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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.

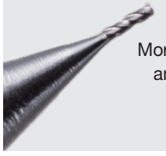
Manufactured in the USA

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.

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All tool images appearing in this catalog are illustrations of exemplary tools. Printed in the USA.

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

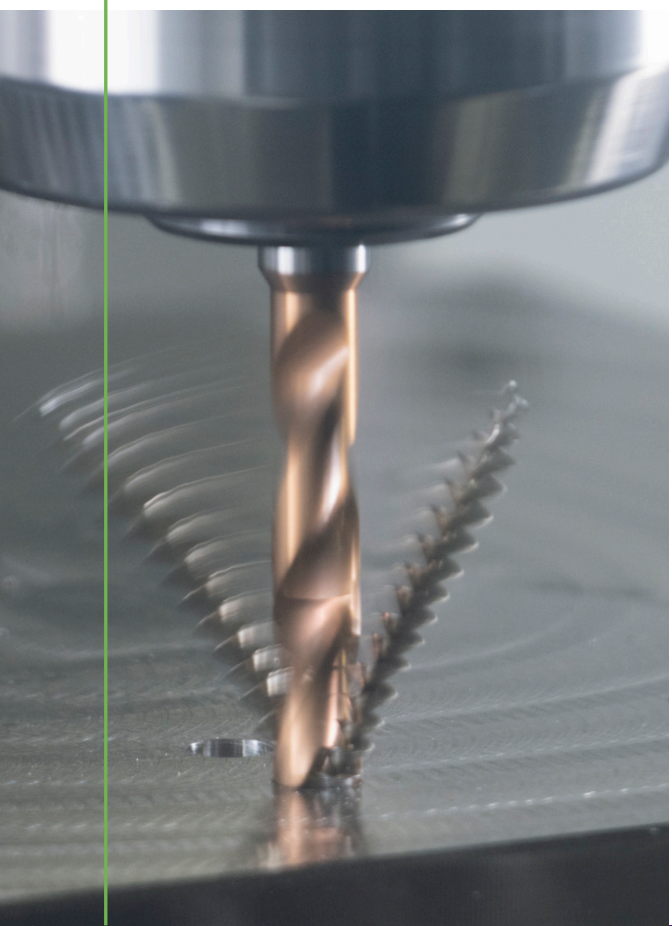
- **Superior Hole Quality & Performance**
- **Reduced Cost-Per-Hole**
- **Reliable, Fully Stocked Inventory**
- **Engineered & Manufactured in the USA.**

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

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Counterbores

THREADING

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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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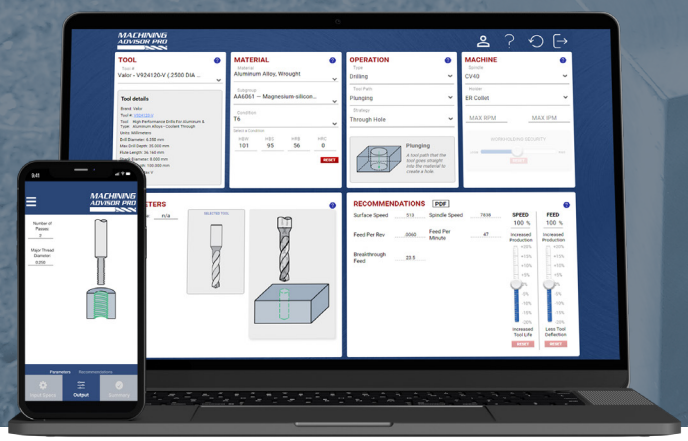


Take your **Valor Holemaking** products further by generating and following customized running parameters for your specific setup and workpiece material.

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

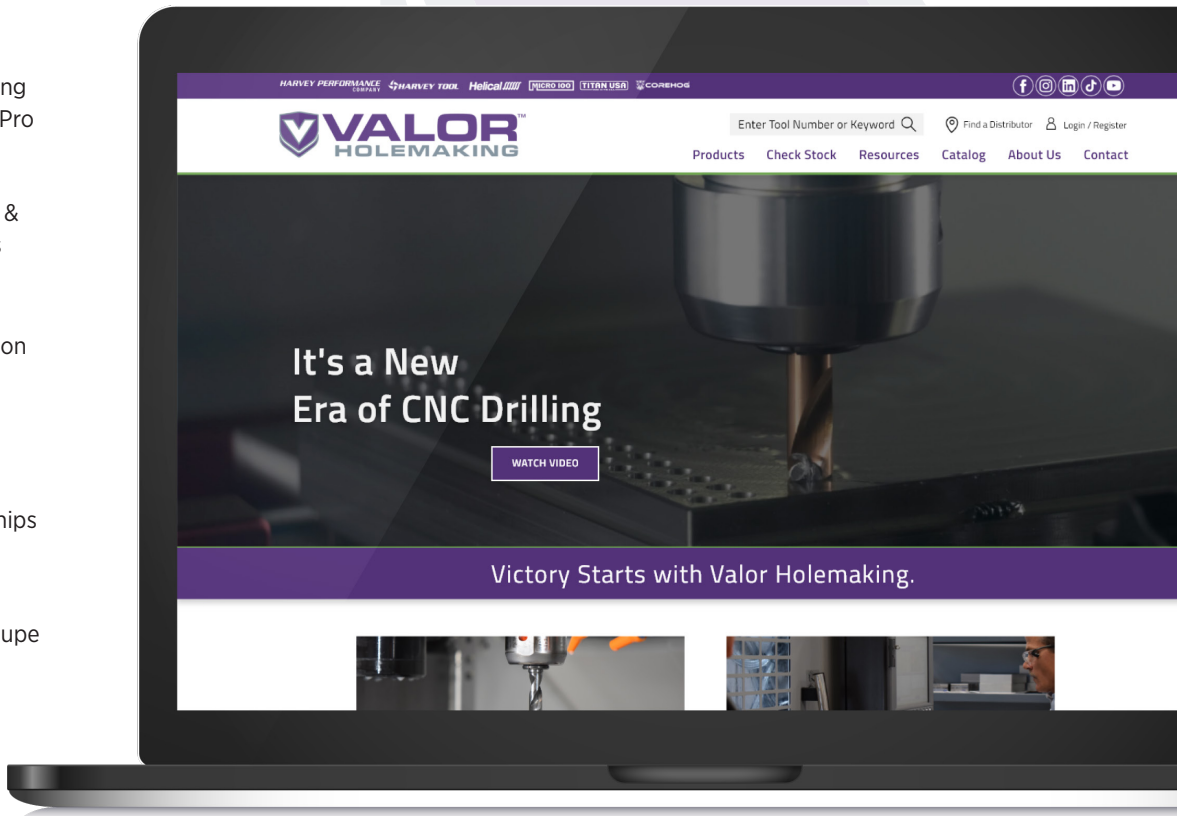
Once logged in, create your own personalized Shopping Cart of the Valor Holemaking tools you're most interested in, then send it directly to a participating distributor, or share it with a colleague or purchasing agent.

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.

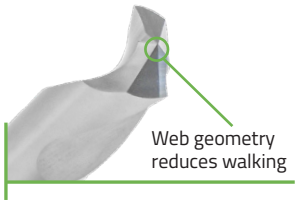
Find the perfect Valor Holemaking tool for your job quickly and easily by using the filtering functionality on each product table, sorting through an expansive and always growing product offering.

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

Point Angle	Drill Diameter		Flute Length (inclusive of point angle)		Point Angle Length	Shank Dia.	Overall Length	Uncoated (Excellent for aluminum and non-ferrous alloys)		Val-Max X Coated (Outstanding in ferrous materials)	
	inch	metric	inch	metric							
A +2° −0°		D1 (h8)*		L2	L4	D2 (h6)*	L1	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

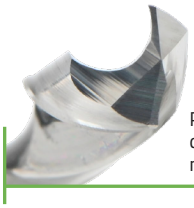
High Performance Spotting Drills

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**.



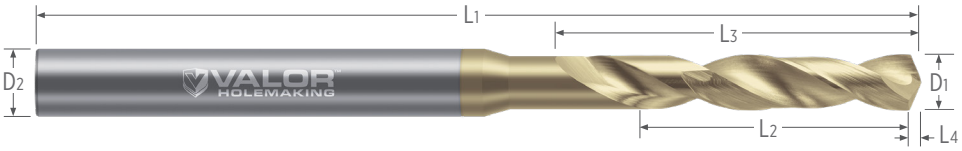
Point geometry designed to minimize burrs

