00 mm	# 18	4.27 mm	4.25 mm
10 – 24	# 21	# 23	# 25	4.42 mm	11/64 in	4.27 mm
10 – 32	4.25 mm	4.15 mm	# 21	4.52 mm	4.45 mm	4.40 mm
M5 x 0.80	4.40 mm	4.30 mm	4.20 mm	# 13	4.65 mm	4.60 mm
M5 x 0.50	# 14	# 15	# 16	# 12	3/16 in	4.75 mm
12 – 24	# 13	4.60 mm	4.45 mm	5.06 mm	5.00 mm	4.95 mm
12 – 28	# 12	# 13	4.60 mm	5.15 mm	5.06 mm	5.00 mm
M6 x 1.00	5.25 mm	13/64 in	5.00 mm	# 2	7/32 in	5.50 mm
M6 x 0.75	5.45 mm	5.35 mm	5.25 mm	5.70 mm	5.65 mm	# 2
1/4 – 20	# 3	# 5	# 7	5.85 mm	# 1	5.70 mm
1/4 – 28	5.70 mm	7/32 in	5.45 mm	6.00 mm	15/64 in	5.90 mm
M7 x 1.00	Ltr D	Ltr C	6.00 mm	Ltr G	Ltr F	6.50 mm
M7 x 0.75	6.40 mm	1/4 in	Ltr D	6.70 mm	6.65 mm	6.60 mm
5/16 – 18	Ltr I	17/64 in	Ltr F	7.40 mm	7.30 mm	7.20 mm
5/16 – 24	9/32 in	Ltr J	Ltr I	19/64 in	7.45 mm	7.40 mm
M8 x 1.25	7.10 mm	Ltr I	Ltr H	19/64 in	7.45 mm	Ltr L
M8 x 1.00	7.25 mm	9/32 in	7.00 mm	7.60 mm	19/64 in	7.50 mm
3/8– 16	8.40 mm	Ltr P	5/16 in	8.90 mm	8.80 mm	11/32 in
3/8– 24	11/32 in	Ltr R	8.50 mm	23/64 in	9.05 mm	9.00 mm
M10 x 1.50	8.90 mm	11/32 in	8.50 mm	9.40 mm	9.30 mm	9.20 mm
M10 x 1.25	9.10 mm	8.90 mm	11/32 in	3/8 in	9.45 mm	Ltr U
M10 x 1.00	9.25 mm	23/64 in	9.00 mm	9.60 mm	9.55 mm	9.50 mm
7/16 – 14	Ltr W	Ltr V	Ltr U	10.40 mm	10.30 mm	10.20 mm
7/16 – 20	10.20 mm	10.00 mm	9.95 mm	10.60 mm	10.50 mm	Ltr Z
M12 x 1.75	27/64 in	10.50 mm	10.30 mm	11.30 mm	11.20 mm	7/16 in
M12 x 1.50	10.90 mm	27/64 in	10.50 mm	11.40 mm	11.30 mm	11.20 mm
M12 x 1.00	11.25 mm	7/16 in	11.00 mm	11.60 mm	11.55 mm	11.50 mm
1/2 – 13	11.30 mm	11.00 mm	27/64 in	15/32 in	11.80 mm	11.70 mm
1/2– 20	11.80 mm	11.60 mm	11.40 mm	12.20 mm	12.10 mm	12.05 mm
M14 x 2.00	12.50 mm	31/64 in	12.00 mm	13.20 mm	33/64 in	13.00 mm
M14 x 1.50	12.90 mm	1/2 in	12.50 mm	13.40 mm	13.30 mm	13.20 mm
9/16 – 12	1/2 in	12.50 mm	12.20 mm	17/32 in	13.30 mm	13.20 mm
9/16 – 18	13.25 mm	33/64 in	12.90 mm	13.75 mm	13.65 mm	13.55 mm
5/8 – 11	14.20 mm	13.90 mm	13.60 mm	15.00 mm	14.80 mm	37/64 in
5/8 – 18	14.80 mm	37/64 in	14.50 mm	15.30 mm	15.25 mm	15.15 mm
M16 x 2.00	14.50 mm	9/16 in	14.00 mm	15.25 mm	15.10 mm	15.00 mm
M16 x 1.50	14.90 mm	14.70 mm	14.50 mm	15.40 mm	15.30 mm	15.20 mm
M18 x 2.50	16.20 mm	5/8 in	5.50 mm	43/64 in	6.90 mm	16.75 mm
M18 x 1.50	16.90 mm	21/32 in	16.50 mm	17.40 mm	17.30 mm	17.25 mm
3/4 – 10	17.20 mm	16.90 mm	16.50 mm	18.10 mm	45/64 in	17.70 mm
3/4 – 16	17.90 mm	17.70 mm	17.50 mm	18.40 mm	18.30 mm	23/32 in
M20 x 2.50	18.20 mm	45/64 in	17.50 mm	3/4 in	18.90 mm	47/64 in
M20 x 1.50	18.90 mm	18.75 mm	8.50 mm	49/64 in	9.30 mm	19.25 mm
M22 x 2.50	51/64 in	25/32 in	9.50 mm	53/64 in	20.90 mm	20.75 mm
M22 x 1.50	20.90 mm	20.75 mm	20.50 mm	27/32 in	21.30 mm	21.25 mm
7/8 – 9	51/64 in	25/32 in	19.50 mm	21.10 mm	21.00 mm	20.75 mm
7/8 – 14	20.90 mm	13/16 in	20.40 mm	21.50 mm	27/32 in	21.30 mm
M24 x 3.00	55/64 in	27/32 in	53/64 in	22.80 mm	57/64 in	22.50 mm
M24 x 2.00	22.50 mm	7/8 in	22.00 mm	23.25 mm	23.10 mm	23.00 mm
1 – 8	29/32 in	57/64 in	22.25 mm	61/64 in	24.00 mm	23.75 mm
1 – 12	15/16 in	23.60 mm	23.30 mm	31/32 in	24.40 mm	24.25 mm