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	.187	**4.75 mm**	**(3x)**	6.17 mm	.33 mm	3 mm	63 mm	V194685	43.50	V194685-V	49.00
.0625 (1/16)	1.587 mm	.312	**7.95 mm**	**(5x)**	9.51 mm	.33 mm	3 mm	63 mm	V810911	80.00	V810911-V	85.50
.0630	1.600 mm	.188	**4.80 mm**	**(3x)**	6.22 mm	.33 mm	3 mm	63 mm	V350774	43.50	V350774-V	49.00
.0630	1.600 mm	.314	**8.00 mm**	**(5x)**	9.58 mm	.33 mm	3 mm	63 mm	V440239	80.00	V440239-V	85.50
.0669	1.700 mm	.200	**5.10 mm**	**(3x)**	6.61 mm	.35 mm	3 mm	63 mm	V912750	43.50	V912750-V	49.00
.0669	1.700 mm	.334	**8.50 mm**	**(5x)**	10.18 mm	.35 mm	3 mm	63 mm	V962712	80.00	V962712-V	85.50
.0708	1.800 mm	.212	**5.40 mm**	**(3x)**	7.00 mm	.37 mm	3 mm	63 mm	V354482	43.50	V354482-V	49.00
.0708	1.800 mm	.354	**9.00 mm**	**(5x)**	10.78 mm	.37 mm	3 mm	63 mm	V269342	80.00	V269342-V	85.50
.0748	1.900 mm	.224	**5.70 mm**	**(3x)**	7.39 mm	.39 mm	3 mm	63 mm	V491940	43.50	V491940-V	49.00
.0748	1.900 mm	.374	**9.50 mm**	**(5x)**	11.38 mm	.39 mm	3 mm	63 mm	V732481	80.00	V732481-V	85.50
.0781 (5/64)	1.984 mm	.234	**5.95 mm**	**(3x)**	7.72 mm	.41 mm	3 mm	63 mm	V380076	43.50	V380076-V	49.00
.0781 (5/64)	1.984 mm	.389	**9.90 mm**	**(5x)**	11.88 mm	.41 mm	3 mm	63 mm	V870254	80.00	V870254-V	85.50
.0787	2.000 mm	.236	**6.00 mm**	**(3x)**	7.78 mm	.41 mm	3 mm	63 mm	V692266	43.50	V692266-V	49.00
.0787	2.000 mm	.393	**10.00 mm**	**(5x)**	11.98 mm	.41 mm	3 mm	63 mm	V843172	80.00	V843172-V	85.50
.0826	2.100 mm	.248	**6.30 mm**	**(3x)**	8.17 mm	.43 mm	3 mm	63 mm	V352580	43.50	V352580-V	49.00
.0826	2.100 mm	.413	**10.50 mm**	**(5x)**	12.58 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	.259	**6.60 mm**	**(3x)**	8.56 mm	.46 mm	3 mm	63 mm	V666234	43.50	V666234-V	49.00
.0866	2.200 mm	.433	**11.00 mm**	**(5x)**	13.18 mm	.46 mm	3 mm	63 mm	V259897	80.00	V259897-V	85.50
.0905	2.300 mm	.271	**6.90 mm**	**(3x)**	8.95 mm	.48 mm	3 mm	63 mm	V599496	43.50	V599496-V	49.00
.0905	2.300 mm	.452	**11.50 mm**	**(5x)**	13.78 mm	.48 mm	3 mm	63 mm	V652049	80.00	V652049-V	85.50
.0937 (3/32)	2.381 mm	.281	**7.15 mm**	**(3x)**	9.26 mm	.49 mm	3 mm	63 mm	V538054	43.50	V538054-V	49.00
.0937 (3/32)	2.381 mm	.468	**11.90 mm**	**(5x)**	14.26 mm	.49 mm	3 mm	63 mm	V572375	80.00	V572375-V	85.50
.0944	2.400 mm	.283	**7.20 mm**	**(3x)**	9.34 mm	.50 mm	3 mm	63 mm	V431788	43.50	V431788-V	49.00
.0944	2.400 mm	.472	**12.00 mm**	**(5x)**	14.38 mm	.50 mm	3 mm	63 mm	V785917	80.00	V785917-V	85.50
.0984	2.500 mm	.295	**7.50 mm**	**(3x)**	9.73 mm	.52 mm	3 mm	63 mm	V536698	43.50	V536698-V	49.00
.0984	2.500 mm	.492	**12.50 mm**	**(5x)**	14.98 mm	.52 mm	3 mm	63 mm	V445649	80.00	V445649-V	85.50
.1023	2.600 mm	.307	**7.80 mm**	**(3x)**	10.12 mm	.54 mm	3 mm	63 mm	V315845	43.50	V315845-V	49.00
.1023	2.600 mm	.511	**13.00 mm**	**(5x)**	15.58 mm	.54 mm	3 mm	63 mm	V788414	80.00	V788414-V	85.50
.1062	2.700 mm	.318	**8.10 mm**	**(3x)**	10.50 mm	.56 mm	3 mm	63 mm	V481040	43.50	V481040-V	49.00
.1062	2.700 mm	.531	**13.50 mm**	**(5x)**	16.17 mm	.56 mm	3 mm	63 mm	V165528	80.00	V165528-V	85.50
.1093 (7/64)	2.778 mm	.328	**8.35 mm**	**(3x)**	10.81 mm	.58 mm	3 mm	63 mm	V954203	43.50	V954203-V	49.00
.1093 (7/64)	2.778 mm	.547	**13.90 mm**	**(5x)**	16.64 mm	.58 mm	3 mm	63 mm	V195817	80.00	V195817-V	85.50
.1102	2.800 mm	.330	**8.40 mm**	**(3x)**	10.89 mm	.58 mm	3 mm	63 mm	V838163	43.50	V838163-V	49.00
.1102	2.800 mm	.551	**14.00 mm**	**(5x)**	16.77 mm	.58 mm	3 mm	63 mm	V802613	80.00	V802613-V	85.50
.1141	2.900 mm	.342	**8.70 mm**	**(3x)**	11.28 mm	.60 mm	3 mm	63 mm	V729681	43.50	V729681-V	49.00
.1141	2.900 mm	.570	**14.50 mm**	**(5x)**	17.37 mm	.60 mm	3 mm	63 mm	V960568	80.00	V960568-V	85.50
.1181	3.000 mm	.354	**9.00 mm**	**(3x)**	11.67 mm	.62 mm	4 mm	63 mm	V438428	43.50	V438428-V	50.00
.1181	3.000 mm	.590	**15.00 mm**	**(5x)**	17.97 mm	.62 mm	4 mm	63 mm	V116498	80.00	V116498-V	86.50
.1220	3.100 mm	.366	**9.30 mm**	**(3x)**	12.06 mm	.64 mm	4 mm	63 mm	V793541	43.50	V793541-V	50.00
.1220	3.100 mm	.610	**15.50 mm**	**(5x)**	18.57 mm	.64 mm	4 mm	63 mm	V569668	80.00	V569668-V	86.50
.1250 (1/8)	3.175 mm	.374	**9.50 mm**	**(3x)**	12.35 mm	.66 mm	4 mm	63 mm	V367456	43.50	V367456-V	50.00
.1250 (1/8)	3.175 mm	.625	**15.90 mm**	**(5x)**	19.02 mm	.66 mm	4 mm	63 mm	V844439	80.00	V844439-V	86.50
.1260	3.200 mm	.377	**9.60 mm**	**(3x)**	12.45 mm	.66 mm	4 mm	63 mm	V660156	43.50	V660156-V	50.00
.1260	3.200 mm	.629	**16.00 mm**	**(5x)**	19.17 mm	.66 mm	4 mm	63 mm	V390641	80.00	V390641-V	86.50
.1300	3.300 mm	.389	**9.90 mm**	**(3x)**	12.84 mm	.68 mm	4 mm	63 mm	V171897	43.50	V171897-V	50.00
.1300	3.300 mm	.649	**16.50 mm**	**(5x)**	19.77 mm	.68 mm	4 mm	63 mm	V999845	80.00	V999845-V	86.50
.1338	3.400 mm	.401	**10.20 mm**	**(3x)**	13.23 mm	.70 mm	4 mm	63 mm	V781405	43.50	V781405-V	50.00
.1338	3.400 mm	.669	**17.00 mm**	**(5x)**	20.37 mm	.70 mm	4 mm	63 mm	V262808	80.00	V262808-V	86.50
.1377	3.500 mm	.413	**10.50 mm**	**(3x)**	13.62 mm	.72 mm	4 mm	63 mm	V839259	43.50	V839259-V	50.00
.1377	3.500 mm	.688	**17.50 mm**	**(5x)**	20.97 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	.421	**10.70 mm**	(3x)	13.89 mm	.74 mm	4 mm	63 mm	V740344	43.50	V740344-V	50.00
.1406 (9/64)	3.571 mm	.702	**17.85 mm**	(5x)	21.39 mm	.74 mm	4 mm	63 mm	V747490	80.00	V747490-V	86.50
.1417	3.600 mm	.425	**10.80 mm**	(3x)	14.01 mm	.75 mm	4 mm	63 mm	V137136	43.50	V137136-V	50.00
.1417	3.600 mm	.708	**18.00 mm**	(5x)	21.57 mm	.75 mm	4 mm	63 mm	V813201	80.00	V813201-V	86.50
.1456	3.700 mm	.437	**11.10 mm**	(3x)	14.40 mm	.77 mm	4 mm	63 mm	V282861	43.50	V282861-V	50.00
.1456	3.700 mm	.728	**18.50 mm**	(5x)	22.17 mm	.77 mm	4 mm	63 mm	V334748	80.00	V334748-V	86.50
.1496	3.800 mm	.448	**11.40 mm**	(3x)	14.79 mm	.79 mm	4 mm	63 mm	V728547	43.50	V728547-V	50.00
.1496	3.800 mm	.748	**19.00 mm**	(5x)	22.77 mm	.79 mm	4 mm	63 mm	V454017	80.00	V454017-V	86.50
.1535	3.900 mm	.460	**11.70 mm**	(3x)	15.18 mm	.81 mm	4 mm	63 mm	V438470	43.50	V438470-V	50.00
.1535	3.900 mm	.767	**19.50 mm**	(5x)	23.37 mm	.81 mm	4 mm	63 mm	V878966	80.00	V878966-V	86.50
.1562 (5/32)	3.968 mm	.468	**11.90 mm**	(3x)	15.44 mm	.82 mm	4 mm	63 mm	V648893	43.50	V648893-V	50.00
.1562 (5/32)	3.968 mm	.781	**19.85 mm**	(5x)	23.77 mm	.82 mm	4 mm	63 mm	V458952	80.00	V458952-V	86.50
.1574	4.000 mm	.472	**12.00 mm**	(3x)	15.56 mm	.83 mm	6 mm	63 mm	V421509	43.50	V421509-V	51.00
.1574	4.000 mm	.787	**20.00 mm**	(5x)	23.96 mm	.83 mm	6 mm	75 mm	V338334	80.00	V338334-V	87.50
.1614	4.100 mm	.484	**12.30 mm**	(3x)	15.95 mm	.85 mm	6 mm	63 mm	V174492	50.50	V174492-V	58.00
.1614	4.100 mm	.807	**20.50 mm**	(5x)	24.56 mm	.85 mm	6 mm	75 mm	V885910	87.50	V885910-V	95.00
.1653	4.200 mm	.496	**12.60 mm**	(3x)	16.34 mm	.87 mm	6 mm	63 mm	V106883	50.50	V106883-V	58.00
.1653	4.200 mm	.826	**21.00 mm**	(5x)	25.16 mm	.87 mm	6 mm	75 mm	V261808	87.50	V261808-V	95.00
.1692	4.300 mm	.507	**12.90 mm**	(3x)	16.73 mm	.89 mm	6 mm	63 mm	V831806	50.50	V831806-V	58.00
.1692	4.300 mm	.846	**21.50 mm**	(5x)	25.76 mm	.89 mm	6 mm	75 mm	V911321	87.50	V911321-V	95.00
.1718 (11/64)	4.365 mm	.515	**13.10 mm**	(3x)	16.99 mm	.90 mm	6 mm	63 mm	V639993	50.50	V639993-V	58.00
.1718 (11/64)	4.365 mm	.860	**21.85 mm**	(5x)	26.15 mm	.90 mm	6 mm	75 mm	V374159	87.50	V374159-V	95.00
.1732	4.400 mm	.519	**13.20 mm**	(3x)	17.12 mm	.91 mm	6 mm	63 mm	V582968	50.50	V582968-V	58.00
.1732	4.400 mm	.866	**22.00 mm**	(5x)	26.36 mm	.91 mm	6 mm	75 mm	V197740	87.50	V197740-V	95.00
.1771	4.500 mm	.531	**13.50 mm**	(3x)	17.51 mm	.93 mm	6 mm	63 mm	V956195	50.50	V956195-V	58.00
.1771	4.500 mm	.885	**22.50 mm**	(5x)	26.96 mm	.93 mm	6 mm	75 mm	V441617	87.50	V441617-V	95.00
.1811	4.600 mm	.543	**13.80 mm**	(3x)	17.90 mm	.95 mm	6 mm	63 mm	V866527	50.50	V866527-V	58.00
.1811	4.600 mm	.905	**23.00 mm**	(5x)	27.56 mm	.95 mm	6 mm	75 mm	V224773	87.50	V224773-V	95.00
.1850	4.700 mm	.555	**14.10 mm**	(3x)	18.29 mm	.97 mm	6 mm	63 mm	V344265	50.50	V344265-V	58.00
.1850	4.700 mm	.925	**23.50 mm**	(5x)	28.16 mm	.97 mm	6 mm	75 mm	V433090	87.50	V433090-V	95.00
.1875 (3/16)	4.762 mm	.562	**14.30 mm**	(3x)	18.53 mm	.99 mm	6 mm	63 mm	V850660	50.50	V850660-V	58.00
.1875 (3/16)	4.762 mm	.937	**23.80 mm**	(5x)	28.53 mm	.99 mm	6 mm	75 mm	V771194	87.50	V771194-V	95.00
.1890	4.800 mm	.566	**14.40 mm**	(3x)	18.68 mm	.99 mm	6 mm	63 mm	V568557	50.50	V568557-V	58.00
.1890	4.800 mm	.944	**24.00 mm**	(5x)	28.76 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	.578	**14.70 mm**	**(3x)**	19.07 mm	1.01 mm	6 mm	63 mm	V728480	50.50	V728480-V	58.00
.1930	4.900 mm	.964	**24.50 mm**	**(5x)**	29.36 mm	1.01 mm	6 mm	75 mm	V367252	87.50	V367252-V	95.00
.1968	5.000 mm	.590	**15.00 mm**	**(3x)**	19.46 mm	1.04 mm	6 mm	63 mm	V330699	50.50	V330699-V	58.00
.1968	5.000 mm	.984	**25.00 mm**	**(5x)**	29.96 mm	1.04 mm	6 mm	75 mm	V234458	87.50	V234458-V	95.00
.2007	5.100 mm	.602	**15.30 mm**	**(3x)**	19.85 mm	1.06 mm	6 mm	63 mm	V368184	50.50	V368184-V	58.00
.2007	5.100 mm	1.003	**25.50 mm**	**(5x)**	30.56 mm	1.06 mm	6 mm	75 mm	V224687	87.50	V224687-V	95.00
.2031 (13/64)	5.159 mm	.610	**15.50 mm**	**(3x)**	20.08 mm	1.07 mm	6 mm	63 mm	V977882	50.50	V977882-V	58.00
.2031 (13/64)	5.159 mm	1.015	**25.80 mm**	**(5x)**	30.91 mm	1.07 mm	6 mm	75 mm	V420736	87.50	V420736-V	95.00
.2047	5.200 mm	.614	**15.60 mm**	**(3x)**	20.24 mm	1.08 mm	6 mm	63 mm	V485216	50.50	V485216-V	58.00
.2047	5.200 mm	1.023	**26.00 mm**	**(5x)**	31.16 mm	1.08 mm	6 mm	75 mm	V357300	87.50	V357300-V	95.00
.2086	5.300 mm	.625	**15.90 mm**	**(3x)**	20.63 mm	1.10 mm	6 mm	63 mm	V110782	50.50	V110782-V	58.00
.2086	5.300 mm	1.043	**26.50 mm**	**(5x)**	31.76 mm	1.10 mm	6 mm	75 mm	V727361	87.50	V727361-V	95.00
.2125	5.400 mm	.637	**16.20 mm**	**(3x)**	21.01 mm	1.12 mm	6 mm	63 mm	V836676	50.50	V836676-V	58.00
.2125	5.400 mm	1.062	**27.00 mm**	**(5x)**	32.35 mm	1.12 mm	6 mm	75 mm	V834281	87.50	V834281-V	95.00
.2165	5.500 mm	.649	**16.50 mm**	**(3x)**	21.40 mm	1.14 mm	6 mm	63 mm	V106542	50.50	V106542-V	58.00
.2165	5.500 mm	1.082	**27.50 mm**	**(5x)**	32.95 mm	1.14 mm	6 mm	75 mm	V492013	87.50	V492013-V	95.00
.2187 (7/32)	5.556 mm	.655	**16.65 mm**	**(3x)**	21.62 mm	1.15 mm	6 mm	63 mm	V656902	50.50	V656902-V	58.00
.2187 (7/32)	5.556 mm	1.094	**27.80 mm**	**(5x)**	33.29 mm	1.15 mm	6 mm	75 mm	V700600	87.50	V700600-V	95.00
.2205	5.600 mm	.661	**16.80 mm**	**(3x)**	21.79 mm	1.16 mm	6 mm	63 mm	V770182	50.50	V770182-V	58.00
.2205	5.600 mm	1.102	**28.00 mm**	**(5x)**	33.55 mm	1.16 mm	6 mm	75 mm	V896743	87.50	V896743-V	95.00
.2244	5.700 mm	.673	**17.10 mm**	**(3x)**	22.18 mm	1.18 mm	6 mm	63 mm	V403734	50.50	V403734-V	58.00
.2244	5.700 mm	1.122	**28.50 mm**	**(5x)**	34.15 mm	1.18 mm	6 mm	75 mm	V770664	87.50	V770664-V	95.00
.2283	5.800 mm	.685	**17.40 mm**	**(3x)**	22.57 mm	1.20 mm	6 mm	63 mm	V899133	50.50	V899133-V	58.00
.2283	5.800 mm	1.141	**29.00 mm**	**(5x)**	34.75 mm	1.20 mm	6 mm	75 mm	V380680	87.50	V380680-V	95.00
.2322	5.900 mm	.696	**17.70 mm**	**(3x)**	22.96 mm	1.22 mm	6 mm	63 mm	V590239	50.50	V590239-V	58.00
.2322	5.900 mm	1.161	**29.50 mm**	**(5x)**	35.35 mm	1.22 mm	6 mm	75 mm	V537399	87.50	V537399-V	95.00
.2343 (15/64)	5.953 mm	.702	**17.85 mm**	**(3x)**	23.17 mm	1.23 mm	6 mm	63 mm	V353700	50.50	V353700-V	58.00
.2343 (15/64)	5.953 mm	1.171	**29.75 mm**	**(5x)**	35.67 mm	1.23 mm	6 mm	75 mm	V430775	87.50	V430775-V	95.00
.2362	6.000 mm	.708	**18.00 mm**	**(3x)**	23.35 mm	1.24 mm	8 mm	75 mm	V234178	50.50	V234178-V	59.50
.2362	6.000 mm	1.181	**30.00 mm**	**(5x)**	35.95 mm	1.24 mm	8 mm	100 mm	V927207	87.50	V927207-V	97.50
.2401	6.100 mm	.720	**18.30 mm**	**(3x)**	23.74 mm	1.26 mm	8 mm	75 mm	V524686	53.00	V524686-V	62.00
.2401	6.100 mm	1.200	**30.50 mm**	**(5x)**	36.55 mm	1.26 mm	8 mm	100 mm	V699896	101.50	V699896-V	111.50
.2440	6.200 mm	.732	**18.60 mm**	**(3x)**	24.13 mm	1.28 mm	8 mm	75 mm	V147676	53.00	V147676-V	62.00
.2440	6.200 mm	1.220	**31.00 mm**	**(5x)**	37.15 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	.744	**18.90 mm**	**(3x)**	24.52 mm	1.30 mm	8 mm	75 mm	V627609	53.00	V627609-V	62.00
.2480	6.300 mm	1.240	**31.50 mm**	**(5x)**	37.75 mm	1.30 mm	8 mm	100 mm	V753195	101.50	V753195-V	111.50
.2500 (1/4)	6.350 mm	.749	**19.05 mm**	**(3x)**	24.71 mm	1.32 mm	8 mm	75 mm	V463324	53.00	V463324-V	62.00
.2500 (1/4)	6.350 mm	1.249	**31.75 mm**	**(5x)**	38.05 mm	1.32 mm	8 mm	100 mm	V890966	101.50	V890966-V	111.50
.2520	6.400 mm	.755	**19.20 mm**	**(3x)**	24.91 mm	1.33 mm	8 mm	75 mm	V470320	53.00	V470320-V	62.00
.2520	6.400 mm	1.259	**32.00 mm**	**(5x)**	38.35 mm	1.33 mm	8 mm	100 mm	V610421	101.50	V610421-V	111.50
.2559	6.500 mm	.767	**19.50 mm**	**(3x)**	25.30 mm	1.35 mm	8 mm	75 mm	V904272	53.00	V904272-V	62.00
.2559	6.500 mm	1.279	**32.50 mm**	**(5x)**	38.95 mm	1.35 mm	8 mm	100 mm	V503831	101.50	V503831-V	111.50
.2598	6.600 mm	.779	**19.80 mm**	**(3x)**	25.69 mm	1.37 mm	8 mm	75 mm	V591811	53.00	V591811-V	62.00
.2598	6.600 mm	1.299	**33.00 mm**	**(5x)**	39.55 mm	1.37 mm	8 mm	100 mm	V548894	101.50	V548894-V	111.50
.2638	6.700 mm	.791	**20.10 mm**	**(3x)**	26.07 mm	1.39 mm	8 mm	75 mm	V863925	53.00	V863925-V	62.00
.2638	6.700 mm	1.318	**33.50 mm**	**(5x)**	40.14 mm	1.39 mm	8 mm	100 mm	V956352	101.50	V956352-V	111.50
.2656 (17/64)	6.746 mm	.797	**20.25 mm**	**(3x)**	26.25 mm	1.40 mm	8 mm	75 mm	V230372	53.00	V230372-V	62.00
.2656 (17/64)	6.746 mm	1.328	**33.75 mm**	**(5x)**	40.42 mm	1.40 mm	8 mm	100 mm	V330745	101.50	V330745-V	111.50
.2677	6.800 mm	.803	**20.40 mm**	**(3x)**	26.46 mm	1.41 mm	8 mm	75 mm	V586533	53.00	V586533-V	62.00
.2677	6.800 mm	1.338	**34.00 mm**	**(5x)**	40.74 mm	1.41 mm	8 mm	100 mm	V112067	101.50	V112067-V	111.50
.2717	6.900 mm	.814	**20.70 mm**	**(3x)**	26.85 mm	1.43 mm	8 mm	75 mm	V585346	53.00	V585346-V	62.00
.2717	6.900 mm	1.358	**34.50 mm**	**(5x)**	41.34 mm	1.43 mm	8 mm	100 mm	V766452	101.50	V766452-V	111.50
.2756	7.000 mm	.826	**21.00 mm**	**(3x)**	27.24 mm	1.45 mm	8 mm	75 mm	V793057	53.00	V793057-V	62.00
.2756	7.000 mm	1.377	**35.00 mm**	**(5x)**	41.94 mm	1.45 mm	8 mm	100 mm	V812884	101.50	V812884-V	111.50
.2795	7.100 mm	.838	**21.30 mm**	**(3x)**	27.63 mm	1.47 mm	8 mm	75 mm	V971883	55.00	V971883-V	64.00
.2795	7.100 mm	1.397	**35.50 mm**	**(5x)**	42.54 mm	1.47 mm	8 mm	100 mm	V526212	103.50	V526212-V	113.50
.2812 (9/32)	7.142 mm	.844	**21.45 mm**	**(3x)**	27.79 mm	1.48 mm	8 mm	75 mm	V745358	55.00	V745358-V	64.00
.2812 (9/32)	7.142 mm	1.405	**35.70 mm**	**(5x)**	42.79 mm	1.48 mm	8 mm	100 mm	V974925	103.50	V974925-V	113.50
.2834	7.200 mm	.850	**21.60 mm**	**(3x)**	28.02 mm	1.49 mm	8 mm	75 mm	V318182	55.00	V318182-V	64.00
.2834	7.200 mm	1.417	**36.00 mm**	**(5x)**	43.14 mm	1.49 mm	8 mm	100 mm	V243742	103.50	V243742-V	113.50
.2874	7.300 mm	.862	**21.90 mm**	**(3x)**	28.41 mm	1.51 mm	8 mm	75 mm	V400766	55.00	V400766-V	64.00
.2874	7.300 mm	1.437	**36.50 mm**	**(5x)**	43.74 mm	1.51 mm	8 mm	100 mm	V340474	103.50	V340474-V	113.50
.2913	7.400 mm	.874	**22.20 mm**	**(3x)**	28.80 mm	1.53 mm	8 mm	75 mm	V583325	55.00	V583325-V	64.00
.2913	7.400 mm	1.456	**37.00 mm**	**(5x)**	44.34 mm	1.53 mm	8 mm	100 mm	V884228	103.50	V884228-V	113.50
.2952	7.500 mm	.885	**22.50 mm**	**(3x)**	29.19 mm	1.55 mm	8 mm	75 mm	V833945	55.00	V833945-V	64.00
.2952	7.500 mm	1.476	**37.50 mm**	**(5x)**	44.94 mm	1.55 mm	8 mm	100 mm	V759862	103.50	V759862-V	113.50
.2969 (19/64)	7.541 mm	.889	**22.60 mm**	**(3x)**	29.35 mm	1.56 mm	8 mm	75 mm	V222380	55.00	V222380-V	64.00
.2969 (19/64)	7.541 mm	1.484	**37.70 mm**	**(5x)**	45.18 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	.897	**22.80 mm**	**(3x)**	29.58 mm	1.57 mm	8 mm	75 mm	V931842	55.00	V931842-V	64.00
.2992	7.600 mm	1.496	**38.00 mm**	**(5x)**	45.54 mm	1.57 mm	8 mm	100 mm	V883385	103.50	V883385-V	113.50
.3031	7.700 mm	.909	**23.10 mm**	**(3x)**	29.97 mm	1.59 mm	8 mm	75 mm	V649826	55.00	V649826-V	64.00
.3031	7.700 mm	1.515	**38.50 mm**	**(5x)**	46.14 mm	1.59 mm	8 mm	100 mm	V696121	103.50	V696121-V	113.50
.3071	7.800 mm	.921	**23.40 mm**	**(3x)**	30.36 mm	1.62 mm	8 mm	75 mm	V402097	55.00	V402097-V	64.00
.3071	7.800 mm	1.535	**39.00 mm**	**(5x)**	46.74 mm	1.62 mm	8 mm	100 mm	V914982	103.50	V914982-V	113.50
.3110	7.900 mm	.933	**23.70 mm**	**(3x)**	30.75 mm	1.64 mm	8 mm	75 mm	V217709	55.00	V217709-V	64.00
.3110	7.900 mm	1.555	**39.50 mm**	**(5x)**	47.34 mm	1.64 mm	8 mm	100 mm	V960211	103.50	V960211-V	113.50
.3125 (5/16)	7.937 mm	.937	**23.80 mm**	**(3x)**	30.89 mm	1.64 mm	8 mm	75 mm	V785367	55.00	V785367-V	64.00
.3125 (5/16)	7.937 mm	1.562	**39.70 mm**	**(5x)**	47.56 mm	1.64 mm	8 mm	100 mm	V504447	103.50	V504447-V	113.50
.3150	8.000 mm	.944	**24.00 mm**	**(3x)**	31.13 mm	1.66 mm	10 mm	75 mm	V899583	55.00	V899583-V	66.00
.3150	8.000 mm	1.574	**40.00 mm**	**(5x)**	47.93 mm	1.66 mm	10 mm	100 mm	V959977	103.50	V959977-V	115.00
.3189	8.100 mm	.956	**24.30 mm**	**(3x)**	31.52 mm	1.68 mm	10 mm	75 mm	V926444	62.50	V926444-V	73.50
.3189	8.100 mm	1.594	**40.50 mm**	**(5x)**	48.53 mm	1.68 mm	10 mm	100 mm	V759625	122.00	V759625-V	133.50
.3228	8.200 mm	.968	**24.60 mm**	**(3x)**	31.91 mm	1.70 mm	10 mm	75 mm	V724837	62.50	V724837-V	73.50
.3228	8.200 mm	1.614	**41.00 mm**	**(5x)**	49.13 mm	1.70 mm	10 mm	100 mm	V873208	122.00	V873208-V	133.50
.3268	8.300 mm	.980	**24.90 mm**	**(3x)**	32.30 mm	1.72 mm	10 mm	75 mm	V555652	62.50	V555652-V	73.50
.3268	8.300 mm	1.633	**41.50 mm**	**(5x)**	49.73 mm	1.72 mm	10 mm	100 mm	V573287	122.00	V573287-V	133.50
.3281 (21/64)	8.333 mm	.984	**25.00 mm**	**(3x)**	32.43 mm	1.73 mm	10 mm	75 mm	V733277	62.50	V733277-V	73.50
.3281 (21/64)	8.333 mm	1.639	**41.65 mm**	**(5x)**	49.93 mm	1.73 mm	10 mm	100 mm	V919579	122.00	V919579-V	133.50
.3307	8.400 mm	.992	**25.20 mm**	**(3x)**	32.69 mm	1.74 mm	10 mm	75 mm	V167766	62.50	V167766-V	73.50
.3307	8.400 mm	1.653	**42.00 mm**	**(5x)**	50.33 mm	1.74 mm	10 mm	100 mm	V633981	122.00	V633981-V	133.50
.3346	8.500 mm	1.003	**25.50 mm**	**(3x)**	33.08 mm	1.76 mm	10 mm	75 mm	V408664	62.50	V408664-V	73.50
.3346	8.500 mm	1.673	**42.50 mm**	**(5x)**	50.93 mm	1.76 mm	10 mm	100 mm	V861150	122.00	V861150-V	133.50
.3386	8.600 mm	1.015	**25.80 mm**	**(3x)**	33.47 mm	1.78 mm	10 mm	75 mm	V390096	62.50	V390096-V	73.50
.3386	8.600 mm	1.692	**43.00 mm**	**(5x)**	51.53 mm	1.78 mm	10 mm	100 mm	V844326	122.00	V844326-V	133.50
.3425	8.700 mm	1.027	**26.10 mm**	**(3x)**	33.86 mm	1.80 mm	10 mm	75 mm	V151969	62.50	V151969-V	73.50
.3425	8.700 mm	1.712	**43.50 mm**	**(5x)**	52.13 mm	1.80 mm	10 mm	100 mm	V879893	122.00	V879893-V	133.50
.3438 (11/32)	8.732 mm	1.031	**26.20 mm**	**(3x)**	33.98 mm	1.81 mm	10 mm	75 mm	V104671	62.50	V104671-V	73.50
.3438 (11/32)	8.732 mm	1.718	**43.65 mm**	**(5x)**	52.32 mm	1.81 mm	10 mm	100 mm	V335452	122.00	V335452-V	133.50
.3465	8.800 mm	1.039	**26.40 mm**	**(3x)**	34.25 mm	1.82 mm	10 mm	75 mm	V891293	62.50	V891293-V	73.50
.3465	8.800 mm	1.732	**44.00 mm**	**(5x)**	52.73 mm	1.82 mm	10 mm	100 mm	V260828	122.00	V260828-V	133.50
.3504	8.900 mm	1.051	**26.70 mm**	**(3x)**	34.64 mm	1.84 mm	10 mm	75 mm	V365922	62.50	V365922-V	73.50
.3504	8.900 mm	1.751	**44.50 mm**	**(5x)**	53.33 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	1.062	**27.00 mm**	**(3x)**	35.03 mm	1.86 mm	10 mm	75 mm	V386241	62.50	V386241-V	73.50
.3543	9.000 mm	1.771	**45.00 mm**	**(5x)**	53.93 mm	1.86 mm	10 mm	100 mm	V656849	122.00	V656849-V	133.50
.3583	9.100 mm	1.074	**27.30 mm**	**(3x)**	35.42 mm	1.88 mm	10 mm	75 mm	V637527	82.00	V637527-V	93.00
.3583	9.100 mm	1.791	**45.50 mm**	**(5x)**	54.53 mm	1.88 mm	10 mm	100 mm	V134756	136.50	V134756-V	148.00
.3594 (23/64)	9.128 mm	1.078	**27.40 mm**	**(3x)**	35.53 mm	1.89 mm	10 mm	75 mm	V324647	82.00	V324647-V	93.00
.3594 (23/64)	9.128 mm	1.797	**45.65 mm**	**(5x)**	54.69 mm	1.89 mm	10 mm	100 mm	V928900	136.50	V928900-V	148.00
.3622	9.200 mm	1.086	**27.60 mm**	**(3x)**	35.81 mm	1.91 mm	10 mm	75 mm	V332586	82.00	V332586-V	93.00
.3622	9.200 mm	1.811	**46.00 mm**	**(5x)**	55.13 mm	1.91 mm	10 mm	100 mm	V326648	136.50	V326648-V	148.00
.3661	9.300 mm	1.098	**27.90 mm**	**(3x)**	36.19 mm	1.93 mm	10 mm	75 mm	V589859	82.00	V589859-V	93.00
.3661	9.300 mm	1.830	**46.50 mm**	**(5x)**	55.72 mm	1.93 mm	10 mm	100 mm	V975106	136.50	V975106-V	148.00
.3701	9.400 mm	1.110	**28.20 mm**	**(3x)**	36.58 mm	1.95 mm	10 mm	75 mm	V656422	82.00	V656422-V	93.00
.3701	9.400 mm	1.850	**47.00 mm**	**(5x)**	56.32 mm	1.95 mm	10 mm	100 mm	V807457	136.50	V807457-V	148.00
.3740	9.500 mm	1.122	**28.50 mm**	**(3x)**	36.97 mm	1.97 mm	10 mm	75 mm	V306233	82.00	V306233-V	93.00
.3740	9.500 mm	1.870	**47.50 mm**	**(5x)**	56.92 mm	1.97 mm	10 mm	100 mm	V983594	136.50	V983594-V	148.00
.3750 (3/8)	9.525 mm	1.125	**28.60 mm**	**(3x)**	37.07 mm	1.97 mm	10 mm	75 mm	V893492	82.00	V893492-V	93.00
.3750 (3/8)	9.525 mm	1.875	**47.65 mm**	**(5x)**	57.07 mm	1.97 mm	10 mm	100 mm	V937306	136.50	V937306-V	148.00
.3780	9.600 mm	1.133	**28.80 mm**	**(3x)**	37.36 mm	1.99 mm	10 mm	75 mm	V883648	82.00	V883648-V	93.00
.3780	9.600 mm	1.889	**48.00 mm**	**(5x)**	57.52 mm	1.99 mm	10 mm	100 mm	V796500	136.50	V796500-V	148.00
.3819	9.700 mm	1.145	**29.10 mm**	**(3x)**	37.75 mm	2.01 mm	10 mm	75 mm	V695542	82.00	V695542-V	93.00
.3819	9.700 mm	1.909	**48.50 mm**	**(5x)**	58.12 mm	2.01 mm	10 mm	100 mm	V247210	136.50	V247210-V	148.00
.3858	9.800 mm	1.157	**29.40 mm**	**(3x)**	38.14 mm	2.03 mm	10 mm	75 mm	V676169	82.00	V676169-V	93.00
.3858	9.800 mm	1.929	**49.00 mm**	**(5x)**	58.72 mm	2.03 mm	10 mm	100 mm	V823528	136.50	V823528-V	148.00
.3898	9.900 mm	1.169	**29.70 mm**	**(3x)**	38.53 mm	2.05 mm	10 mm	75 mm	V263386	82.00	V263386-V	93.00
.3898	9.900 mm	1.948	**49.50 mm**	**(5x)**	59.32 mm	2.05 mm	10 mm	100 mm	V879509	136.50	V879509-V	148.00
.3906 (25/64)	9.921 mm	1.171	**29.75 mm**	**(3x)**	38.61 mm	2.05 mm	10 mm	75 mm	V405503	82.00	V405503-V	93.00
.3906 (25/64)	9.921 mm	1.952	**49.60 mm**	**(5x)**	59.45 mm	2.05 mm	10 mm	100 mm	V287196	136.50	V287196-V	148.00
.3937	10.000 mm	1.181	**30.00 mm**	**(3x)**	38.92 mm	2.07 mm	12 mm	100 mm	V532196	82.00	V532196-V	98.00
.3937	10.000 mm	1.968	**50.00 mm**	**(5x)**	59.92 mm	2.07 mm	12 mm	125 mm	V856596	136.50	V856596-V	153.50
.3976	10.100 mm	1.192	**30.30 mm**	**(3x)**	39.31 mm	2.09 mm	12 mm	100 mm	V621639	105.60	V621639-V	121.50
.3976	10.100 mm	1.988	**50.50 mm**	**(5x)**	60.52 mm	2.09 mm	12 mm	125 mm	V848057	204.60	V848057-V	221.50
.4016	10.200 mm	1.204	**30.60 mm**	**(3x)**	39.70 mm	2.11 mm	12 mm	100 mm	V641835	105.60	V641835-V	121.50
.4016	10.200 mm	2.007	**51.00 mm**	**(5x)**	61.12 mm	2.11 mm	12 mm	125 mm	V210101	204.60	V210101-V	221.50
.4055	10.300 mm	1.216	**30.90 mm**	**(3x)**	40.09 mm	2.13 mm	12 mm	100 mm	V589355	105.60	V589355-V	121.50
.4055	10.300 mm	2.027	**51.50 mm**	**(5x)**	61.72 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	1.218	**30.95 mm**	(3x)	40.15 mm	2.14 mm	12 mm	100 mm	V576080	105.60	V576080-V	121.50
.4062 (13/32)	10.317 mm	2.031	**51.60 mm**	(5x)	61.82 mm	2.14 mm	12 mm	125 mm	V227073	204.60	V227073-V	221.50
.4094	10.400 mm	1.228	**31.20 mm**	(3x)	40.48 mm	2.15 mm	12 mm	100 mm	V708410	105.60	V708410-V	121.50
.4094	10.400 mm	2.047	**52.00 mm**	(5x)	62.32 mm	2.15 mm	12 mm	125 mm	V195280	204.60	V195280-V	221.50
.4134	10.500 mm	1.240	**31.50 mm**	(3x)	40.87 mm	2.17 mm	12 mm	100 mm	V879946	105.60	V879946-V	121.50
.4134	10.500 mm	2.066	**52.50 mm**	(5x)	62.92 mm	2.17 mm	12 mm	125 mm	V496598	204.60	V496598-V	221.50
.4173	10.600 mm	1.251	**31.80 mm**	(3x)	41.26 mm	2.20 mm	12 mm	100 mm	V455218	105.60	V455218-V	121.50
.4173	10.600 mm	2.086	**53.00 mm**	(5x)	63.52 mm	2.20 mm	12 mm	125 mm	V452314	204.60	V452314-V	221.50
.4213	10.700 mm	1.263	**32.10 mm**	(3x)	41.64 mm	2.22 mm	12 mm	100 mm	V155404	105.60	V155404-V	121.50
.4213	10.700 mm	2.106	**53.50 mm**	(5x)	64.11 mm	2.22 mm	12 mm	125 mm	V634560	204.60	V634560-V	221.50
.4219 (27/64)	10.716 mm	1.265	**32.15 mm**	(3x)	41.71 mm	2.22 mm	12 mm	100 mm	V826638	105.60	V826638-V	121.50
.4219 (27/64)	10.716 mm	2.110	**53.60 mm**	(5x)	64.21 mm	2.22 mm	12 mm	125 mm	V814056	204.60	V814056-V	221.50
.4252	10.800 mm	1.275	**32.40 mm**	(3x)	42.03 mm	2.24 mm	12 mm	100 mm	V213641	105.60	V213641-V	121.50
.4252	10.800 mm	2.125	**54.00 mm**	(5x)	64.71 mm	2.24 mm	12 mm	125 mm	V455956	204.60	V455956-V	221.50
.4291	10.900 mm	1.287	**32.70 mm**	(3x)	42.42 mm	2.26 mm	12 mm	100 mm	V681558	105.60	V681558-V	121.50
.4291	10.900 mm	2.145	**54.50 mm**	(5x)	65.31 mm	2.26 mm	12 mm	125 mm	V872776	204.60	V872776-V	221.50
.4331	11.000 mm	1.299	**33.00 mm**	(3x)	42.81 mm	2.28 mm	12 mm	100 mm	V486441	105.60	V486441-V	121.50
.4331	11.000 mm	2.165	**55.00 mm**	(5x)	65.91 mm	2.28 mm	12 mm	125 mm	V840142	204.60	V840142-V	221.50
.4370	11.100 mm	1.311	**33.30 mm**	(3x)	43.20 mm	2.30 mm	12 mm	100 mm	V569821	115.00	V569821-V	131.00
.4370	11.100 mm	2.185	**55.50 mm**	(5x)	66.51 mm	2.30 mm	12 mm	125 mm	V786789	210.00	V786789-V	227.00
.4375 (7/16)	11.112 mm	1.312	**33.35 mm**	(3x)	43.25 mm	2.30 mm	12 mm	100 mm	V194265	115.00	V194265-V	131.00
.4375 (7/16)	11.112 mm	2.187	**55.55 mm**	(5x)	66.58 mm	2.30 mm	12 mm	125 mm	V266796	210.00	V266796-V	227.00
.4409	11.200 mm	1.322	**33.60 mm**	(3x)	43.59 mm	2.32 mm	12 mm	100 mm	V800667	115.00	V800667-V	131.00
.4409	11.200 mm	2.204	**56.00 mm**	(5x)	67.11 mm	2.32 mm	12 mm	125 mm	V503159	210.00	V503159-V	227.00
.4449	11.300 mm	1.334	**33.90 mm**	(3x)	43.98 mm	2.34 mm	12 mm	100 mm	V309259	115.00	V309259-V	131.00
.4449	11.300 mm	2.224	**56.50 mm**	(5x)	67.71 mm	2.34 mm	12 mm	125 mm	V346861	210.00	V346861-V	227.00
.4488	11.400 mm	1.346	**34.20 mm**	(3x)	44.37 mm	2.36 mm	12 mm	100 mm	V434511	115.00	V434511-V	131.00
.4488	11.400 mm	2.244	**57.00 mm**	(5x)	68.31 mm	2.36 mm	12 mm	125 mm	V662862	210.00	V662862-V	227.00
.4527	11.500 mm	1.358	**34.50 mm**	(3x)	44.76 mm	2.38 mm	12 mm	100 mm	V848030	115.00	V848030-V	131.00
.4527	11.500 mm	2.263	**57.50 mm**	(5x)	68.91 mm	2.38 mm	12 mm	125 mm	V786485	210.00	V786485-V	227.00
.4531 (29/64)	11.508 mm	1.358	**34.50 mm**	(3x)	44.79 mm	2.38 mm	12 mm	100 mm	V293298	115.00	V293298-V	131.00
.4531 (29/64)	11.508 mm	2.265	**57.55 mm**	(5x)	68.96 mm	2.38 mm	12 mm	125 mm	V128189	210.00	V128189-V	227.00
.4567	11.600 mm	1.370	**34.80 mm**	(3x)	45.15 mm	2.40 mm	12 mm	100 mm	V713188	115.00	V713188-V	131.00
.4567	11.600 mm	2.283	**58.00 mm**	(5x)	69.51 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	1.381	**35.10 mm**	(3x)	45.54 mm	2.42 mm	12 mm	100 mm	V136399	115.00	V136399-V	131.00
.4606	11.700 mm	2.303	**58.50 mm**	(5x)	70.11 mm	2.42 mm	12 mm	125 mm	V357863	210.00	V357863-V	227.00
.4646	11.800 mm	1.393	**35.40 mm**	(3x)	45.93 mm	2.44 mm	12 mm	100 mm	V891844	115.00	V891844-V	131.00
.4646	11.800 mm	2.322	**59.00 mm**	(5x)	70.71 mm	2.44 mm	12 mm	125 mm	V101325	210.00	V101325-V	227.00
.4685	11.900 mm	1.405	**35.70 mm**	(3x)	46.32 mm	2.46 mm	12 mm	100 mm	V393491	115.00	V393491-V	131.00
.4685	11.900 mm	2.342	**59.50 mm**	(5x)	71.31 mm	2.46 mm	12 mm	125 mm	V470839	210.00	V470839-V	227.00
.4688 (15/32)	11.907 mm	1.405	**35.70 mm**	(3x)	46.34 mm	2.47 mm	12 mm	100 mm	V477349	115.00	V477349-V	131.00
.4688 (15/32)	11.907 mm	2.344	**59.55 mm**	(5x)	71.35 mm	2.47 mm	12 mm	125 mm	V910118	210.00	V910118-V	227.00
.4724	12.000 mm	1.417	**36.00 mm**	(3x)	46.70 mm	2.49 mm	14 mm	100 mm	V890909	115.00	V890909-V	133.50
.4724	12.000 mm	2.362	**60.00 mm**	(5x)	71.90 mm	2.49 mm	14 mm	125 mm	V660828	210.00	V660828-V	229.50
.4764	12.100 mm	1.429	**36.30 mm**	(3x)	47.09 mm	2.51 mm	14 mm	100 mm	V634940	151.50	V634940-V	170.00
.4764	12.100 mm	2.381	**60.50 mm**	(5x)	72.50 mm	2.51 mm	14 mm	125 mm	V932711	263.00	V932711-V	282.50
.4803	12.200 mm	1.440	**36.60 mm**	(3x)	47.48 mm	2.53 mm	14 mm	100 mm	V905748	151.50	V905748-V	170.00
.4803	12.200 mm	2.401	**61.00 mm**	(5x)	73.10 mm	2.53 mm	14 mm	125 mm	V781595	263.00	V781595-V	282.50
.4843	12.300 mm	1.452	**36.90 mm**	(3x)	47.87 mm	2.55 mm	14 mm	100 mm	V170687	151.50	V170687-V	170.00
.4843	12.300 mm	2.421	**61.50 mm**	(5x)	73.70 mm	2.55 mm	14 mm	125 mm	V699007	263.00	V699007-V	282.50
.4882 (31/64)	12.400 mm	1.464	**37.20 mm**	(3x)	48.26 mm	2.57 mm	14 mm	100 mm	V359843	151.50	V359843-V	170.00
.4882 (31/64)	12.400 mm	2.440	**62.00 mm**	(5x)	74.30 mm	2.57 mm	14 mm	125 mm	V692988	263.00	V692988-V	282.50
.4921	12.500 mm	1.476	**37.50 mm**	(3x)	48.65 mm	2.59 mm	14 mm	100 mm	V512726	151.50	V512726-V	170.00
.4921	12.500 mm	2.460	**62.50 mm**	(5x)	74.90 mm	2.59 mm	14 mm	125 mm	V684136	263.00	V684136-V	282.50
.4961	12.600 mm	1.488	**37.80 mm**	(3x)	49.04 mm	2.61 mm	14 mm	100 mm	V622722	165.20	V622722-V	183.50
.4961	12.600 mm	2.480	**63.00 mm**	(5x)	75.50 mm	2.61 mm	14 mm	125 mm	V951870	263.00	V951870-V	282.50
.5000 (1/2)	12.700 mm	1.499	**38.10 mm**	(3x)	49.43 mm	2.63 mm	14 mm	100 mm	V503316	165.20	V503316-V	183.50
.5000 (1/2)	12.700 mm	2.499	**63.50 mm**	(5x)	76.10 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.

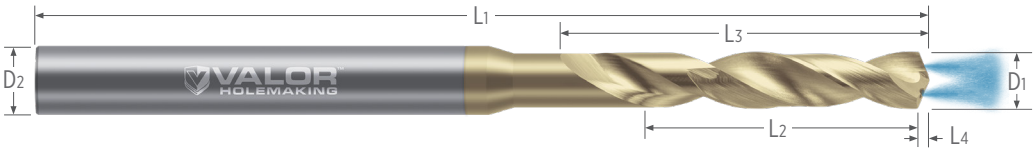
High Performance Drills

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	.312	**7.95 mm**	**(5x)**	9.51 mm	.33 mm	3 mm	63 mm	V995092	95.50	V995092-V	101.00
.0625 (1/16)	1.587 mm	.499	**12.70 mm**	**(8x)**	14.50 mm	.33 mm	3 mm	63 mm	V484828	162.50	V484828-V	168.00
.0630	1.600 mm	.314	**8.00 mm**	**(5x)**	9.58 mm	.33 mm	3 mm	63 mm	V501534	95.50	V501534-V	101.00
.0630	1.600 mm	.503	**12.80 mm**	**(8x)**	14.62 mm	.33 mm	3 mm	63 mm	V680349	162.50	V680349-V	168.00
.0669	1.700 mm	.334	**8.50 mm**	**(5x)**	10.18 mm	.35 mm	3 mm	63 mm	V605780	95.50	V605780-V	101.00
.0669	1.700 mm	.535	**13.60 mm**	**(8x)**	15.54 mm	.35 mm	3 mm	63 mm	V910907	162.50	V910907-V	168.00
.0708	1.800 mm	.354	**9.00 mm**	**(5x)**	10.78 mm	.37 mm	3 mm	63 mm	V322492	95.50	V322492-V	101.00
.0708	1.800 mm	.566	**14.40 mm**	**(8x)**	16.45 mm	.37 mm	3 mm	63 mm	V882014	162.50	V882014-V	168.00
.0748	1.900 mm	.374	**9.50 mm**	**(5x)**	11.38 mm	.39 mm	3 mm	63 mm	V531576	95.50	V531576-V	101.00
.0748	1.900 mm	.598	**15.20 mm**	**(8x)**	17.37 mm	.39 mm	3 mm	63 mm	V421746	162.50	V421746-V	168.00
.0781 (5/64)	1.984 mm	.389	**9.90 mm**	**(5x)**	11.88 mm	.41 mm	3 mm	63 mm	V658747	95.50	V658747-V	101.00
.0781 (5/64)	1.984 mm	.624	**15.85 mm**	**(8x)**	18.13 mm	.41 mm	3 mm	63 mm	V880813	162.50	V880813-V	168.00
.0787	2.000 mm	.393	**10.00 mm**	**(5x)**	11.98 mm	.41 mm	3 mm	63 mm	V420395	95.50	V420395-V	101.00
.0787	2.000 mm	.629	**16.00 mm**	**(8x)**	18.28 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	.413	**10.50 mm**	(5x)	12.58 mm	.43 mm	3 mm	63 mm	V260199	95.50	V260199-V	101.00
.0826	2.100 mm	.661	**16.80 mm**	(8x)	19.19 mm	.43 mm	3 mm	63 mm	V390543	162.50	V390543-V	168.00
.0866	2.200 mm	.433	**11.00 mm**	(5x)	13.18 mm	.46 mm	3 mm	63 mm	V507605	95.50	V507605-V	101.00
.0866	2.200 mm	.692	**17.60 mm**	(8x)	20.11 mm	.46 mm	3 mm	63 mm	V841569	162.50	V841569-V	168.00
.0905	2.300 mm	.452	**11.50 mm**	(5x)	13.78 mm	.48 mm	3 mm	63 mm	V303320	95.50	V303320-V	101.00
.0905	2.300 mm	.724	**18.40 mm**	(8x)	21.02 mm	.48 mm	3 mm	63 mm	V664000	162.50	V664000-V	168.00
.0937 (3/32)	2.381 mm	.468	**11.90 mm**	(5x)	14.26 mm	.49 mm	3 mm	63 mm	V626473	95.50	V626473-V	101.00
.0937 (3/32)	2.381 mm	.749	**19.05 mm**	(8x)	21.76 mm	.49 mm	3 mm	63 mm	V773519	162.50	V773519-V	168.00
.0944	2.400 mm	.472	**12.00 mm**	(5x)	14.38 mm	.50 mm	3 mm	63 mm	V199489	95.50	V199489-V	101.00
.0944	2.400 mm	.755	**19.20 mm**	(8x)	21.94 mm	.50 mm	3 mm	63 mm	V234473	162.50	V234473-V	168.00
.0984	2.500 mm	.492	**12.50 mm**	(5x)	14.98 mm	.52 mm	3 mm	63 mm	V302724	95.50	V302724-V	101.00
.0984	2.500 mm	.787	**20.00 mm**	(8x)	22.85 mm	.52 mm	3 mm	63 mm	V755519	162.50	V755519-V	168.00
.1023	2.600 mm	.511	**13.00 mm**	(5x)	15.58 mm	.54 mm	3 mm	63 mm	V520958	95.50	V520958-V	101.00
.1023	2.600 mm	.818	**20.80 mm**	(8x)	23.77 mm	.54 mm	3 mm	63 mm	V492168	162.50	V492168-V	168.00
.1062	2.700 mm	.531	**13.50 mm**	(5x)	16.17 mm	.56 mm	3 mm	63 mm	V527387	95.50	V527387-V	101.00
.1062	2.700 mm	.850	**21.60 mm**	(8x)	24.68 mm	.56 mm	3 mm	63 mm	V196896	162.50	V196896-V	168.00
.1093 (7/64)	2.778 mm	.547	**13.90 mm**	(5x)	16.64 mm	.58 mm	3 mm	63 mm	V278759	95.50	V278759-V	101.00
.1093 (7/64)	2.778 mm	.874	**22.20 mm**	(8x)	25.39 mm	.58 mm	3 mm	63 mm	V618198	162.50	V618198-V	168.00
.1102	2.800 mm	.551	**14.00 mm**	(5x)	16.77 mm	.58 mm	3 mm	63 mm	V730812	95.50	V730812-V	101.00
.1102	2.800 mm	.881	**22.40 mm**	(8x)	25.59 mm	.58 mm	3 mm	63 mm	V963101	162.50	V963101-V	168.00
.1141	2.900 mm	.570	**14.50 mm**	(5x)	17.37 mm	.60 mm	3 mm	63 mm	V882240	95.50	V882240-V	101.00
.1141	2.900 mm	.913	**23.20 mm**	(8x)	26.51 mm	.60 mm	3 mm	63 mm	V385580	162.50	V385580-V	168.00
.1181	3.000 mm	.590	**15.00 mm**	(5x)	17.97 mm	.62 mm	4 mm	63 mm	V187918	95.50	V187918-V	102.00
.1181	3.000 mm	.944	**24.00 mm**	(8x)	27.42 mm	.62 mm	4 mm	75 mm	V860963	162.50	V860963-V	169.00
.1220	3.100 mm	.610	**15.50 mm**	(5x)	18.57 mm	.64 mm	4 mm	63 mm	V443746	95.50	V443746-V	102.00
.1220	3.100 mm	.976	**24.80 mm**	(8x)	28.34 mm	.64 mm	4 mm	75 mm	V577751	162.50	V577751-V	169.00
.1250 (1/8)	3.175 mm	.625	**15.90 mm**	(5x)	19.02 mm	.66 mm	4 mm	63 mm	V877822	95.50	V877822-V	102.00
.1250 (1/8)	3.175 mm	.999	**25.40 mm**	(8x)	29.02 mm	.66 mm	4 mm	75 mm	V846347	162.50	V846347-V	169.00
.1260	3.200 mm	.629	**16.00 mm**	(5x)	19.17 mm	.66 mm	4 mm	63 mm	V527462	95.50	V527462-V	102.00
.1260	3.200 mm	1.007	**25.60 mm**	(8x)	29.25 mm	.66 mm	4 mm	75 mm	V478157	162.50	V478157-V	169.00
.1300	3.300 mm	.649	**16.50 mm**	(5x)	19.77 mm	.68 mm	4 mm	63 mm	V584441	95.50	V584441-V	102.00
.1300	3.300 mm	1.039	**26.40 mm**	(8x)	30.17 mm	.68 mm	4 mm	75 mm	V828022	162.50	V828022-V	169.00
.1338	3.400 mm	.669	**17.00 mm**	(5x)	20.37 mm	.70 mm	4 mm	63 mm	V837035	95.50	V837035-V	102.00
.1338	3.400 mm	1.070	**27.20 mm**	(8x)	31.08 mm	.70 mm	4 mm	75 mm	V915819	162.50	V915819-V	169.00
.1377	3.500 mm	.688	**17.50 mm**	(5x)	20.97 mm	.72 mm	4 mm	63 mm	V357695	95.50	V357695-V	102.00
.1377	3.500 mm	1.102	**28.00 mm**	(8x)	31.99 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	.702	**17.85 mm**	(5x)	21.39 mm	.74 mm	4 mm	63 mm	V767730	95.50	V767730-V	102.00
.1406 (9/64)	3.571 mm	1.124	**28.55 mm**	(8x)	32.64 mm	.74 mm	4 mm	75 mm	V333089	162.50	V333089-V	169.00
.1417	3.600 mm	.708	**18.00 mm**	(5x)	21.57 mm	.75 mm	4 mm	63 mm	V139840	95.50	V139840-V	102.00
.1417	3.600 mm	1.133	**28.80 mm**	(8x)	32.91 mm	.75 mm	4 mm	75 mm	V241917	162.50	V241917-V	169.00
.1456	3.700 mm	.728	**18.50 mm**	(5x)	22.17 mm	.77 mm	4 mm	63 mm	V441225	95.50	V441225-V	102.00
.1456	3.700 mm	1.165	**29.60 mm**	(8x)	33.82 mm	.77 mm	4 mm	75 mm	V869984	162.50	V869984-V	169.00
.1496	3.800 mm	.748	**19.00 mm**	(5x)	22.77 mm	.79 mm	4 mm	63 mm	V818024	95.50	V818024-V	102.00
.1496	3.800 mm	1.196	**30.40 mm**	(8x)	34.74 mm	.79 mm	4 mm	75 mm	V756236	162.50	V756236-V	169.00
.1535	3.900 mm	.767	**19.50 mm**	(5x)	23.37 mm	.81 mm	4 mm	63 mm	V429888	95.50	V429888-V	102.00
.1535	3.900 mm	1.228	**31.20 mm**	(8x)	35.65 mm	.81 mm	4 mm	75 mm	V832803	162.50	V832803-V	169.00
.1562 (5/32)	3.968 mm	.781	**19.85 mm**	(5x)	23.77 mm	.82 mm	4 mm	63 mm	V205668	95.50	V205668-V	102.00
.1562 (5/32)	3.968 mm	1.249	**31.75 mm**	(8x)	36.27 mm	.82 mm	4 mm	75 mm	V576052	162.50	V576052-V	169.00
.1574	4.000 mm	.787	**20.00 mm**	(5x)	23.96 mm	.83 mm	6 mm	75 mm	V131303	99.50	V131303-V	107.00
.1574	4.000 mm	1.259	**32.00 mm**	(8x)	36.56 mm	.83 mm	6 mm	100 mm	V305691	162.50	V305691-V	170.50
.1614	4.100 mm	.807	**20.50 mm**	(5x)	24.56 mm	.85 mm	6 mm	75 mm	V679258	99.50	V679258-V	107.00
.1614	4.100 mm	1.291	**32.80 mm**	(8x)	37.48 mm	.85 mm	6 mm	100 mm	V557129	162.50	V557129-V	170.50
.1653	4.200 mm	.826	**21.00 mm**	(5x)	25.16 mm	.87 mm	6 mm	75 mm	V803894	99.50	V803894-V	107.00
.1653	4.200 mm	1.322	**33.60 mm**	(8x)	38.39 mm	.87 mm	6 mm	100 mm	V752243	162.50	V752243-V	170.50
.1692	4.300 mm	.846	**21.50 mm**	(5x)	25.76 mm	.89 mm	6 mm	75 mm	V223762	99.50	V223762-V	107.00
.1692	4.300 mm	1.354	**34.40 mm**	(8x)	39.31 mm	.89 mm	6 mm	100 mm	V775572	162.50	V775572-V	170.50
.1718 (11/64)	4.365 mm	.860	**21.85 mm**	(5x)	26.15 mm	.90 mm	6 mm	75 mm	V639751	99.50	V639751-V	107.00
.1718 (11/64)	4.365 mm	1.374	**34.90 mm**	(8x)	39.90 mm	.90 mm	6 mm	100 mm	V849166	162.50	V849166-V	170.50
.1732	4.400 mm	.866	**22.00 mm**	(5x)	26.36 mm	.91 mm	6 mm	75 mm	V918663	99.50	V918663-V	107.00
.1732	4.400 mm	1.385	**35.20 mm**	(8x)	40.22 mm	.91 mm	6 mm	100 mm	V356654	162.50	V356654-V	170.50
.1771	4.500 mm	.885	**22.50 mm**	(5x)	26.96 mm	.93 mm	6 mm	75 mm	V383315	99.50	V383315-V	107.00
.1771	4.500 mm	1.417	**36.00 mm**	(8x)	41.14 mm	.93 mm	6 mm	100 mm	V703950	162.50	V703950-V	170.50
.1811	4.600 mm	.905	**23.00 mm**	(5x)	27.56 mm	.95 mm	6 mm	75 mm	V342441	99.50	V342441-V	107.00
.1811	4.600 mm	1.448	**36.80 mm**	(8x)	42.05 mm	.95 mm	6 mm	100 mm	V202174	162.50	V202174-V	170.50
.1850	4.700 mm	.925	**23.50 mm**	(5x)	28.16 mm	.97 mm	6 mm	75 mm	V689582	99.50	V689582-V	107.00
.1850	4.700 mm	1.480	**37.60 mm**	(8x)	42.96 mm	.97 mm	6 mm	100 mm	V928497	162.50	V928497-V	170.50
.1875 (3/16)	4.762 mm	.937	**23.80 mm**	(5x)	28.53 mm	.99 mm	6 mm	75 mm	V675548	99.50	V675548-V	107.00
.1875 (3/16)	4.762 mm	1.499	**38.10 mm**	(8x)	43.53 mm	.99 mm	6 mm	100 mm	V431500	162.50	V431500-V	170.50
.1890	4.800 mm	.944	**24.00 mm**	(5x)	28.76 mm	.99 mm	6 mm	75 mm	V926654	99.50	V926654-V	107.00
.1890	4.800 mm	1.511	**38.40 mm**	(8x)	43.88 mm	.99 mm	6 mm	100 mm	V253484	162.50	V253484-V	170.50
.1930	4.900 mm	.964	**24.50 mm**	(5x)	29.36 mm	1.01 mm	6 mm	75 mm	V417508	99.50	V417508-V	107.00
.1930	4.900 mm	1.543	**39.20 mm**	(8x)	44.79 mm	1.01 mm	6 mm	100 mm	V904772	162.50	V904772-V	170.50