~ = approximetly

UNC/UNF Taps: Calculating Drill Size for Specific % of Thread

$$\text{Cut Taps Drill Size (in)} = \frac{\text{BD} - \text{Desired \% of Thread} \times .01299}{\text{TPI}}$$

$$\text{Form Taps Drill Size (in)} = \frac{\text{BD} - \text{Desired \% of Thread} \times .0068}{\text{TPI}}$$

M/MF Taps: Calculating Drill Size for Specific % of Thread

$$\text{Cut Taps Drill Size (mm)} = \frac{\text{BD} - \text{Desired \% of Thread} \times \text{Pitch}}{76.98}$$

$$\text{Form Taps Drill Size (mm)} = \frac{\text{BD} - \text{Desired \% of Thread} \times \text{Pitch}}{10.5}$$

Speed / Feed Equations

$$\text{RPM} = \frac{\text{SFM}}{\text{Dia. in}} \times 3.82 \qquad \text{RPM} = \frac{\text{SFM}}{\text{Dia. (mm)}} \times 97.028$$

$$\text{IPR} = \frac{1}{\text{TPI}} \qquad \text{IPR} = \text{Pitch (mm)} \times 0.0394$$

End Mill Equations

SFM = 0.26 x RPM x Dia. in

IPM = No. of teeth x IPT x RPM

$$\text{Cut time sec} = \frac{\text{Milling Length}}{\text{IPM}} \times 60$$

Q = Depth of Cut in. x Width of Cut in.

$$\text{RPM} = \frac{\text{SFM}}{\text{Dia. in}} \times 3.82$$

Drill Equations

IPM = IPR x R

SFM = 0.26 x RPM x Dia. in

$$\text{RPM} = \frac{\text{SFM}}{\text{Dia. in}} \times 3.82$$

$$\text{Cut time sec} = \frac{\text{Milling Length}}{\text{IPM}} \times 60$$

Conversions

$$\text{Inch} = \frac{\text{mm}}{25.4} \qquad \text{Gal} = \frac{\text{Liter}}{3.79}$$

PSI = Bar x 14.7

SFM = m/min. x 3.28

$$\text{IPR} = \frac{\text{mm/rev.}}{25.4}$$

Torque = NM x 0.7376

HP = KW x 1.34

Equation Key

SFM = Surface Foot Per Min.
RPM = Rotations Per Minute
IPT = Inches Per Tooth
TPI = Threads Per Inch
IPR = Inches Per Revolution
PSI = Pounds Per Square Inch
Q = Minimum Cutting Depth
HP = Horse Power
KW = Kilowatts Per Hour
BD = Basic Diameter

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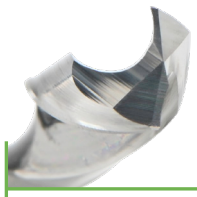
What Makes Us Different

At Valor Holemaking, we don't just simply resharpen your tooling, we restore it to its **original superior quality & tolerances.**



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- Split
- Land
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With even more cost-per-hole savings!