* 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
.1968	5.000 mm	.984	**25.00 mm**	**(5x)**	29.96 mm	1.04 mm	6 mm	75 mm	V761883	99.50	V761883-V	107.00
.1968	5.000 mm	1.574	**40.00 mm**	**(8x)**	45.71 mm	1.04 mm	6 mm	100 mm	V858075	162.50	V858075-V	170.50
.2007	5.100 mm	1.003	**25.50 mm**	**(5x)**	30.56 mm	1.06 mm	6 mm	75 mm	V487502	99.50	V487502-V	107.00
.2007	5.100 mm	1.606	**40.80 mm**	**(8x)**	46.62 mm	1.06 mm	6 mm	100 mm	V663020	162.50	V663020-V	170.50
.2031 (13/64)	5.159 mm	1.015	**25.80 mm**	**(5x)**	30.91 mm	1.07 mm	6 mm	75 mm	V802986	99.50	V802986-V	107.00
.2031 (13/64)	5.159 mm	1.624	**41.25 mm**	**(8x)**	47.16 mm	1.07 mm	6 mm	100 mm	V386945	162.50	V386945-V	170.50
.2047	5.200 mm	1.023	**26.00 mm**	**(5x)**	31.16 mm	1.08 mm	6 mm	75 mm	V411179	99.50	V411179-V	107.00
.2047	5.200 mm	1.637	**41.60 mm**	**(8x)**	47.54 mm	1.08 mm	6 mm	100 mm	V855920	162.50	V855920-V	170.50
.2086	5.300 mm	1.043	**26.50 mm**	**(5x)**	31.76 mm	1.10 mm	6 mm	75 mm	V969066	99.50	V969066-V	107.00
.2086	5.300 mm	1.669	**42.40 mm**	**(8x)**	48.45 mm	1.10 mm	6 mm	100 mm	V555520	162.50	V555520-V	170.50
.2125	5.400 mm	1.062	**27.00 mm**	**(5x)**	32.35 mm	1.12 mm	6 mm	75 mm	V923077	99.50	V923077-V	107.00
.2125	5.400 mm	1.700	**43.20 mm**	**(8x)**	49.36 mm	1.12 mm	6 mm	100 mm	V412862	162.50	V412862-V	170.50
.2165	5.500 mm	1.082	**27.50 mm**	**(5x)**	32.95 mm	1.14 mm	6 mm	75 mm	V332947	99.50	V332947-V	107.00
.2165	5.500 mm	1.732	**44.00 mm**	**(8x)**	50.28 mm	1.14 mm	6 mm	100 mm	V692720	162.50	V692720-V	170.50
.2187 (7/32)	5.556 mm	1.094	**27.80 mm**	**(5x)**	33.29 mm	1.15 mm	6 mm	75 mm	V192488	99.50	V192488-V	107.00
.2187 (7/32)	5.556 mm	1.749	**44.45 mm**	**(8x)**	50.79 mm	1.15 mm	6 mm	100 mm	V421981	162.50	V421981-V	170.50
.2205	5.600 mm	1.102	**28.00 mm**	**(5x)**	33.55 mm	1.16 mm	6 mm	75 mm	V300624	99.50	V300624-V	107.00
.2205	5.600 mm	1.763	**44.80 mm**	**(8x)**	51.19 mm	1.16 mm	6 mm	100 mm	V625957	162.50	V625957-V	170.50
.2244	5.700 mm	1.122	**28.50 mm**	**(5x)**	34.15 mm	1.18 mm	6 mm	75 mm	V932148	99.50	V932148-V	107.00
.2244	5.700 mm	1.795	**45.60 mm**	**(8x)**	52.11 mm	1.18 mm	6 mm	100 mm	V662636	162.50	V662636-V	170.50
.2283	5.800 mm	1.141	**29.00 mm**	**(5x)**	34.75 mm	1.20 mm	6 mm	75 mm	V583286	99.50	V583286-V	107.00
.2283	5.800 mm	1.826	**46.40 mm**	**(8x)**	53.02 mm	1.20 mm	6 mm	100 mm	V664218	162.50	V664218-V	170.50
.2322	5.900 mm	1.161	**29.50 mm**	**(5x)**	35.35 mm	1.22 mm	6 mm	75 mm	V424468	99.50	V424468-V	107.00
.2322	5.900 mm	1.858	**47.20 mm**	**(8x)**	53.94 mm	1.22 mm	6 mm	100 mm	V406472	162.50	V406472-V	170.50
.2343 (15/64)	5.953 mm	1.171	**29.75 mm**	**(5x)**	35.67 mm	1.23 mm	6 mm	75 mm	V483232	99.50	V483232-V	107.00
.2343 (15/64)	5.953 mm	1.874	**47.60 mm**	**(8x)**	54.42 mm	1.23 mm	6 mm	100 mm	V857943	162.50	V857943-V	170.50
.2362	6.000 mm	1.181	**30.00 mm**	**(5x)**	35.95 mm	1.24 mm	8 mm	100 mm	V514442	99.50	V514442-V	109.50
.2362	6.000 mm	1.889	**48.00 mm**	**(8x)**	54.85 mm	1.24 mm	8 mm	125 mm	V965807	162.50	V965807-V	173.00
.2401	6.100 mm	1.200	**30.50 mm**	**(5x)**	36.55 mm	1.26 mm	8 mm	100 mm	V699389	128.50	V699389-V	138.50
.2401	6.100 mm	1.921	**48.80 mm**	**(8x)**	55.76 mm	1.26 mm	8 mm	125 mm	V512364	223.00	V512364-V	233.50
.2440	6.200 mm	1.220	**31.00 mm**	**(5x)**	37.15 mm	1.28 mm	8 mm	100 mm	V333318	128.50	V333318-V	138.50
.2440	6.200 mm	1.952	**49.60 mm**	**(8x)**	56.68 mm	1.28 mm	8 mm	125 mm	V246360	223.00	V246360-V	233.50
.2480	6.300 mm	1.240	**31.50 mm**	**(5x)**	37.75 mm	1.30 mm	8 mm	100 mm	V716403	128.50	V716403-V	138.50
.2480	6.300 mm	1.984	**50.40 mm**	**(8x)**	57.59 mm	1.30 mm	8 mm	125 mm	V171510	223.00	V171510-V	233.50
.2500 (1/4)	6.350 mm	1.249	**31.75 mm**	**(5x)**	38.05 mm	1.32 mm	8 mm	100 mm	V924120	128.50	V924120-V	138.50
.2500 (1/4)	6.350 mm	1.999	**50.80 mm**	**(8x)**	58.05 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	1.259	**32.00 mm**	(5x)	38.35 mm	1.33 mm	8 mm	100 mm	V952739	128.50	V952739-V	138.50
.2520	6.400 mm	2.015	**51.20 mm**	(8x)	58.51 mm	1.33 mm	8 mm	125 mm	V442929	223.00	V442929-V	233.50
.2559	6.500 mm	1.279	**32.50 mm**	(5x)	38.95 mm	1.35 mm	8 mm	100 mm	V252657	128.50	V252657-V	138.50
.2559	6.500 mm	2.047	**52.00 mm**	(8x)	59.42 mm	1.35 mm	8 mm	125 mm	V981850	223.00	V981850-V	233.50
.2598	6.600 mm	1.299	**33.00 mm**	(5x)	39.55 mm	1.37 mm	8 mm	100 mm	V522677	128.50	V522677-V	138.50
.2598	6.600 mm	2.078	**52.80 mm**	(8x)	60.34 mm	1.37 mm	8 mm	125 mm	V583091	223.00	V583091-V	233.50
.2638	6.700 mm	1.318	**33.50 mm**	(5x)	40.14 mm	1.39 mm	8 mm	100 mm	V144907	128.50	V144907-V	138.50
.2638	6.700 mm	2.110	**53.60 mm**	(8x)	61.25 mm	1.39 mm	8 mm	125 mm	V320537	223.00	V320537-V	233.50
.2656 (17/64)	6.746 mm	1.328	**33.75 mm**	(5x)	40.42 mm	1.40 mm	8 mm	100 mm	V822656	128.50	V822656-V	138.50
.2656 (17/64)	6.746 mm	2.124	**53.95 mm**	(8x)	61.67 mm	1.40 mm	8 mm	125 mm	V403247	223.00	V403247-V	233.50
.2677	6.800 mm	1.338	**34.00 mm**	(5x)	40.74 mm	1.41 mm	8 mm	100 mm	V390334	128.50	V390334-V	138.50
.2677	6.800 mm	2.141	**54.40 mm**	(8x)	62.16 mm	1.41 mm	8 mm	125 mm	V892039	223.00	V892039-V	233.50
.2717	6.900 mm	1.358	**34.50 mm**	(5x)	41.34 mm	1.43 mm	8 mm	100 mm	V359934	128.50	V359934-V	138.50
.2717	6.900 mm	2.173	**55.20 mm**	(8x)	63.08 mm	1.43 mm	8 mm	125 mm	V272766	223.00	V272766-V	233.50
.2756	7.000 mm	1.377	**35.00 mm**	(5x)	41.94 mm	1.45 mm	8 mm	100 mm	V849487	128.50	V849487-V	138.50
.2756	7.000 mm	2.204	**56.00 mm**	(8x)	63.99 mm	1.45 mm	8 mm	125 mm	V582978	223.00	V582978-V	233.50
.2795	7.100 mm	1.397	**35.50 mm**	(5x)	42.54 mm	1.47 mm	8 mm	100 mm	V608576	128.50	V608576-V	138.50
.2795	7.100 mm	2.236	**56.80 mm**	(8x)	64.91 mm	1.47 mm	8 mm	125 mm	V700117	223.00	V700117-V	233.50
.2812 (9/32)	7.142 mm	1.405	**35.70 mm**	(5x)	42.79 mm	1.48 mm	8 mm	100 mm	V808410	128.50	V808410-V	138.50
.2812 (9/32)	7.142 mm	2.249	**57.15 mm**	(8x)	65.29 mm	1.48 mm	8 mm	125 mm	V298615	223.00	V298615-V	233.50
.2834	7.200 mm	1.417	**36.00 mm**	(5x)	43.14 mm	1.49 mm	8 mm	100 mm	V476150	128.50	V476150-V	138.50
.2834	7.200 mm	2.267	**57.60 mm**	(8x)	65.82 mm	1.49 mm	8 mm	125 mm	V933182	223.00	V933182-V	233.50
.2874	7.300 mm	1.437	**36.50 mm**	(5x)	43.74 mm	1.51 mm	8 mm	100 mm	V207592	128.50	V207592-V	138.50
.2874	7.300 mm	2.299	**58.40 mm**	(8x)	66.73 mm	1.51 mm	8 mm	125 mm	V359441	223.00	V359441-V	233.50
.2913	7.400 mm	1.456	**37.00 mm**	(5x)	44.34 mm	1.53 mm	8 mm	100 mm	V902089	128.50	V902089-V	138.50
.2913	7.400 mm	2.330	**59.20 mm**	(8x)	67.65 mm	1.53 mm	8 mm	125 mm	V654235	223.00	V654235-V	233.50
.2952	7.500 mm	1.476	**37.50 mm**	(5x)	44.94 mm	1.55 mm	8 mm	100 mm	V137771	128.50	V137771-V	138.50
.2952	7.500 mm	2.362	**60.00 mm**	(8x)	68.56 mm	1.55 mm	8 mm	125 mm	V444829	223.00	V444829-V	233.50
.2969 (19/64)	7.541 mm	1.484	**37.70 mm**	(5x)	45.18 mm	1.56 mm	8 mm	100 mm	V645522	128.50	V645522-V	138.50
.2969 (19/64)	7.541 mm	2.375	**60.35 mm**	(8x)	68.94 mm	1.56 mm	8 mm	125 mm	V319299	223.00	V319299-V	233.50
.2992	7.600 mm	1.496	**38.00 mm**	(5x)	45.54 mm	1.57 mm	8 mm	100 mm	V871764	128.50	V871764-V	138.50
.2992	7.600 mm	2.393	**60.80 mm**	(8x)	69.48 mm	1.57 mm	8 mm	125 mm	V937150	223.00	V937150-V	233.50
.3031	7.700 mm	1.515	**38.50 mm**	(5x)	46.14 mm	1.59 mm	8 mm	100 mm	V272800	128.50	V272800-V	138.50
.3031	7.700 mm	2.425	**61.60 mm**	(8x)	70.39 mm	1.59 mm	8 mm	125 mm	V733422	223.00	V733422-V	233.50
.3071	7.800 mm	1.535	**39.00 mm**	(5x)	46.74 mm	1.62 mm	8 mm	100 mm	V444378	128.50	V444378-V	138.50
.3071	7.800 mm	2.456	**62.40 mm**	(8x)	71.31 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

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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	1.555	**39.50 mm**	**(5x)**	47.34 mm	1.64 mm	8 mm	100 mm	V838506	128.50	V838506-V	138.50
.3110	7.900 mm	2.488	**63.20 mm**	**(8x)**	72.22 mm	1.64 mm	8 mm	125 mm	V118204	223.00	V118204-V	233.50
.3125 (5/16)	7.937 mm	1.562	**39.70 mm**	**(5x)**	47.56 mm	1.64 mm	8 mm	100 mm	V534118	128.50	V534118-V	138.50
.3125 (5/16)	7.937 mm	2.499	**63.50 mm**	**(8x)**	72.56 mm	1.64 mm	8 mm	125 mm	V181162	223.00	V181162-V	233.50
.3150	8.000 mm	1.574	**40.00 mm**	**(5x)**	47.93 mm	1.66 mm	10 mm	100 mm	V631086	128.50	V631086-V	140.00
.3150	8.000 mm	2.519	**64.00 mm**	**(8x)**	73.13 mm	1.66 mm	10 mm	125 mm	V372448	223.00	V372448-V	235.50
.3189	8.100 mm	1.594	**40.50 mm**	**(5x)**	48.53 mm	1.68 mm	10 mm	100 mm	V480410	146.50	V480410-V	158.00
.3189	8.100 mm	2.551	**64.80 mm**	**(8x)**	74.05 mm	1.68 mm	10 mm	125 mm	V373765	244.50	V373765-V	257.00
.3228	8.200 mm	1.614	**41.00 mm**	**(5x)**	49.13 mm	1.70 mm	10 mm	100 mm	V668382	146.50	V668382-V	158.00
.3228	8.200 mm	2.582	**65.60 mm**	**(8x)**	74.96 mm	1.70 mm	10 mm	125 mm	V581134	244.50	V581134-V	257.00
.3268	8.300 mm	1.633	**41.50 mm**	**(5x)**	49.73 mm	1.72 mm	10 mm	100 mm	V386606	146.50	V386606-V	158.00
.3268	8.300 mm	2.614	**66.40 mm**	**(8x)**	75.88 mm	1.72 mm	10 mm	125 mm	V496970	244.50	V496970-V	257.00
.3281 (21/64)	8.333 mm	1.639	**41.65 mm**	**(5x)**	49.93 mm	1.73 mm	10 mm	100 mm	V904466	146.50	V904466-V	158.00
.3281 (21/64)	8.333 mm	2.624	**66.65 mm**	**(8x)**	76.18 mm	1.73 mm	10 mm	125 mm	V185340	244.50	V185340-V	257.00
.3307	8.400 mm	1.653	**42.00 mm**	**(5x)**	50.33 mm	1.74 mm	10 mm	100 mm	V336999	146.50	V336999-V	158.00
.3307	8.400 mm	2.645	**67.20 mm**	**(8x)**	76.79 mm	1.74 mm	10 mm	125 mm	V555396	244.50	V555396-V	257.00
.3346	8.500 mm	1.673	**42.50 mm**	**(5x)**	50.93 mm	1.76 mm	10 mm	100 mm	V944598	146.50	V944598-V	158.00
.3346	8.500 mm	2.677	**68.00 mm**	**(8x)**	77.71 mm	1.76 mm	10 mm	125 mm	V102862	244.50	V102862-V	257.00
.3386	8.600 mm	1.692	**43.00 mm**	**(5x)**	51.53 mm	1.78 mm	10 mm	100 mm	V129890	146.50	V129890-V	158.00
.3386	8.600 mm	2.708	**68.80 mm**	**(8x)**	78.62 mm	1.78 mm	10 mm	125 mm	V259256	244.50	V259256-V	257.00
.3425	8.700 mm	1.712	**43.50 mm**	**(5x)**	52.13 mm	1.80 mm	10 mm	100 mm	V364436	146.50	V364436-V	158.00
.3425	8.700 mm	2.740	**69.60 mm**	**(8x)**	79.53 mm	1.80 mm	10 mm	125 mm	V578927	244.50	V578927-V	257.00
.3438 (11/32)	8.732 mm	1.718	**43.65 mm**	**(5x)**	52.32 mm	1.81 mm	10 mm	100 mm	V960893	146.50	V960893-V	158.00
.3438 (11/32)	8.732 mm	2.749	**69.85 mm**	**(8x)**	79.83 mm	1.81 mm	10 mm	125 mm	V828826	244.50	V828826-V	257.00
.3465	8.800 mm	1.732	**44.00 mm**	**(5x)**	52.73 mm	1.82 mm	10 mm	100 mm	V295589	146.50	V295589-V	158.00
.3465	8.800 mm	2.771	**70.40 mm**	**(8x)**	80.45 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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High Performance Drills

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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	1.751	**44.50 mm**	(5x)	53.33 mm	1.84 mm	10 mm	100 mm	V837355	146.50	V837355-V	158.00
.3504	8.900 mm	2.803	**71.20 mm**	(8x)	81.36 mm	1.84 mm	10 mm	150 mm	V650588	244.50	V650588-V	258.00
.3543	9.000 mm	1.771	**45.00 mm**	(5x)	53.93 mm	1.86 mm	10 mm	100 mm	V883001	146.50	V883001-V	158.00
.3543	9.000 mm	2.834	**72.00 mm**	(8x)	82.28 mm	1.86 mm	10 mm	150 mm	V158250	244.50	V158250-V	258.00
.3583	9.100 mm	1.791	**45.50 mm**	(5x)	54.53 mm	1.88 mm	10 mm	100 mm	V819645	146.50	V819645-V	158.00
.3583	9.100 mm	2.866	**72.80 mm**	(8x)	83.19 mm	1.88 mm	10 mm	150 mm	V132901	244.50	V132901-V	258.00
.3594 (23/64)	9.128 mm	1.797	**45.65 mm**	(5x)	54.69 mm	1.89 mm	10 mm	100 mm	V655775	146.50	V655775-V	158.00
.3594 (23/64)	9.128 mm	2.874	**73.00 mm**	(8x)	83.45 mm	1.89 mm	10 mm	150 mm	V272571	244.50	V272571-V	258.00
.3622	9.200 mm	1.811	**46.00 mm**	(5x)	55.13 mm	1.91 mm	10 mm	100 mm	V687657	146.50	V687657-V	158.00
.3622	9.200 mm	2.897	**73.60 mm**	(8x)	84.11 mm	1.91 mm	10 mm	150 mm	V871378	244.50	V871378-V	258.00
.3661	9.300 mm	1.830	**46.50 mm**	(5x)	55.72 mm	1.93 mm	10 mm	100 mm	V787709	146.50	V787709-V	158.00
.3661	9.300 mm	2.929	**74.40 mm**	(8x)	85.02 mm	1.93 mm	10 mm	150 mm	V503354	244.50	V503354-V	258.00
.3701	9.400 mm	1.850	**47.00 mm**	(5x)	56.32 mm	1.95 mm	10 mm	100 mm	V307018	146.50	V307018-V	158.00
.3701	9.400 mm	2.960	**75.20 mm**	(8x)	85.93 mm	1.95 mm	10 mm	150 mm	V207468	244.50	V207468-V	258.00
.3740	9.500 mm	1.870	**47.50 mm**	(5x)	56.92 mm	1.97 mm	10 mm	100 mm	V718117	146.50	V718117-V	158.00
.3740	9.500 mm	2.992	**76.00 mm**	(8x)	86.85 mm	1.97 mm	10 mm	150 mm	V732216	244.50	V732216-V	258.00
.3750 (3/8)	9.525 mm	1.875	**47.65 mm**	(5x)	57.07 mm	1.97 mm	10 mm	100 mm	V210563	146.50	V210563-V	158.00
.3750 (3/8)	9.525 mm	2.999	**76.20 mm**	(8x)	87.08 mm	1.97 mm	10 mm	150 mm	V224674	244.50	V224674-V	258.00
.3780	9.600 mm	1.889	**48.00 mm**	(5x)	57.52 mm	1.99 mm	10 mm	100 mm	V417983	146.50	V417983-V	158.00
.3780	9.600 mm	3.023	**76.80 mm**	(8x)	87.76 mm	1.99 mm	10 mm	150 mm	V845546	244.50	V845546-V	258.00
.3819	9.700 mm	1.909	**48.50 mm**	(5x)	58.12 mm	2.01 mm	10 mm	100 mm	V211508	146.50	V211508-V	158.00
.3819	9.700 mm	3.055	**77.60 mm**	(8x)	88.68 mm	2.01 mm	10 mm	150 mm	V283637	244.50	V283637-V	258.00
.3858	9.800 mm	1.929	**49.00 mm**	(5x)	58.72 mm	2.03 mm	10 mm	100 mm	V183783	146.50	V183783-V	158.00
.3858	9.800 mm	3.086	**78.40 mm**	(8x)	89.59 mm	2.03 mm	10 mm	150 mm	V456526	244.50	V456526-V	258.00
.3898	9.900 mm	1.948	**49.50 mm**	(5x)	59.32 mm	2.05 mm	10 mm	100 mm	V828417	146.50	V828417-V	158.00
.3898	9.900 mm	3.118	**79.20 mm**	(8x)	90.51 mm	2.05 mm	10 mm	150 mm	V591316	244.50	V591316-V	258.00
.3906 (25/64)	9.921 mm	1.952	**49.60 mm**	(5x)	59.45 mm	2.05 mm	10 mm	100 mm	V206750	146.50	V206750-V	158.00
.3906 (25/64)	9.921 mm	3.124	**79.35 mm**	(8x)	90.70 mm	2.05 mm	10 mm	150 mm	V592921	244.50	V592921-V	258.00
.3937	10.000 mm	1.968	**50.00 mm**	(5x)	59.92 mm	2.07 mm	12 mm	125 mm	V510346	146.50	V510346-V	163.50
.3937	10.000 mm	3.149	**80.00 mm**	(8x)	91.42 mm	2.07 mm	12 mm	150 mm	V906154	244.50	V906154-V	263.00
.3976	10.100 mm	1.988	**50.50 mm**	(5x)	60.52 mm	2.09 mm	12 mm	125 mm	V393209	206.00	V393209-V	223.00
.3976	10.100 mm	3.181	**80.80 mm**	(8x)	92.33 mm	2.09 mm	12 mm	150 mm	V912984	323.50	V912984-V	342.00
.4016	10.200 mm	2.007	**51.00 mm**	(5x)	61.12 mm	2.11 mm	12 mm	125 mm	V241050	206.00	V241050-V	223.00
.4016	10.200 mm	3.212	**81.60 mm**	(8x)	93.25 mm	2.11 mm	12 mm	150 mm	V781707	323.50	V781707-V	342.00
.4055	10.300 mm	2.027	**51.50 mm**	(5x)	61.72 mm	2.13 mm	12 mm	125 mm	V693701	206.00	V693701-V	223.00
.4055	10.300 mm	3.244	**82.40 mm**	(8x)	94.16 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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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	2.031	**51.60 mm**	(5x)	61.82 mm	2.14 mm	12 mm	125 mm	V426663	206.00	V426663-V	223.00
.4062 (13/32)	10.317 mm	3.249	**82.55 mm**	(8x)	94.32 mm	2.14 mm	12 mm	150 mm	V165261	323.50	V165261-V	342.00
.4094	10.400 mm	2.047	**52.00 mm**	(5x)	62.32 mm	2.15 mm	12 mm	125 mm	V805959	206.00	V805959-V	223.00
.4094	10.400 mm	3.275	**83.20 mm**	(8x)	95.08 mm	2.15 mm	12 mm	150 mm	V585515	323.50	V585515-V	342.00
.4134	10.500 mm	2.066	**52.50 mm**	(5x)	62.92 mm	2.17 mm	12 mm	125 mm	V891328	206.00	V891328-V	223.00
.4134	10.500 mm	3.307	**84.00 mm**	(8x)	95.99 mm	2.17 mm	12 mm	150 mm	V656520	323.50	V656520-V	342.00
.4173	10.600 mm	2.086	**53.00 mm**	(5x)	63.52 mm	2.20 mm	12 mm	125 mm	V811500	206.00	V811500-V	223.00
.4173	10.600 mm	3.338	**84.80 mm**	(8x)	96.91 mm	2.20 mm	12 mm	150 mm	V517271	323.50	V517271-V	342.00
.4213	10.700 mm	2.106	**53.50 mm**	(5x)	64.11 mm	2.22 mm	12 mm	125 mm	V980072	206.00	V980072-V	223.00
.4213	10.700 mm	3.370	**85.60 mm**	(8x)	97.82 mm	2.22 mm	12 mm	150 mm	V352223	323.50	V352223-V	342.00
.4219 (27/64)	10.716 mm	2.110	**53.60 mm**	(5x)	64.21 mm	2.22 mm	12 mm	125 mm	V422407	206.00	V422407-V	223.00
.4219 (27/64)	10.716 mm	3.375	**85.75 mm**	(8x)	97.97 mm	2.22 mm	12 mm	150 mm	V628625	323.50	V628625-V	342.00
.4252	10.800 mm	2.125	**54.00 mm**	(5x)	64.71 mm	2.24 mm	12 mm	125 mm	V433000	206.00	V433000-V	223.00
.4252	10.800 mm	3.401	**86.40 mm**	(8x)	98.73 mm	2.24 mm	12 mm	150 mm	V876124	323.50	V876124-V	342.00
.4291	10.900 mm	2.145	**54.50 mm**	(5x)	65.31 mm	2.26 mm	12 mm	125 mm	V507576	206.00	V507576-V	223.00
.4291	10.900 mm	3.433	**87.20 mm**	(8x)	99.65 mm	2.26 mm	12 mm	175 mm	V959173	323.50	V959173-V	343.50
.4331	11.000 mm	2.165	**55.00 mm**	(5x)	65.91 mm	2.28 mm	12 mm	125 mm	V216634	206.00	V216634-V	223.00
.4331	11.000 mm	3.464	**88.00 mm**	(8x)	100.56 mm	2.28 mm	12 mm	175 mm	V705619	323.50	V705619-V	343.50
.4370	11.100 mm	2.185	**55.50 mm**	(5x)	66.51 mm	2.30 mm	12 mm	125 mm	V838445	206.00	V838445-V	223.00
.4370	11.100 mm	3.496	**88.80 mm**	(8x)	101.48 mm	2.30 mm	12 mm	175 mm	V554353	323.50	V554353-V	343.50
.4375 (7/16)	11.112 mm	2.187	**55.55 mm**	(5x)	66.58 mm	2.30 mm	12 mm	125 mm	V258691	206.00	V258691-V	223.00
.4375 (7/16)	11.112 mm	3.499	**88.90 mm**	(8x)	101.59 mm	2.30 mm	12 mm	175 mm	V865610	323.50	V865610-V	343.50
.4409	11.200 mm	2.204	**56.00 mm**	(5x)	67.11 mm	2.32 mm	12 mm	125 mm	V837182	206.00	V837182-V	223.00
.4409	11.200 mm	3.527	**89.60 mm**	(8x)	102.39 mm	2.32 mm	12 mm	175 mm	V638291	323.50	V638291-V	343.50
.4449	11.300 mm	2.224	**56.50 mm**	(5x)	67.71 mm	2.34 mm	12 mm	125 mm	V104347	206.00	V104347-V	223.00
.4449	11.300 mm	3.559	**90.40 mm**	(8x)	103.30 mm	2.34 mm	12 mm	175 mm	V923125	323.50	V923125-V	343.50
.4488	11.400 mm	2.244	**57.00 mm**	(5x)	68.31 mm	2.36 mm	12 mm	125 mm	V145663	206.00	V145663-V	223.00
.4488	11.400 mm	3.590	**91.20 mm**	(8x)	104.22 mm	2.36 mm	12 mm	175 mm	V218282	323.50	V218282-V	343.50
.4527	11.500 mm	2.263	**57.50 mm**	(5x)	68.91 mm	2.38 mm	12 mm	125 mm	V845377	206.00	V845377-V	223.00
.4527	11.500 mm	3.622	**92.00 mm**	(8x)	105.13 mm	2.38 mm	12 mm	175 mm	V679783	323.50	V679783-V	343.50
.4531 (29/64)	11.508 mm	2.265	**57.55 mm**	(5x)	68.96 mm	2.38 mm	12 mm	125 mm	V520815	206.00	V520815-V	223.00
.4531 (29/64)	11.508 mm	3.624	**92.05 mm**	(8x)	105.21 mm	2.38 mm	12 mm	175 mm	V960077	323.50	V960077-V	343.50
.4567	11.600 mm	2.283	**58.00 mm**	(5x)	69.51 mm	2.40 mm	12 mm	125 mm	V214907	206.00	V214907-V	223.00
.4567	11.600 mm	3.653	**92.80 mm**	(8x)	106.05 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.)

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
.4606	11.700 mm	2.303	**58.50 mm**	(5x)	70.11 mm	2.42 mm	12 mm	125 mm	V858509	206.00	V858509-V	223.00
.4606	11.700 mm	3.685	**93.60 mm**	(8x)	106.96 mm	2.42 mm	12 mm	175 mm	V313087	323.50	V313087-V	343.50
.4646	11.800 mm	2.322	**59.00 mm**	(5x)	70.71 mm	2.44 mm	12 mm	125 mm	V216870	206.00	V216870-V	223.00
.4646	11.800 mm	3.716	**94.40 mm**	(8x)	107.88 mm	2.44 mm	12 mm	175 mm	V902922	323.50	V902922-V	343.50
.4685	11.900 mm	2.342	**59.50 mm**	(5x)	71.31 mm	2.46 mm	12 mm	125 mm	V722943	206.00	V722943-V	223.00
.4685	11.900 mm	3.748	**95.20 mm**	(8x)	108.79 mm	2.46 mm	12 mm	175 mm	V889227	323.50	V889227-V	343.50
.4688 (15/32)	11.907 mm	2.344	**59.55 mm**	(5x)	71.35 mm	2.47 mm	12 mm	125 mm	V715708	206.00	V715708-V	223.00
.4688 (15/32)	11.907 mm	3.749	**95.25 mm**	(8x)	108.85 mm	2.47 mm	12 mm	175 mm	V209677	323.50	V209677-V	343.50
.4724	12.000 mm	2.362	**60.00 mm**	(5x)	71.90 mm	2.49 mm	14 mm	125 mm	V312296	206.00	V312296-V	225.50
.4724	12.000 mm	3.779	**96.00 mm**	(8x)	109.70 mm	2.49 mm	14 mm	175 mm	V339609	323.50	V339609-V	346.50
.4764	12.100 mm	2.381	**60.50 mm**	(5x)	72.50 mm	2.51 mm	14 mm	125 mm	V904889	284.00	V904889-V	303.50
.4764	12.100 mm	3.811	**96.80 mm**	(8x)	110.62 mm	2.51 mm	14 mm	175 mm	V264702	437.50	V264702-V	460.50
.4803	12.200 mm	2.401	**61.00 mm**	(5x)	73.10 mm	2.53 mm	14 mm	125 mm	V727024	284.00	V727024-V	303.50
.4803	12.200 mm	3.842	**97.60 mm**	(8x)	111.53 mm	2.53 mm	14 mm	175 mm	V954879	437.50	V954879-V	460.50
.4843	12.300 mm	2.421	**61.50 mm**	(5x)	73.70 mm	2.55 mm	14 mm	125 mm	V804318	284.00	V804318-V	303.50
.4843	12.300 mm	3.874	**98.40 mm**	(8x)	112.45 mm	2.55 mm	14 mm	175 mm	V559229	437.50	V559229-V	460.50
.4882 (31/64)	12.400 mm	2.440	**62.00 mm**	(5x)	74.30 mm	2.57 mm	14 mm	125 mm	V680043	284.00	V680043-V	303.50
.4882 (31/64)	12.400 mm	3.905	**99.20 mm**	(8x)	113.36 mm	2.57 mm	14 mm	175 mm	V597636	437.50	V597636-V	460.50
.4921	12.500 mm	2.460	**62.50 mm**	(5x)	74.90 mm	2.59 mm	14 mm	125 mm	V396773	284.00	V396773-V	303.50
.4921	12.500 mm	3.937	**100.00 mm**	(8x)	114.28 mm	2.59 mm	14 mm	175 mm	V576237	437.50	V576237-V	460.50
.4961	12.600 mm	2.480	**63.00 mm**	(5x)	75.50 mm	2.61 mm	14 mm	125 mm	V560508	284.00	V560508-V	303.50
.4961	12.600 mm	3.968	**100.80 mm**	(8x)	115.19 mm	2.61 mm	14 mm	175 mm	V511270	437.50	V511270-V	460.50
.5000 (1/2)	12.700 mm	2.499	**63.50 mm**	(5x)	76.10 mm	2.63 mm	14 mm	125 mm	V346191	284.00	V346191-V	303.50
.5000 (1/2)	12.700 mm	3.999	**101.60 mm**	(8x)	116.10 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**.

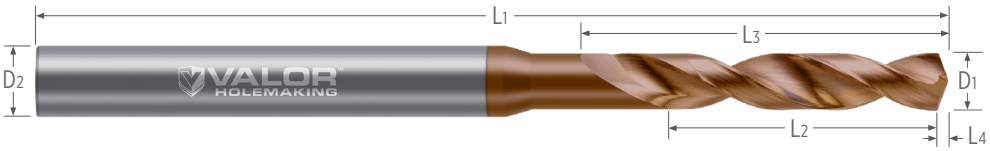
High Performance Drills

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	.187	**4.75 mm**	**(3x)**	6.13 mm	.29 mm	3 mm	63 mm	V973517-X	66.50
.0625 (1/16)	1.587 mm	.312	**7.95 mm**	**(5x)**	9.46 mm	.29 mm	3 mm	63 mm	V296154-X	85.50
.0625 (1/16)	1.587 mm	.499	**12.70 mm**	**(8x)**	14.46 mm	.29 mm	3 mm	63 mm	V623340-X	114.50
.0630	1.600 mm	.188	**4.80 mm**	**(3x)**	6.18 mm	.29 mm	3 mm	63 mm	V957351-X	66.50
.0630	1.600 mm	.314	**8.00 mm**	**(5x)**	9.54 mm	.29 mm	3 mm	63 mm	V462279-X	85.50
.0630	1.600 mm	.503	**12.80 mm**	**(8x)**	14.58 mm	.29 mm	3 mm	63 mm	V305247-X	114.50
.0669	1.700 mm	.200	**5.10 mm**	**(3x)**	6.57 mm	.31 mm	3 mm	63 mm	V868330-X	66.50
.0669	1.700 mm	.334	**8.50 mm**	**(5x)**	10.14 mm	.31 mm	3 mm	63 mm	V118791-X	85.50
.0669	1.700 mm	.535	**13.60 mm**	**(8x)**	15.49 mm	.31 mm	3 mm	63 mm	V896049-X	114.50
.0708	1.800 mm	.212	**5.40 mm**	**(3x)**	6.95 mm	.33 mm	3 mm	63 mm	V779567-X	66.50
.0708	1.800 mm	.354	**9.00 mm**	**(5x)**	10.73 mm	.33 mm	3 mm	63 mm	V794019-X	85.50
.0708	1.800 mm	.566	**14.40 mm**	**(8x)**	16.40 mm	.33 mm	3 mm	63 mm	V178926-X	114.50
.0748	1.900 mm	.224	**5.70 mm**	**(3x)**	7.34 mm	.35 mm	3 mm	63 mm	V185449-X	66.50
.0748	1.900 mm	.374	**9.50 mm**	**(5x)**	11.33 mm	.35 mm	3 mm	63 mm	V249203-X	85.50
.0748	1.900 mm	.598	**15.20 mm**	**(8x)**	17.32 mm	.35 mm	3 mm	63 mm	V483409-X	114.50

* For h6 and h8 tolerances, see page 8.

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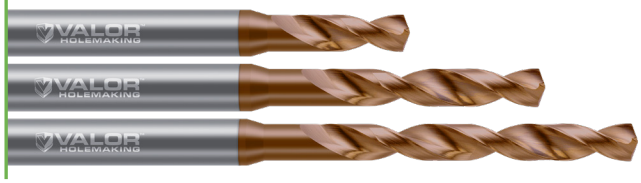
Stocked in 3x, 5x, and 8x hole depths



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		
.0781 (5/64)	1.984 mm	.234	**5.95 mm**	**(3x)**	7.67 mm	.36 mm	3 mm	63 mm	V467156-X	66.50
.0781 (5/64)	1.984 mm	.389	**9.90 mm**	**(5x)**	11.83 mm	.36 mm	3 mm	63 mm	V224870-X	85.50
.0781 (5/64)	1.984 mm	.624	**15.85 mm**	**(8x)**	18.08 mm	.36 mm	3 mm	63 mm	V911271-X	114.50
.0787	2.000 mm	.236	**6.00 mm**	**(3x)**	7.73 mm	.36 mm	3 mm	63 mm	V826750-X	66.50
.0787	2.000 mm	.393	**10.00 mm**	**(5x)**	11.93 mm	.36 mm	3 mm	63 mm	V979538-X	92.00
.0787	2.000 mm	.629	**16.00 mm**	**(8x)**	18.23 mm	.36 mm	3 mm	63 mm	V918445-X	119.50
.0826	2.100 mm	.248	**6.30 mm**	**(3x)**	8.11 mm	.38 mm	3 mm	63 mm	V110651-X	66.50
.0826	2.100 mm	.413	**10.50 mm**	**(5x)**	12.52 mm	.38 mm	3 mm	63 mm	V392180-X	92.00
.0826	2.100 mm	.661	**16.80 mm**	**(8x)**	19.14 mm	.38 mm	3 mm	63 mm	V704770-X	119.50
.0866	2.200 mm	.259	**6.60 mm**	**(3x)**	8.50 mm	.40 mm	3 mm	63 mm	V569646-X	66.50
.0866	2.200 mm	.433	**11.00 mm**	**(5x)**	13.12 mm	.40 mm	3 mm	63 mm	V659262-X	92.00
.0866	2.200 mm	.692	**17.60 mm**	**(8x)**	20.05 mm	.40 mm	3 mm	63 mm	V259528-X	119.50
.0905	2.300 mm	.271	**6.90 mm**	**(3x)**	8.89 mm	.42 mm	3 mm	63 mm	V519827-X	66.50
.0905	2.300 mm	.452	**11.50 mm**	**(5x)**	13.72 mm	.42 mm	3 mm	63 mm	V941185-X	92.00
.0905	2.300 mm	.724	**18.40 mm**	**(8x)**	20.96 mm	.42 mm	3 mm	63 mm	V962527-X	119.50
.0937 (3/32)	2.381 mm	.281	**7.15 mm**	**(3x)**	9.20 mm	.43 mm	3 mm	63 mm	V964923-X	66.50
.0937 (3/32)	2.381 mm	.468	**11.90 mm**	**(5x)**	14.20 mm	.43 mm	3 mm	63 mm	V170896-X	92.00
.0937 (3/32)	2.381 mm	.749	**19.05 mm**	**(8x)**	21.70 mm	.43 mm	3 mm	63 mm	V630268-X	119.50
.0944	2.400 mm	.283	**7.20 mm**	**(3x)**	9.27 mm	.44 mm	3 mm	63 mm	V713265-X	66.50
.0944	2.400 mm	.472	**12.00 mm**	**(5x)**	14.31 mm	.44 mm	3 mm	63 mm	V766011-X	92.00
.0944	2.400 mm	.755	**19.20 mm**	**(8x)**	21.87 mm	.44 mm	3 mm	63 mm	V931255-X	119.50
.0984	2.500 mm	.295	**7.50 mm**	**(3x)**	9.66 mm	.45 mm	3 mm	63 mm	V441162-X	68.50
.0984	2.500 mm	.492	**12.50 mm**	**(5x)**	14.91 mm	.45 mm	3 mm	63 mm	V665871-X	94.50
.0984	2.500 mm	.787	**20.00 mm**	**(8x)**	22.79 mm	.45 mm	3 mm	63 mm	V753719-X	127.00
.1023	2.600 mm	.307	**7.80 mm**	**(3x)**	10.05 mm	.47 mm	3 mm	63 mm	V776161-X	68.50
.1023	2.600 mm	.511	**13.00 mm**	**(5x)**	15.51 mm	.47 mm	3 mm	63 mm	V935510-X	94.50
.1023	2.600 mm	.818	**20.80 mm**	**(8x)**	23.70 mm	.47 mm	3 mm	63 mm	V864115-X	127.00
.1062	2.700 mm	.318	**8.10 mm**	**(3x)**	10.43 mm	.49 mm	3 mm	63 mm	V375655-X	68.50
.1062	2.700 mm	.531	**13.50 mm**	**(5x)**	16.10 mm	.49 mm	3 mm	63 mm	V120072-X	94.50
.1062	2.700 mm	.850	**21.60 mm**	**(8x)**	24.61 mm	.49 mm	3 mm	63 mm	V111219-X	127.00
.1093 (7/64)	2.778 mm	.328	**8.35 mm**	**(3x)**	10.73 mm	.51 mm	3 mm	63 mm	V959991-X	68.50
.1093 (7/64)	2.778 mm	.547	**13.90 mm**	**(5x)**	16.57 mm	.51 mm	3 mm	63 mm	V610313-X	94.50
.1093 (7/64)	2.778 mm	.874	**22.20 mm**	**(8x)**	25.32 mm	.51 mm	3 mm	63 mm	V254288-X	127.00
.1102	2.800 mm	.330	**8.40 mm**	**(3x)**	10.82 mm	.51 mm	3 mm	63 mm	V113654-X	68.50
.1102	2.800 mm	.551	**14.00 mm**	**(5x)**	16.70 mm	.51 mm	3 mm	63 mm	V555135-X	94.50
.1102	2.800 mm	.881	**22.40 mm**	**(8x)**	25.52 mm	.51 mm	3 mm	63 mm	V587228-X	127.00