Reconditioning Program
(cont.)

How To Get Started

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STEP 2
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STEP 3
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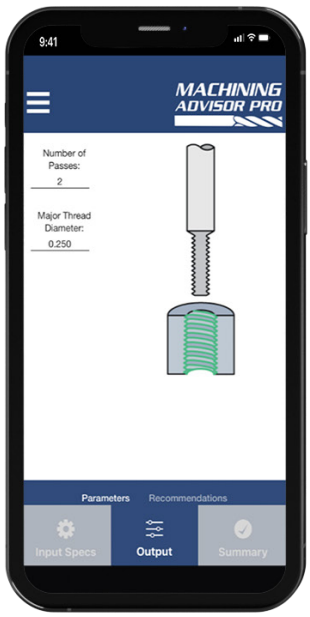

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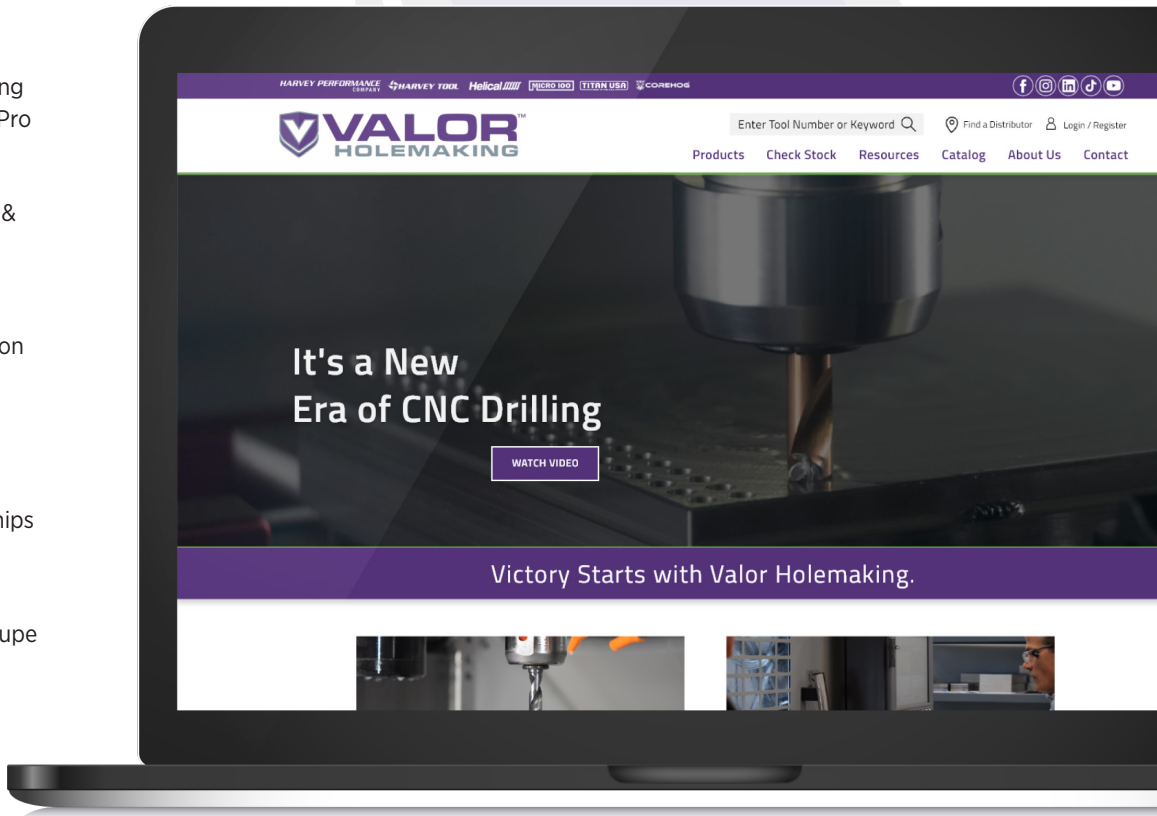
- Machining Advisor Pro
- Speeds & Feeds
- Simulation Files
- CAM Partnerships
- In The Loupe Blog



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