* 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		
.1141	2.900 mm	.342	**8.70 mm**	**(3x)**	11.21 mm	.53 mm	3 mm	63 mm	V934711-X	68.50
.1141	2.900 mm	.570	**14.50 mm**	**(5x)**	17.30 mm	.53 mm	3 mm	63 mm	V425270-X	94.50
.1141	2.900 mm	.913	**23.20 mm**	**(8x)**	26.43 mm	.53 mm	3 mm	63 mm	V466163-X	127.00
.1181	3.000 mm	.354	**9.00 mm**	**(3x)**	11.59 mm	.55 mm	4 mm	63 mm	V448334-X	68.50
.1181	3.000 mm	.590	**15.00 mm**	**(5x)**	17.89 mm	.55 mm	4 mm	63 mm	V728184-X	94.50
.1181	3.000 mm	.944	**24.00 mm**	**(8x)**	27.34 mm	.55 mm	4 mm	75 mm	V816162-X	127.00
.1220	3.100 mm	.366	**9.30 mm**	**(3x)**	11.98 mm	.56 mm	4 mm	63 mm	V980525-X	58.50
.1220	3.100 mm	.610	**15.50 mm**	**(5x)**	18.49 mm	.56 mm	4 mm	63 mm	V262531-X	75.50
.1220	3.100 mm	.976	**24.80 mm**	**(8x)**	28.25 mm	.56 mm	4 mm	75 mm	V175931-X	173.00
.1250 (1/8)	3.175 mm	.374	**9.50 mm**	**(3x)**	12.27 mm	.58 mm	4 mm	63 mm	V757262-X	58.50
.1250 (1/8)	3.175 mm	.625	**15.90 mm**	**(5x)**	18.94 mm	.58 mm	4 mm	63 mm	V407402-X	75.50
.1250 (1/8)	3.175 mm	.999	**25.40 mm**	**(8x)**	28.94 mm	.58 mm	4 mm	75 mm	V143044-X	173.00
.1260	3.200 mm	.377	**9.60 mm**	**(3x)**	12.37 mm	.58 mm	4 mm	63 mm	V241601-X	58.50
.1260	3.200 mm	.629	**16.00 mm**	**(5x)**	19.09 mm	.58 mm	4 mm	63 mm	V864366-X	75.50
.1260	3.200 mm	1.007	**25.60 mm**	**(8x)**	29.17 mm	.58 mm	4 mm	75 mm	V191656-X	173.00
.1300	3.300 mm	.389	**9.90 mm**	**(3x)**	12.75 mm	.60 mm	4 mm	63 mm	V446101-X	58.50
.1300	3.300 mm	.649	**16.50 mm**	**(5x)**	19.68 mm	.60 mm	4 mm	63 mm	V427484-X	75.50
.1300	3.300 mm	1.039	**26.40 mm**	**(8x)**	30.08 mm	.60 mm	4 mm	75 mm	V274069-X	173.00
.1338	3.400 mm	.401	**10.20 mm**	**(3x)**	13.14 mm	.62 mm	4 mm	63 mm	V345119-X	58.50
.1338	3.400 mm	.669	**17.00 mm**	**(5x)**	20.28 mm	.62 mm	4 mm	63 mm	V570427-X	75.50
.1338	3.400 mm	1.070	**27.20 mm**	**(8x)**	30.99 mm	.62 mm	4 mm	75 mm	V471156-X	173.00
.1377	3.500 mm	.413	**10.50 mm**	**(3x)**	13.53 mm	.64 mm	4 mm	63 mm	V219223-X	58.50
.1377	3.500 mm	.688	**17.50 mm**	**(5x)**	20.88 mm	.64 mm	4 mm	63 mm	V969665-X	75.50
.1377	3.500 mm	1.102	**28.00 mm**	**(8x)**	31.90 mm	.64 mm	4 mm	75 mm	V715223-X	173.00
.1406 (9/64)	3.571 mm	.421	**10.70 mm**	**(3x)**	13.80 mm	.65 mm	4 mm	63 mm	V119018-X	58.50
.1406 (9/64)	3.571 mm	.702	**17.85 mm**	**(5x)**	21.30 mm	.65 mm	4 mm	63 mm	V859368-X	75.50
.1406 (9/64)	3.571 mm	1.124	**28.55 mm**	**(8x)**	32.55 mm	.65 mm	4 mm	75 mm	V711502-X	173.00
.1417	3.600 mm	.425	**10.80 mm**	**(3x)**	13.91 mm	.66 mm	4 mm	63 mm	V171654-X	58.50
.1417	3.600 mm	.708	**18.00 mm**	**(5x)**	21.47 mm	.66 mm	4 mm	63 mm	V306978-X	75.50
.1417	3.600 mm	1.133	**28.80 mm**	**(8x)**	32.81 mm	.66 mm	4 mm	75 mm	V463513-X	173.00
.1456	3.700 mm	.437	**11.10 mm**	**(3x)**	14.30 mm	.67 mm	4 mm	63 mm	V372278-X	58.50
.1456	3.700 mm	.728	**18.50 mm**	**(5x)**	22.07 mm	.67 mm	4 mm	63 mm	V418855-X	75.50
.1456	3.700 mm	1.165	**29.60 mm**	**(8x)**	33.72 mm	.67 mm	4 mm	75 mm	V648706-X	173.00
.1496	3.800 mm	.448	**11.40 mm**	**(3x)**	14.69 mm	.69 mm	4 mm	63 mm	V381981-X	58.50
.1496	3.800 mm	.748	**19.00 mm**	**(5x)**	22.67 mm	.69 mm	4 mm	63 mm	V770195-X	75.50
.1496	3.800 mm	1.196	**30.40 mm**	**(8x)**	34.64 mm	.69 mm	4 mm	75 mm	V511673-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 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	.460	**11.70 mm**	**(3x)**	15.07 mm	.71 mm	4 mm	63 mm	V464029-X	58.50
.1535	3.900 mm	.767	**19.50 mm**	**(5x)**	23.26 mm	.71 mm	4 mm	63 mm	V916343-X	75.50
.1535	3.900 mm	1.228	**31.20 mm**	**(8x)**	35.55 mm	.71 mm	4 mm	75 mm	V641665-X	173.00
.1562 (5/32)	3.968 mm	.468	**11.90 mm**	**(3x)**	15.34 mm	.72 mm	4 mm	63 mm	V535133-X	58.50
.1562 (5/32)	3.968 mm	.781	**19.85 mm**	**(5x)**	23.67 mm	.72 mm	4 mm	63 mm	V651106-X	75.50
.1562 (5/32)	3.968 mm	1.249	**31.75 mm**	**(8x)**	36.17 mm	.72 mm	4 mm	75 mm	V484175-X	173.00
.1574	4.000 mm	.472	**12.00 mm**	**(3x)**	15.46 mm	.73 mm	6 mm	63 mm	V956543-X	62.50
.1574	4.000 mm	.787	**20.00 mm**	**(5x)**	23.86 mm	.73 mm	6 mm	75 mm	V973327-X	77.50
.1574	4.000 mm	1.259	**32.00 mm**	**(8x)**	36.46 mm	.73 mm	6 mm	100 mm	V228877-X	173.00
.1614	4.100 mm	.484	**12.30 mm**	**(3x)**	15.85 mm	.75 mm	6 mm	63 mm	V144711-X	62.50
.1614	4.100 mm	.807	**20.50 mm**	**(5x)**	24.46 mm	.75 mm	6 mm	75 mm	V159304-X	77.50
.1614	4.100 mm	1.291	**32.80 mm**	**(8x)**	37.37 mm	.75 mm	6 mm	100 mm	V830649-X	173.00
.1653	4.200 mm	.496	**12.60 mm**	**(3x)**	16.23 mm	.76 mm	6 mm	63 mm	V691502-X	62.50
.1653	4.200 mm	.826	**21.00 mm**	**(5x)**	25.05 mm	.76 mm	6 mm	75 mm	V390642-X	77.50
.1653	4.200 mm	1.322	**33.60 mm**	**(8x)**	38.28 mm	.76 mm	6 mm	100 mm	V717833-X	173.00
.1692	4.300 mm	.507	**12.90 mm**	**(3x)**	16.62 mm	.78 mm	6 mm	63 mm	V853410-X	62.50
.1692	4.300 mm	.846	**21.50 mm**	**(5x)**	25.65 mm	.78 mm	6 mm	75 mm	V641050-X	77.50
.1692	4.300 mm	1.354	**34.40 mm**	**(8x)**	39.19 mm	.78 mm	6 mm	100 mm	V349549-X	173.00
.1718 (11/64)	4.365 mm	.515	**13.10 mm**	**(3x)**	16.87 mm	.79 mm	6 mm	63 mm	V690088-X	62.50
.1718 (11/64)	4.365 mm	.860	**21.85 mm**	**(5x)**	26.04 mm	.79 mm	6 mm	75 mm	V202897-X	77.50
.1718 (11/64)	4.365 mm	1.374	**34.90 mm**	**(8x)**	39.79 mm	.79 mm	6 mm	100 mm	V430080-X	173.00
.1732	4.400 mm	.519	**13.20 mm**	**(3x)**	17.01 mm	.80 mm	6 mm	63 mm	V696930-X	62.50
.1732	4.400 mm	.866	**22.00 mm**	**(5x)**	26.25 mm	.80 mm	6 mm	75 mm	V454165-X	77.50
.1732	4.400 mm	1.385	**35.20 mm**	**(8x)**	40.11 mm	.80 mm	6 mm	100 mm	V609491-X	173.00
.1771	4.500 mm	.531	**13.50 mm**	**(3x)**	17.39 mm	.82 mm	6 mm	63 mm	V945678-X	62.50
.1771	4.500 mm	.885	**22.50 mm**	**(5x)**	26.84 mm	.82 mm	6 mm	75 mm	V104541-X	77.50
.1771	4.500 mm	1.417	**36.00 mm**	**(8x)**	41.02 mm	.82 mm	6 mm	100 mm	V997034-X	173.00
.1811	4.600 mm	.543	**13.80 mm**	**(3x)**	17.78 mm	.84 mm	6 mm	63 mm	V587145-X	62.50
.1811	4.600 mm	.905	**23.00 mm**	**(5x)**	27.44 mm	.84 mm	6 mm	75 mm	V781819-X	77.50
.1811	4.600 mm	1.448	**36.80 mm**	**(8x)**	41.93 mm	.84 mm	6 mm	100 mm	V997000-X	173.00
.1850	4.700 mm	.555	**14.10 mm**	**(3x)**	18.17 mm	.86 mm	6 mm	63 mm	V846796-X	62.50
.1850	4.700 mm	.925	**23.50 mm**	**(5x)**	28.04 mm	.86 mm	6 mm	75 mm	V824714-X	77.50
.1850	4.700 mm	1.480	**37.60 mm**	**(8x)**	42.84 mm	.86 mm	6 mm	100 mm	V896167-X	173.00
.1875 (3/16)	4.762 mm	.562	**14.30 mm**	**(3x)**	18.41 mm	.87 mm	6 mm	63 mm	V400615-X	62.50
.1875 (3/16)	4.762 mm	.937	**23.80 mm**	**(5x)**	28.41 mm	.87 mm	6 mm	75 mm	V236564-X	77.50
.1875 (3/16)	4.762 mm	1.499	**38.10 mm**	**(8x)**	43.41 mm	.87 mm	6 mm	100 mm	V126929-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 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	.566	**14.40 mm**	**(3x)**	18.55 mm	.87 mm	6 mm	63 mm	V834057-X	62.50
.1890	4.800 mm	.944	**24.00 mm**	**(5x)**	28.63 mm	.87 mm	6 mm	75 mm	V321709-X	77.50
.1890	4.800 mm	1.511	**38.40 mm**	**(8x)**	43.75 mm	.87 mm	6 mm	100 mm	V290220-X	173.00
.1930	4.900 mm	.578	**14.70 mm**	**(3x)**	18.94 mm	.89 mm	6 mm	63 mm	V745413-X	62.50
.1930	4.900 mm	.964	**24.50 mm**	**(5x)**	29.23 mm	.89 mm	6 mm	75 mm	V381771-X	77.50
.1930	4.900 mm	1.543	**39.20 mm**	**(8x)**	44.66 mm	.89 mm	6 mm	100 mm	V449962-X	173.00
.1968	5.000 mm	.590	**15.00 mm**	**(3x)**	19.33 mm	.91 mm	6 mm	63 mm	V810779-X	62.50
.1968	5.000 mm	.984	**25.00 mm**	**(5x)**	29.83 mm	.91 mm	6 mm	75 mm	V661786-X	77.50
.1968	5.000 mm	1.574	**40.00 mm**	**(8x)**	45.58 mm	.91 mm	6 mm	100 mm	V727149-X	173.00
.2007	5.100 mm	.602	**15.30 mm**	**(3x)**	19.71 mm	.93 mm	6 mm	63 mm	V558333-X	62.50
.2007	5.100 mm	1.003	**25.50 mm**	**(5x)**	30.42 mm	.93 mm	6 mm	75 mm	V683701-X	77.50
.2007	5.100 mm	1.606	**40.80 mm**	**(8x)**	46.49 mm	.93 mm	6 mm	100 mm	V445203-X	173.00
.2031 (13/64)	5.159 mm	.610	**15.50 mm**	**(3x)**	19.94 mm	.94 mm	6 mm	63 mm	V536622-X	62.50
.2031 (13/64)	5.159 mm	1.015	**25.80 mm**	**(5x)**	30.77 mm	.94 mm	6 mm	75 mm	V743431-X	77.50
.2031 (13/64)	5.159 mm	1.624	**41.25 mm**	**(8x)**	47.02 mm	.94 mm	6 mm	100 mm	V479533-X	173.00
.2047	5.200 mm	.614	**15.60 mm**	**(3x)**	20.10 mm	.95 mm	6 mm	63 mm	V603666-X	62.50
.2047	5.200 mm	1.023	**26.00 mm**	**(5x)**	31.02 mm	.95 mm	6 mm	75 mm	V663747-X	77.50
.2047	5.200 mm	1.637	**41.60 mm**	**(8x)**	47.40 mm	.95 mm	6 mm	100 mm	V984977-X	173.00
.2086	5.300 mm	.625	**15.90 mm**	**(3x)**	20.49 mm	.96 mm	6 mm	63 mm	V612145-X	62.50
.2086	5.300 mm	1.043	**26.50 mm**	**(5x)**	31.62 mm	.96 mm	6 mm	75 mm	V947811-X	77.50
.2086	5.300 mm	1.669	**42.40 mm**	**(8x)**	48.31 mm	.96 mm	6 mm	100 mm	V464644-X	173.00
.2125	5.400 mm	.637	**16.20 mm**	**(3x)**	20.87 mm	.98 mm	6 mm	63 mm	V103818-X	62.50
.2125	5.400 mm	1.062	**27.00 mm**	**(5x)**	32.21 mm	.98 mm	6 mm	75 mm	V231435-X	77.50
.2125	5.400 mm	1.700	**43.20 mm**	**(8x)**	49.22 mm	.98 mm	6 mm	100 mm	V848179-X	173.00
.2165	5.500 mm	.649	**16.50 mm**	**(3x)**	21.26 mm	1.00 mm	6 mm	63 mm	V245936-X	62.50
.2165	5.500 mm	1.082	**27.50 mm**	**(5x)**	32.81 mm	1.00 mm	6 mm	75 mm	V590469-X	77.50
.2165	5.500 mm	1.732	**44.00 mm**	**(8x)**	50.13 mm	1.00 mm	6 mm	100 mm	V881807-X	173.00
.2187 (7/32)	5.556 mm	.655	**16.65 mm**	**(3x)**	21.47 mm	1.01 mm	6 mm	63 mm	V412034-X	62.50
.2187 (7/32)	5.556 mm	1.094	**27.80 mm**	**(5x)**	33.14 mm	1.01 mm	6 mm	75 mm	V550391-X	77.50
.2187 (7/32)	5.556 mm	1.749	**44.45 mm**	**(8x)**	50.64 mm	1.01 mm	6 mm	100 mm	V682954-X	173.00
.2205	5.600 mm	.661	**16.80 mm**	**(3x)**	21.65 mm	1.02 mm	6 mm	63 mm	V869257-X	62.50
.2205	5.600 mm	1.102	**28.00 mm**	**(5x)**	33.41 mm	1.02 mm	6 mm	75 mm	V885614-X	77.50
.2205	5.600 mm	1.763	**44.80 mm**	**(8x)**	51.05 mm	1.02 mm	6 mm	100 mm	V372811-X	173.00
.2244	5.700 mm	.673	**17.10 mm**	**(3x)**	22.03 mm	1.04 mm	6 mm	63 mm	V911021-X	62.50
.2244	5.700 mm	1.122	**28.50 mm**	**(5x)**	34.00 mm	1.04 mm	6 mm	75 mm	V674875-X	77.50
.2244	5.700 mm	1.795	**45.60 mm**	**(8x)**	51.96 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	.685	**17.40 mm**	**(3x)**	22.42 mm	1.06 mm	6 mm	63 mm	V439914-X	62.50
.2283	5.800 mm	1.141	**29.00 mm**	**(5x)**	34.60 mm	1.06 mm	6 mm	75 mm	V260690-X	77.50
.2283	5.800 mm	1.826	**46.40 mm**	**(8x)**	52.87 mm	1.06 mm	6 mm	100 mm	V751036-X	173.00
.2322	5.900 mm	.696	**17.70 mm**	**(3x)**	22.80 mm	1.07 mm	6 mm	63 mm	V603655-X	62.50
.2322	5.900 mm	1.161	**29.50 mm**	**(5x)**	35.19 mm	1.07 mm	6 mm	75 mm	V519010-X	77.50
.2322	5.900 mm	1.858	**47.20 mm**	**(8x)**	53.78 mm	1.07 mm	6 mm	100 mm	V549472-X	173.00
.2343 (15/64)	5.953 mm	.702	**17.85 mm**	**(3x)**	23.01 mm	1.08 mm	6 mm	63 mm	V458998-X	62.50
.2343 (15/64)	5.953 mm	1.171	**29.75 mm**	**(5x)**	35.51 mm	1.08 mm	6 mm	75 mm	V623370-X	77.50
.2343 (15/64)	5.953 mm	1.874	**47.60 mm**	**(8x)**	54.26 mm	1.08 mm	6 mm	100 mm	V445403-X	173.00
.2362	6.000 mm	.708	**18.00 mm**	**(3x)**	23.19 mm	1.09 mm	8 mm	75 mm	V106008-X	62.50
.2362	6.000 mm	1.181	**30.00 mm**	**(5x)**	35.79 mm	1.09 mm	8 mm	100 mm	V170131-X	77.50
.2362	6.000 mm	1.889	**48.00 mm**	**(8x)**	54.69 mm	1.09 mm	8 mm	125 mm	V345369-X	173.00
.2401	6.100 mm	.720	**18.30 mm**	**(3x)**	23.58 mm	1.11 mm	8 mm	75 mm	V786634-X	75.00
.2401	6.100 mm	1.200	**30.50 mm**	**(5x)**	36.39 mm	1.11 mm	8 mm	100 mm	V638795-X	89.50
.2401	6.100 mm	1.921	**48.80 mm**	**(8x)**	55.60 mm	1.11 mm	8 mm	125 mm	V492775-X	181.00
.2440	6.200 mm	.732	**18.60 mm**	**(3x)**	23.96 mm	1.13 mm	8 mm	75 mm	V156414-X	75.00
.2440	6.200 mm	1.220	**31.00 mm**	**(5x)**	36.98 mm	1.13 mm	8 mm	100 mm	V246074-X	89.50
.2440	6.200 mm	1.952	**49.60 mm**	**(8x)**	56.51 mm	1.13 mm	8 mm	125 mm	V936607-X	181.00
.2480	6.300 mm	.744	**18.90 mm**	**(3x)**	24.35 mm	1.15 mm	8 mm	75 mm	V252509-X	75.00
.2480	6.300 mm	1.240	**31.50 mm**	**(5x)**	37.58 mm	1.15 mm	8 mm	100 mm	V349769-X	89.50
.2480	6.300 mm	1.984	**50.40 mm**	**(8x)**	57.43 mm	1.15 mm	8 mm	125 mm	V272919-X	181.00
.2500 (1/4)	6.350 mm	.749	**19.05 mm**	**(3x)**	24.54 mm	1.16 mm	8 mm	75 mm	V809169-X	75.00
.2500 (1/4)	6.350 mm	1.249	**31.75 mm**	**(5x)**	37.88 mm	1.16 mm	8 mm	100 mm	V715183-X	89.50
.2500 (1/4)	6.350 mm	1.999	**50.80 mm**	**(8x)**	57.88 mm	1.16 mm	8 mm	125 mm	V316828-X	181.00
.2520	6.400 mm	.755	**19.20 mm**	**(3x)**	24.74 mm	1.16 mm	8 mm	75 mm	V343209-X	75.00
.2520	6.400 mm	1.259	**32.00 mm**	**(5x)**	38.18 mm	1.16 mm	8 mm	100 mm	V664864-X	89.50
.2520	6.400 mm	2.015	**51.20 mm**	**(8x)**	58.34 mm	1.16 mm	8 mm	125 mm	V449441-X	181.00

* For h6 and h8 tolerances, see page 8.

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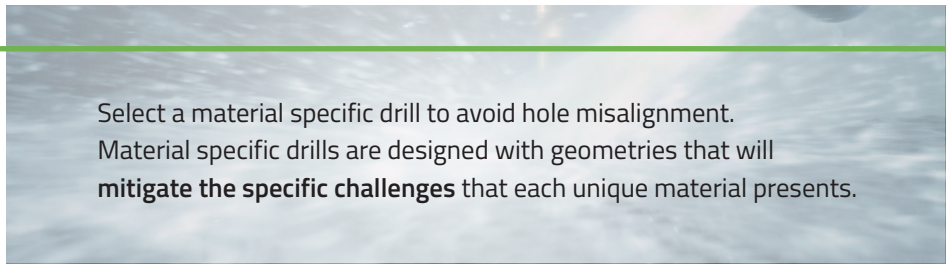
Tech Tip



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	.767	**19.50 mm**	**(3x)**	25.12 mm	1.18 mm	8 mm	75 mm	V749006-X	75.00
.2559	6.500 mm	1.279	**32.50 mm**	**(5x)**	38.77 mm	1.18 mm	8 mm	100 mm	V976126-X	89.50
.2559	6.500 mm	2.047	**52.00 mm**	**(8x)**	59.25 mm	1.18 mm	8 mm	125 mm	V426083-X	181.00
.2598	6.600 mm	.779	**19.80 mm**	**(3x)**	25.51 mm	1.20 mm	8 mm	75 mm	V734311-X	78.50
.2598	6.600 mm	1.299	**33.00 mm**	**(5x)**	39.37 mm	1.20 mm	8 mm	100 mm	V321248-X	92.50
.2598	6.600 mm	2.078	**52.80 mm**	**(8x)**	60.16 mm	1.20 mm	8 mm	125 mm	V978161-X	202.00
.2638	6.700 mm	.791	**20.10 mm**	**(3x)**	25.90 mm	1.22 mm	8 mm	75 mm	V695757-X	78.50
.2638	6.700 mm	1.318	**33.50 mm**	**(5x)**	39.97 mm	1.22 mm	8 mm	100 mm	V609211-X	92.50
.2638	6.700 mm	2.110	**53.60 mm**	**(8x)**	61.07 mm	1.22 mm	8 mm	125 mm	V416647-X	202.00
.2656 (17/64)	6.746 mm	.797	**20.25 mm**	**(3x)**	26.08 mm	1.23 mm	8 mm	75 mm	V577636-X	78.50
.2656 (17/64)	6.746 mm	1.328	**33.75 mm**	**(5x)**	40.24 mm	1.23 mm	8 mm	100 mm	V734759-X	92.50
.2656 (17/64)	6.746 mm	2.124	**53.95 mm**	**(8x)**	61.49 mm	1.23 mm	8 mm	125 mm	V738825-X	202.00
.2677	6.800 mm	.803	**20.40 mm**	**(3x)**	26.28 mm	1.24 mm	8 mm	75 mm	V338596-X	78.50
.2677	6.800 mm	1.338	**34.00 mm**	**(5x)**	40.56 mm	1.24 mm	8 mm	100 mm	V913970-X	92.50
.2677	6.800 mm	2.141	**54.40 mm**	**(8x)**	61.98 mm	1.24 mm	8 mm	125 mm	V219307-X	202.00
.2717	6.900 mm	.814	**20.70 mm**	**(3x)**	26.67 mm	1.26 mm	8 mm	75 mm	V291064-X	78.50
.2717	6.900 mm	1.358	**34.50 mm**	**(5x)**	41.16 mm	1.26 mm	8 mm	100 mm	V531112-X	92.50
.2717	6.900 mm	2.173	**55.20 mm**	**(8x)**	62.90 mm	1.26 mm	8 mm	125 mm	V950623-X	202.00
.2756	7.000 mm	.826	**21.00 mm**	**(3x)**	27.06 mm	1.27 mm	8 mm	75 mm	V663641-X	78.50
.2756	7.000 mm	1.377	**35.00 mm**	**(5x)**	41.76 mm	1.27 mm	8 mm	100 mm	V410825-X	92.50
.2756	7.000 mm	2.204	**56.00 mm**	**(8x)**	63.81 mm	1.27 mm	8 mm	125 mm	V604383-X	202.00
.2795	7.100 mm	.838	**21.30 mm**	**(3x)**	27.44 mm	1.29 mm	8 mm	75 mm	V600397-X	79.50
.2795	7.100 mm	1.397	**35.50 mm**	**(5x)**	42.35 mm	1.29 mm	8 mm	100 mm	V637495-X	97.50
.2795	7.100 mm	2.236	**56.80 mm**	**(8x)**	64.72 mm	1.29 mm	8 mm	125 mm	V993349-X	212.50
.2812 (9/32)	7.142 mm	.844	**21.45 mm**	**(3x)**	27.61 mm	1.30 mm	8 mm	75 mm	V952277-X	79.50
.2812 (9/32)	7.142 mm	1.405	**35.70 mm**	**(5x)**	42.60 mm	1.30 mm	8 mm	100 mm	V425690-X	97.50
.2812 (9/32)	7.142 mm	2.249	**57.15 mm**	**(8x)**	65.10 mm	1.30 mm	8 mm	125 mm	V956378-X	212.50
.2834	7.200 mm	.850	**21.60 mm**	**(3x)**	27.83 mm	1.31 mm	8 mm	75 mm	V226899-X	79.50
.2834	7.200 mm	1.417	**36.00 mm**	**(5x)**	42.95 mm	1.31 mm	8 mm	100 mm	V657275-X	97.50
.2834	7.200 mm	2.267	**57.60 mm**	**(8x)**	65.63 mm	1.31 mm	8 mm	125 mm	V672970-X	212.50
.2874	7.300 mm	.862	**21.90 mm**	**(3x)**	28.22 mm	1.33 mm	8 mm	75 mm	V653370-X	79.50
.2874	7.300 mm	1.437	**36.50 mm**	**(5x)**	43.55 mm	1.33 mm	8 mm	100 mm	V195918-X	97.50
.2874	7.300 mm	2.299	**58.40 mm**	**(8x)**	66.54 mm	1.33 mm	8 mm	125 mm	V727542-X	212.50
.2913	7.400 mm	.874	**22.20 mm**	**(3x)**	28.60 mm	1.35 mm	8 mm	75 mm	V489342-X	79.50
.2913	7.400 mm	1.456	**37.00 mm**	**(5x)**	44.14 mm	1.35 mm	8 mm	100 mm	V795527-X	97.50
.2913	7.400 mm	2.330	**59.20 mm**	**(8x)**	67.45 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	.885	**22.50 mm**	**(3x)**	28.99 mm	1.36 mm	8 mm	75 mm	V148315-X	79.50
.2952	7.500 mm	1.476	**37.50 mm**	**(5x)**	44.74 mm	1.36 mm	8 mm	100 mm	V103072-X	97.50
.2952	7.500 mm	2.362	**60.00 mm**	**(8x)**	68.37 mm	1.36 mm	8 mm	125 mm	V145153-X	212.50
.2969 (19/64)	7.541 mm	.889	**22.60 mm**	**(3x)**	29.15 mm	1.37 mm	8 mm	75 mm	V285522-X	79.50
.2969 (19/64)	7.541 mm	1.484	**37.70 mm**	**(5x)**	44.99 mm	1.37 mm	8 mm	100 mm	V850668-X	97.50
.2969 (19/64)	7.541 mm	2.375	**60.35 mm**	**(8x)**	68.74 mm	1.37 mm	8 mm	125 mm	V781588-X	212.50
.2992	7.600 mm	.897	**22.80 mm**	**(3x)**	29.38 mm	1.38 mm	8 mm	75 mm	V558243-X	79.50
.2992	7.600 mm	1.496	**38.00 mm**	**(5x)**	45.34 mm	1.38 mm	8 mm	100 mm	V707294-X	97.50
.2992	7.600 mm	2.393	**60.80 mm**	**(8x)**	69.28 mm	1.38 mm	8 mm	125 mm	V944678-X	212.50
.3031	7.700 mm	.909	**23.10 mm**	**(3x)**	29.76 mm	1.40 mm	8 mm	75 mm	V515094-X	79.50
.3031	7.700 mm	1.515	**38.50 mm**	**(5x)**	45.93 mm	1.40 mm	8 mm	100 mm	V323536-X	97.50
.3031	7.700 mm	2.425	**61.60 mm**	**(8x)**	70.19 mm	1.40 mm	8 mm	125 mm	V316193-X	212.50
.3071	7.800 mm	.921	**23.40 mm**	**(3x)**	30.15 mm	1.42 mm	8 mm	75 mm	V613783-X	79.50
.3071	7.800 mm	1.535	**39.00 mm**	**(5x)**	46.53 mm	1.42 mm	8 mm	100 mm	V225740-X	97.50
.3071	7.800 mm	2.456	**62.40 mm**	**(8x)**	71.10 mm	1.42 mm	8 mm	125 mm	V543502-X	212.50
.3110	7.900 mm	.933	**23.70 mm**	**(3x)**	30.54 mm	1.44 mm	8 mm	75 mm	V643419-X	79.50
.3110	7.900 mm	1.555	**39.50 mm**	**(5x)**	47.13 mm	1.44 mm	8 mm	100 mm	V962384-X	97.50
.3110	7.900 mm	2.488	**63.20 mm**	**(8x)**	72.01 mm	1.44 mm	8 mm	125 mm	V199008-X	212.50
.3125 (5/16)	7.937 mm	.937	**23.80 mm**	**(3x)**	30.68 mm	1.44 mm	8 mm	75 mm	V922027-X	79.50
.3125 (5/16)	7.937 mm	1.562	**39.70 mm**	**(5x)**	47.35 mm	1.44 mm	8 mm	100 mm	V962711-X	97.50
.3125 (5/16)	7.937 mm	2.499	**63.50 mm**	**(8x)**	72.35 mm	1.44 mm	8 mm	125 mm	V832006-X	212.50
.3150	8.000 mm	.944	**24.00 mm**	**(3x)**	30.92 mm	1.46 mm	10 mm	75 mm	V437355-X	79.50
.3150	8.000 mm	1.574	**40.00 mm**	**(5x)**	47.72 mm	1.46 mm	10 mm	100 mm	V432969-X	97.50
.3150	8.000 mm	2.519	**64.00 mm**	**(8x)**	72.92 mm	1.46 mm	10 mm	125 mm	V414548-X	212.50
.3189	8.100 mm	.956	**24.30 mm**	**(3x)**	31.31 mm	1.47 mm	10 mm	75 mm	V172150-X	95.00
.3189	8.100 mm	1.594	**40.50 mm**	**(5x)**	48.32 mm	1.47 mm	10 mm	100 mm	V805974-X	108.50
.3189	8.100 mm	2.551	**64.80 mm**	**(8x)**	73.84 mm	1.47 mm	10 mm	125 mm	V784040-X	241.50
.3228	8.200 mm	.968	**24.60 mm**	**(3x)**	31.70 mm	1.49 mm	10 mm	75 mm	V104389-X	95.00
.3228	8.200 mm	1.614	**41.00 mm**	**(5x)**	48.92 mm	1.49 mm	10 mm	100 mm	V797513-X	108.50
.3228	8.200 mm	2.582	**65.60 mm**	**(8x)**	74.75 mm	1.49 mm	10 mm	125 mm	V889280-X	241.50
.3268	8.300 mm	.980	**24.90 mm**	**(3x)**	32.08 mm	1.51 mm	10 mm	75 mm	V431404-X	95.00
.3268	8.300 mm	1.633	**41.50 mm**	**(5x)**	49.51 mm	1.51 mm	10 mm	100 mm	V464819-X	108.50
.3268	8.300 mm	2.614	**66.40 mm**	**(8x)**	75.66 mm	1.51 mm	10 mm	125 mm	V922989-X	241.50
.3281 (21/64)	8.333 mm	.984	**25.00 mm**	**(3x)**	32.21 mm	1.52 mm	10 mm	75 mm	V729711-X	95.00
.3281 (21/64)	8.333 mm	1.639	**41.65 mm**	**(5x)**	49.71 mm	1.52 mm	10 mm	100 mm	V276452-X	108.50
.3281 (21/64)	8.333 mm	2.624	**66.65 mm**	**(8x)**	75.96 mm	1.52 mm	10 mm	125 mm	V423225-X	241.50

* For h6 and h8 tolerances, see page 8.

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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	.992	**25.20 mm**	**(3x)**	32.47 mm	1.53 mm	10 mm	75 mm	V846086-X	95.00
.3307	8.400 mm	1.653	**42.00 mm**	**(5x)**	50.11 mm	1.53 mm	10 mm	100 mm	V619529-X	108.50
.3307	8.400 mm	2.645	**67.20 mm**	**(8x)**	76.57 mm	1.53 mm	10 mm	125 mm	V772576-X	241.50
.3346	8.500 mm	1.003	**25.50 mm**	**(3x)**	32.86 mm	1.55 mm	10 mm	75 mm	V285498-X	95.00
.3346	8.500 mm	1.673	**42.50 mm**	**(5x)**	50.71 mm	1.55 mm	10 mm	100 mm	V767363-X	108.50
.3346	8.500 mm	2.677	**68.00 mm**	**(8x)**	77.48 mm	1.55 mm	10 mm	125 mm	V593996-X	241.50
.3386	8.600 mm	1.015	**25.80 mm**	**(3x)**	33.24 mm	1.57 mm	10 mm	75 mm	V333326-X	95.00
.3386	8.600 mm	1.692	**43.00 mm**	**(5x)**	51.30 mm	1.57 mm	10 mm	100 mm	V713312-X	108.50
.3386	8.600 mm	2.708	**68.80 mm**	**(8x)**	78.39 mm	1.57 mm	10 mm	125 mm	V627207-X	241.50
.3425	8.700 mm	1.027	**26.10 mm**	**(3x)**	33.63 mm	1.58 mm	10 mm	75 mm	V812806-X	95.00
.3425	8.700 mm	1.712	**43.50 mm**	**(5x)**	51.90 mm	1.58 mm	10 mm	100 mm	V322323-X	108.50
.3425	8.700 mm	2.740	**69.60 mm**	**(8x)**	79.30 mm	1.58 mm	10 mm	125 mm	V697981-X	241.50
.3438 (11/32)	8.732 mm	1.031	**26.20 mm**	**(3x)**	33.75 mm	1.59 mm	10 mm	75 mm	V270614-X	95.00
.3438 (11/32)	8.732 mm	1.718	**43.65 mm**	**(5x)**	52.09 mm	1.59 mm	10 mm	100 mm	V831670-X	108.50
.3438 (11/32)	8.732 mm	2.749	**69.85 mm**	**(8x)**	79.60 mm	1.59 mm	10 mm	125 mm	V867816-X	241.50
.3465	8.800 mm	1.039	**26.40 mm**	**(3x)**	34.02 mm	1.60 mm	10 mm	75 mm	V243786-X	95.00
.3465	8.800 mm	1.732	**44.00 mm**	**(5x)**	52.50 mm	1.60 mm	10 mm	100 mm	V523931-X	108.50
.3465	8.800 mm	2.771	**70.40 mm**	**(8x)**	80.22 mm	1.60 mm	10 mm	125 mm	V231271-X	241.50
.3504	8.900 mm	1.051	**26.70 mm**	**(3x)**	34.40 mm	1.62 mm	10 mm	75 mm	V978768-X	95.00
.3504	8.900 mm	1.751	**44.50 mm**	**(5x)**	53.09 mm	1.62 mm	10 mm	100 mm	V367699-X	108.50
.3504	8.900 mm	2.803	**71.20 mm**	**(8x)**	81.13 mm	1.62 mm	10 mm	150 mm	V699423-X	241.50
.3543	9.000 mm	1.062	**27.00 mm**	**(3x)**	34.79 mm	1.64 mm	10 mm	75 mm	V820250-X	95.00
.3543	9.000 mm	1.771	**45.00 mm**	**(5x)**	53.69 mm	1.64 mm	10 mm	100 mm	V605839-X	108.50
.3543	9.000 mm	2.834	**72.00 mm**	**(8x)**	82.04 mm	1.64 mm	10 mm	150 mm	V477581-X	241.50
.3583	9.100 mm	1.074	**27.30 mm**	**(3x)**	35.18 mm	1.66 mm	10 mm	75 mm	V926579-X	101.00
.3583	9.100 mm	1.791	**45.50 mm**	**(5x)**	54.29 mm	1.66 mm	10 mm	100 mm	V227340-X	119.00
.3583	9.100 mm	2.866	**72.80 mm**	**(8x)**	82.95 mm	1.66 mm	10 mm	150 mm	V387177-X	254.50
.3594 (23/64)	9.128 mm	1.078	**27.40 mm**	**(3x)**	35.28 mm	1.66 mm	10 mm	75 mm	V520702-X	101.00
.3594 (23/64)	9.128 mm	1.797	**45.65 mm**	**(5x)**	54.45 mm	1.66 mm	10 mm	100 mm	V831468-X	119.00
.3594 (23/64)	9.128 mm	2.874	**73.00 mm**	**(8x)**	83.21 mm	1.66 mm	10 mm	150 mm	V492754-X	254.50
.3622	9.200 mm	1.086	**27.60 mm**	**(3x)**	35.56 mm	1.67 mm	10 mm	75 mm	V861199-X	101.00
.3622	9.200 mm	1.811	**46.00 mm**	**(5x)**	54.88 mm	1.67 mm	10 mm	100 mm	V909379-X	119.00
.3622	9.200 mm	2.897	**73.60 mm**	**(8x)**	83.86 mm	1.67 mm	10 mm	150 mm	V273373-X	254.50
.3661	9.300 mm	1.098	**27.90 mm**	**(3x)**	35.95 mm	1.69 mm	10 mm	75 mm	V341438-X	101.00
.3661	9.300 mm	1.830	**46.50 mm**	**(5x)**	55.48 mm	1.69 mm	10 mm	100 mm	V750726-X	119.00
.3661	9.300 mm	2.929	**74.40 mm**	**(8x)**	84.77 mm	1.69 mm	10 mm	150 mm	V491242-X	254.50

* 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		
.3701	9.400 mm	1.110	**28.20 mm**	**(3x)**	36.34 mm	1.71 mm	10 mm	75 mm	V245183-X	101.00
.3701	9.400 mm	1.850	**47.00 mm**	**(5x)**	56.08 mm	1.71 mm	10 mm	100 mm	V773243-X	119.00
.3701	9.400 mm	2.960	**75.20 mm**	**(8x)**	85.69 mm	1.71 mm	10 mm	150 mm	V292278-X	254.50
.3740	9.500 mm	1.122	**28.50 mm**	**(3x)**	36.72 mm	1.73 mm	10 mm	75 mm	V368486-X	101.00
.3740	9.500 mm	1.870	**47.50 mm**	**(5x)**	56.67 mm	1.73 mm	10 mm	100 mm	V767819-X	119.00
.3740	9.500 mm	2.992	**76.00 mm**	**(8x)**	86.60 mm	1.73 mm	10 mm	150 mm	V982412-X	254.50
.3750 (3/8)	9.525 mm	1.125	**28.60 mm**	**(3x)**	36.82 mm	1.73 mm	10 mm	75 mm	V543634-X	101.00
.3750 (3/8)	9.525 mm	1.875	**47.65 mm**	**(5x)**	56.82 mm	1.73 mm	10 mm	100 mm	V294737-X	119.00
.3750 (3/8)	9.525 mm	2.999	**76.20 mm**	**(8x)**	86.83 mm	1.73 mm	10 mm	150 mm	V643720-X	254.50
.3780	9.600 mm	1.133	**28.80 mm**	**(3x)**	37.11 mm	1.75 mm	10 mm	75 mm	V558947-X	101.00
.3780	9.600 mm	1.889	**48.00 mm**	**(5x)**	57.27 mm	1.75 mm	10 mm	100 mm	V407796-X	119.00
.3780	9.600 mm	3.023	**76.80 mm**	**(8x)**	87.51 mm	1.75 mm	10 mm	150 mm	V407240-X	254.50
.3819	9.700 mm	1.145	**29.10 mm**	**(3x)**	37.50 mm	1.77 mm	10 mm	75 mm	V934556-X	101.00
.3819	9.700 mm	1.909	**48.50 mm**	**(5x)**	57.87 mm	1.77 mm	10 mm	100 mm	V538795-X	119.00
.3819	9.700 mm	3.055	**77.60 mm**	**(8x)**	88.42 mm	1.77 mm	10 mm	150 mm	V417626-X	254.50
.3858	9.800 mm	1.157	**29.40 mm**	**(3x)**	37.88 mm	1.78 mm	10 mm	75 mm	V229427-X	101.00
.3858	9.800 mm	1.929	**49.00 mm**	**(5x)**	58.46 mm	1.78 mm	10 mm	100 mm	V750562-X	119.00
.3858	9.800 mm	3.086	**78.40 mm**	**(8x)**	89.33 mm	1.78 mm	10 mm	150 mm	V797339-X	254.50
.3898	9.900 mm	1.169	**29.70 mm**	**(3x)**	38.27 mm	1.80 mm	10 mm	75 mm	V869506-X	101.00
.3898	9.900 mm	1.948	**49.50 mm**	**(5x)**	59.06 mm	1.80 mm	10 mm	100 mm	V429736-X	119.00
.3898	9.900 mm	3.118	**79.20 mm**	**(8x)**	90.24 mm	1.80 mm	10 mm	150 mm	V304892-X	254.50
.3906 (25/64)	9.921 mm	1.171	**29.75 mm**	**(3x)**	38.35 mm	1.81 mm	10 mm	75 mm	V612861-X	101.00
.3906 (25/64)	9.921 mm	1.952	**49.60 mm**	**(5x)**	59.18 mm	1.81 mm	10 mm	100 mm	V804543-X	119.00
.3906 (25/64)	9.921 mm	3.124	**79.35 mm**	**(8x)**	90.44 mm	1.81 mm	10 mm	150 mm	V656076-X	254.50
.3937	10.000 mm	1.181	**30.00 mm**	**(3x)**	38.66 mm	1.82 mm	12 mm	100 mm	V562092-X	101.00
.3937	10.000 mm	1.968	**50.00 mm**	**(5x)**	59.66 mm	1.82 mm	12 mm	125 mm	V550034-X	119.00
.3937	10.000 mm	3.149	**80.00 mm**	**(8x)**	91.16 mm	1.82 mm	12 mm	150 mm	V834651-X	254.50
.3976	10.100 mm	1.192	**30.30 mm**	**(3x)**	39.04 mm	1.84 mm	12 mm	100 mm	V297691-X	136.00
.3976	10.100 mm	1.988	**50.50 mm**	**(5x)**	60.25 mm	1.84 mm	12 mm	125 mm	V717095-X	158.00
.3976	10.100 mm	3.181	**80.80 mm**	**(8x)**	92.07 mm	1.84 mm	12 mm	150 mm	V946266-X	331.00
.4016	10.200 mm	1.204	**30.60 mm**	**(3x)**	39.43 mm	1.86 mm	12 mm	100 mm	V829282-X	136.00
.4016	10.200 mm	2.007	**51.00 mm**	**(5x)**	60.85 mm	1.86 mm	12 mm	125 mm	V905204-X	158.00
.4016	10.200 mm	3.212	**81.60 mm**	**(8x)**	92.98 mm	1.86 mm	12 mm	150 mm	V984655-X	331.00
.4055	10.300 mm	1.216	**30.90 mm**	**(3x)**	39.82 mm	1.87 mm	12 mm	100 mm	V755643-X	136.00
.4055	10.300 mm	2.027	**51.50 mm**	**(5x)**	61.45 mm	1.87 mm	12 mm	125 mm	V473326-X	158.00
.4055	10.300 mm	3.244	**82.40 mm**	**(8x)**	93.89 mm	1.87 mm	12 mm	150 mm	V319140-X	331.00

* 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		
.4062 (13/32)	10.317 mm	1.218	**30.95 mm**	**(3x)**	39.88 mm	1.88 mm	12 mm	100 mm	V558064-X	136.00
.4062 (13/32)	10.317 mm	2.031	**51.60 mm**	**(5x)**	61.55 mm	1.88 mm	12 mm	125 mm	V617000-X	158.00
.4062 (13/32)	10.317 mm	3.249	**82.55 mm**	**(8x)**	94.05 mm	1.88 mm	12 mm	150 mm	V184156-X	331.00
.4094	10.400 mm	1.228	**31.20 mm**	**(3x)**	40.20 mm	1.89 mm	12 mm	100 mm	V476483-X	136.00
.4094	10.400 mm	2.047	**52.00 mm**	**(5x)**	62.04 mm	1.89 mm	12 mm	125 mm	V872922-X	158.00
.4094	10.400 mm	3.275	**83.20 mm**	**(8x)**	94.80 mm	1.89 mm	12 mm	150 mm	V997876-X	331.00
.4134	10.500 mm	1.240	**31.50 mm**	**(3x)**	40.59 mm	1.91 mm	12 mm	100 mm	V804705-X	136.00
.4134	10.500 mm	2.066	**52.50 mm**	**(5x)**	62.64 mm	1.91 mm	12 mm	125 mm	V656863-X	158.00
.4134	10.500 mm	3.307	**84.00 mm**	**(8x)**	95.71 mm	1.91 mm	12 mm	150 mm	V959781-X	331.00
.4173	10.600 mm	1.251	**31.80 mm**	**(3x)**	40.98 mm	1.93 mm	12 mm	100 mm	V716473-X	136.00
.4173	10.600 mm	2.086	**53.00 mm**	**(5x)**	63.24 mm	1.93 mm	12 mm	125 mm	V931959-X	158.00
.4173	10.600 mm	3.338	**84.80 mm**	**(8x)**	96.63 mm	1.93 mm	12 mm	150 mm	V589985-X	331.00
.4213	10.700 mm	1.263	**32.10 mm**	**(3x)**	41.36 mm	1.95 mm	12 mm	100 mm	V967963-X	136.00
.4213	10.700 mm	2.106	**53.50 mm**	**(5x)**	63.83 mm	1.95 mm	12 mm	125 mm	V260341-X	158.00
.4213	10.700 mm	3.370	**85.60 mm**	**(8x)**	97.54 mm	1.95 mm	12 mm	150 mm	V317299-X	331.00
.4219 (27/64)	10.716 mm	1.265	**32.15 mm**	**(3x)**	41.42 mm	1.95 mm	12 mm	100 mm	V248338-X	136.00
.4219 (27/64)	10.716 mm	2.110	**53.60 mm**	**(5x)**	63.93 mm	1.95 mm	12 mm	125 mm	V184802-X	158.00
.4219 (27/64)	10.716 mm	3.375	**85.75 mm**	**(8x)**	97.68 mm	1.95 mm	12 mm	150 mm	V459907-X	331.00
.4252	10.800 mm	1.275	**32.40 mm**	**(3x)**	41.75 mm	1.97 mm	12 mm	100 mm	V602726-X	136.00
.4252	10.800 mm	2.125	**54.00 mm**	**(5x)**	64.43 mm	1.97 mm	12 mm	125 mm	V247731-X	158.00
.4252	10.800 mm	3.401	**86.40 mm**	**(8x)**	98.45 mm	1.97 mm	12 mm	150 mm	V195896-X	331.00
.4291	10.900 mm	1.287	**32.70 mm**	**(3x)**	42.14 mm	1.98 mm	12 mm	100 mm	V429098-X	136.00
.4291	10.900 mm	2.145	**54.50 mm**	**(5x)**	65.03 mm	1.98 mm	12 mm	125 mm	V561591-X	158.00
.4291	10.900 mm	3.433	**87.20 mm**	**(8x)**	99.36 mm	1.98 mm	12 mm	175 mm	V726450-X	331.00
.4331	11.000 mm	1.299	**33.00 mm**	**(3x)**	42.52 mm	2.00 mm	12 mm	100 mm	V661693-X	136.00
.4331	11.000 mm	2.165	**55.00 mm**	**(5x)**	65.62 mm	2.00 mm	12 mm	125 mm	V111557-X	158.00
.4331	11.000 mm	3.464	**88.00 mm**	**(8x)**	100.27 mm	2.00 mm	12 mm	175 mm	V731416-X	331.00
.4370	11.100 mm	1.311	**33.30 mm**	**(3x)**	42.91 mm	2.02 mm	12 mm	100 mm	V144905-X	136.00
.4370	11.100 mm	2.185	**55.50 mm**	**(5x)**	66.22 mm	2.02 mm	12 mm	125 mm	V529674-X	158.00
.4370	11.100 mm	3.496	**88.80 mm**	**(8x)**	101.18 mm	2.02 mm	12 mm	175 mm	V768753-X	331.00
.4375 (7/16)	11.112 mm	1.312	**33.35 mm**	**(3x)**	42.95 mm	2.02 mm	12 mm	100 mm	V538378-X	136.00
.4375 (7/16)	11.112 mm	2.187	**55.55 mm**	**(5x)**	66.29 mm	2.02 mm	12 mm	125 mm	V533490-X	158.00
.4375 (7/16)	11.112 mm	3.499	**88.90 mm**	**(8x)**	101.29 mm	2.02 mm	12 mm	175 mm	V652629-X	331.00
.4409	11.200 mm	1.322	**33.60 mm**	**(3x)**	43.30 mm	2.04 mm	12 mm	100 mm	V543531-X	136.00
.4409	11.200 mm	2.204	**56.00 mm**	**(5x)**	66.82 mm	2.04 mm	12 mm	125 mm	V266717-X	158.00
.4409	11.200 mm	3.527	**89.60 mm**	**(8x)**	102.10 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	1.334	**33.90 mm**	**(3x)**	43.68 mm	2.06 mm	12 mm	100 mm	V312875-X	136.00
.4449	11.300 mm	2.224	**56.50 mm**	**(5x)**	67.41 mm	2.06 mm	12 mm	125 mm	V579778-X	158.00
.4449	11.300 mm	3.559	**90.40 mm**	**(8x)**	103.01 mm	2.06 mm	12 mm	175 mm	V774245-X	331.00
.4488	11.400 mm	1.346	**34.20 mm**	**(3x)**	44.07 mm	2.07 mm	12 mm	100 mm	V650650-X	136.00
.4488	11.400 mm	2.244	**57.00 mm**	**(5x)**	68.01 mm	2.07 mm	12 mm	125 mm	V156993-X	158.00
.4488	11.400 mm	3.590	**91.20 mm**	**(8x)**	103.92 mm	2.07 mm	12 mm	175 mm	V872208-X	331.00
.4527	11.500 mm	1.358	**34.50 mm**	**(3x)**	44.45 mm	2.09 mm	12 mm	100 mm	V607294-X	136.00
.4527	11.500 mm	2.263	**57.50 mm**	**(5x)**	68.60 mm	2.09 mm	12 mm	125 mm	V663745-X	158.00
.4527	11.500 mm	3.622	**92.00 mm**	**(8x)**	104.83 mm	2.09 mm	12 mm	175 mm	V212865-X	331.00
.4531 (29/64)	11.508 mm	1.358	**34.50 mm**	**(3x)**	44.49 mm	2.09 mm	12 mm	100 mm	V564439-X	136.00
.4531 (29/64)	11.508 mm	2.265	**57.55 mm**	**(5x)**	68.65 mm	2.09 mm	12 mm	125 mm	V709414-X	158.00
.4531 (29/64)	11.508 mm	3.624	**92.05 mm**	**(8x)**	104.90 mm	2.09 mm	12 mm	175 mm	V208966-X	331.00
.4567	11.600 mm	1.370	**34.80 mm**	**(3x)**	44.84 mm	2.11 mm	12 mm	100 mm	V810836-X	142.50
.4567	11.600 mm	2.283	**58.00 mm**	**(5x)**	69.20 mm	2.11 mm	12 mm	125 mm	V824629-X	164.00
.4567	11.600 mm	3.653	**92.80 mm**	**(8x)**	105.74 mm	2.11 mm	12 mm	175 mm	V358116-X	331.00
.4606	11.700 mm	1.381	**35.10 mm**	**(3x)**	45.23 mm	2.13 mm	12 mm	100 mm	V125838-X	142.50
.4606	11.700 mm	2.303	**58.50 mm**	**(5x)**	69.80 mm	2.13 mm	12 mm	125 mm	V958629-X	164.00
.4606	11.700 mm	3.685	**93.60 mm**	**(8x)**	106.65 mm	2.13 mm	12 mm	175 mm	V540924-X	331.00
.4646	11.800 mm	1.393	**35.40 mm**	**(3x)**	45.61 mm	2.15 mm	12 mm	100 mm	V594549-X	142.50
.4646	11.800 mm	2.322	**59.00 mm**	**(5x)**	70.39 mm	2.15 mm	12 mm	125 mm	V537993-X	164.00
.4646	11.800 mm	3.716	**94.40 mm**	**(8x)**	107.56 mm	2.15 mm	12 mm	175 mm	V956277-X	331.00
.4685	11.900 mm	1.405	**35.70 mm**	**(3x)**	46.00 mm	2.17 mm	12 mm	100 mm	V683774-X	142.50
.4685	11.900 mm	2.342	**59.50 mm**	**(5x)**	70.99 mm	2.17 mm	12 mm	125 mm	V603568-X	164.00
.4685	11.900 mm	3.748	**95.20 mm**	**(8x)**	108.48 mm	2.17 mm	12 mm	175 mm	V902085-X	331.00
.4688 (15/32)	11.907 mm	1.405	**35.70 mm**	**(3x)**	46.03 mm	2.17 mm	12 mm	100 mm	V354466-X	142.50
.4688 (15/32)	11.907 mm	2.344	**59.55 mm**	**(5x)**	71.03 mm	2.17 mm	12 mm	125 mm	V650664-X	164.00
.4688 (15/32)	11.907 mm	3.749	**95.25 mm**	**(8x)**	108.54 mm	2.17 mm	12 mm	175 mm	V230482-X	331.00
.4724	12.000 mm	1.417	**36.00 mm**	**(3x)**	46.39 mm	2.18 mm	14 mm	100 mm	V447728-X	142.50
.4724	12.000 mm	2.362	**60.00 mm**	**(5x)**	71.59 mm	2.18 mm	14 mm	125 mm	V524845-X	164.00
.4724	12.000 mm	3.779	**96.00 mm**	**(8x)**	109.39 mm	2.18 mm	14 mm	175 mm	V955704-X	331.00
.4764	12.100 mm	1.429	**36.30 mm**	**(3x)**	46.77 mm	2.20 mm	14 mm	100 mm	V663610-X	184.00
.4764	12.100 mm	2.381	**60.50 mm**	**(5x)**	72.18 mm	2.20 mm	14 mm	125 mm	V879285-X	214.00
.4764	12.100 mm	3.811	**96.80 mm**	**(8x)**	110.30 mm	2.20 mm	14 mm	175 mm	V329060-X	352.00
.4803	12.200 mm	1.440	**36.60 mm**	**(3x)**	47.16 mm	2.22 mm	14 mm	100 mm	V818824-X	184.00
.4803	12.200 mm	2.401	**61.00 mm**	**(5x)**	72.78 mm	2.22 mm	14 mm	125 mm	V602362-X	214.00
.4803	12.200 mm	3.842	**97.60 mm**	**(8x)**	111.21 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		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
.4843	12.300 mm	1.452	**36.90 mm**	**(3x)**	47.55 mm	2.24 mm	14 mm	100 mm	V771146-X	184.00
.4843	12.300 mm	2.421	**61.50 mm**	**(5x)**	73.38 mm	2.24 mm	14 mm	125 mm	V286389-X	214.00
.4843	12.300 mm	3.874	**98.40 mm**	**(8x)**	112.12 mm	2.24 mm	14 mm	175 mm	V673379-X	352.00
.4882 (31/64)	12.400 mm	1.464	**37.20 mm**	**(3x)**	47.93 mm	2.26 mm	14 mm	100 mm	V790461-X	184.00
.4882 (31/64)	12.400 mm	2.440	**62.00 mm**	**(5x)**	73.97 mm	2.26 mm	14 mm	125 mm	V930755-X	214.00
.4882 (31/64)	12.400 mm	3.905	**99.20 mm**	**(8x)**	113.03 mm	2.26 mm	14 mm	175 mm	V997694-X	352.00
.4921	12.500 mm	1.476	**37.50 mm**	**(3x)**	48.32 mm	2.27 mm	14 mm	100 mm	V202412-X	184.00
.4921	12.500 mm	2.460	**62.50 mm**	**(5x)**	74.57 mm	2.27 mm	14 mm	125 mm	V131343-X	214.00
.4921	12.500 mm	3.937	**100.00 mm**	**(8x)**	113.95 mm	2.27 mm	14 mm	175 mm	V668048-X	352.00
.4961	12.600 mm	1.488	**37.80 mm**	**(3x)**	48.71 mm	2.29 mm	14 mm	100 mm	V369910-X	184.00
.4961	12.600 mm	2.480	**63.00 mm**	**(5x)**	75.17 mm	2.29 mm	14 mm	125 mm	V981463-X	214.00
.4961	12.600 mm	3.968	**100.80 mm**	**(8x)**	114.86 mm	2.29 mm	14 mm	175 mm	V682916-X	352.00
.5000 (1/2)	12.700 mm	1.499	**38.10 mm**	**(3x)**	49.09 mm	2.31 mm	14 mm	100 mm	V608930-X	184.00
.5000 (1/2)	12.700 mm	2.499	**63.50 mm**	**(5x)**	75.76 mm	2.31 mm	14 mm	125 mm	V915134-X	214.00
.5000 (1/2)	12.700 mm	3.999	**101.60 mm**	**(8x)**	115.77 mm	2.31 mm	14 mm	175 mm	V703694-X	352.00

* For h6 and h8 tolerances, see page 8.

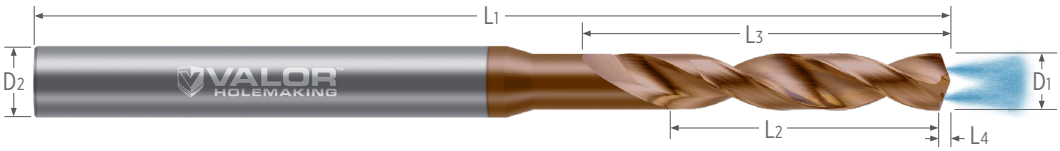
High Performance Drills

For Steels – Coolant-Through

Double margin design for increased stability

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
- Provides excellent performance in Stainless Steels and Cast Iron
- Coolant-through channels further enhance chip evacuation
- 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
- 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
- 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	.312	**7.95 mm**	**(5x)**	9.46 mm	.29 mm	3 mm	63 mm	V189491-X	104.50
.0625 (1/16)	1.587 mm	.499	**12.70 mm**	**(8x)**	14.46 mm	.29 mm	3 mm	63 mm	V709480-X	184.00
.0630	1.600 mm	.314	**8.00 mm**	**(5x)**	9.54 mm	.29 mm	3 mm	63 mm	V231543-X	104.50
.0630	1.600 mm	.503	**12.80 mm**	**(8x)**	14.58 mm	.29 mm	3 mm	63 mm	V886196-X	184.00
.0669	1.700 mm	.334	**8.50 mm**	**(5x)**	10.14 mm	.31 mm	3 mm	63 mm	V282030-X	104.50
.0669	1.700 mm	.535	**13.60 mm**	**(8x)**	15.49 mm	.31 mm	3 mm	63 mm	V538281-X	184.00
.0708	1.800 mm	.354	**9.00 mm**	**(5x)**	10.73 mm	.33 mm	3 mm	63 mm	V148595-X	104.50
.0708	1.800 mm	.566	**14.40 mm**	**(8x)**	16.40 mm	.33 mm	3 mm	63 mm	V604910-X	184.00
.0748	1.900 mm	.374	**9.50 mm**	**(5x)**	11.33 mm	.35 mm	3 mm	63 mm	V525056-X	104.50
.0748	1.900 mm	.598	**15.20 mm**	**(8x)**	17.32 mm	.35 mm	3 mm	63 mm	V766740-X	184.00
.0781 (5/64)	1.984 mm	.389	**9.90 mm**	**(5x)**	11.83 mm	.36 mm	3 mm	63 mm	V622465-X	104.50
.0781 (5/64)	1.984 mm	.624	**15.85 mm**	**(8x)**	18.08 mm	.36 mm	3 mm	63 mm	V830353-X	184.00
.0787	2.000 mm	.393	**10.00 mm**	**(5x)**	11.93 mm	.36 mm	3 mm	63 mm	V995928-X	104.50
.0787	2.000 mm	.629	**16.00 mm**	**(8x)**	18.23 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

For Steels – Coolant-Through (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
.0826	2.100 mm	.413	**10.50 mm**	**(5x)**	12.52 mm	.38 mm	3 mm	63 mm	V507543-X	104.50
.0826	2.100 mm	.661	**16.80 mm**	**(8x)**	19.14 mm	.38 mm	3 mm	63 mm	V870311-X	184.00
.0866	2.200 mm	.433	**11.00 mm**	**(5x)**	13.12 mm	.40 mm	3 mm	63 mm	V344957-X	104.50
.0866	2.200 mm	.692	**17.60 mm**	**(8x)**	20.05 mm	.40 mm	3 mm	63 mm	V324289-X	184.00
.0905	2.300 mm	.452	**11.50 mm**	**(5x)**	13.72 mm	.42 mm	3 mm	63 mm	V869740-X	104.50
.0905	2.300 mm	.724	**18.40 mm**	**(8x)**	20.96 mm	.42 mm	3 mm	63 mm	V742025-X	184.00
.0937 (3/32)	2.381 mm	.468	**11.90 mm**	**(5x)**	14.20 mm	.43 mm	3 mm	63 mm	V941421-X	104.50
.0937 (3/32)	2.381 mm	.749	**19.05 mm**	**(8x)**	21.70 mm	.43 mm	3 mm	63 mm	V250208-X	184.00
.0944	2.400 mm	.472	**12.00 mm**	**(5x)**	14.31 mm	.44 mm	3 mm	63 mm	V307669-X	104.50
.0944	2.400 mm	.755	**19.20 mm**	**(8x)**	21.87 mm	.44 mm	3 mm	63 mm	V518131-X	184.00
.0984	2.500 mm	.492	**12.50 mm**	**(5x)**	14.91 mm	.45 mm	3 mm	63 mm	V539575-X	104.50
.0984	2.500 mm	.787	**20.00 mm**	**(8x)**	22.79 mm	.45 mm	3 mm	63 mm	V411727-X	184.00
.1023	2.600 mm	.511	**13.00 mm**	**(5x)**	15.51 mm	.47 mm	3 mm	63 mm	V216770-X	104.50
.1023	2.600 mm	.818	**20.80 mm**	**(8x)**	23.70 mm	.47 mm	3 mm	63 mm	V895404-X	184.00
.1062	2.700 mm	.531	**13.50 mm**	**(5x)**	16.10 mm	.49 mm	3 mm	63 mm	V324255-X	104.50
.1062	2.700 mm	.850	**21.60 mm**	**(8x)**	24.61 mm	.49 mm	3 mm	63 mm	V455663-X	184.00
.1093 (7/64)	2.778 mm	.547	**13.90 mm**	**(5x)**	16.57 mm	.51 mm	3 mm	63 mm	V247870-X	104.50
.1093 (7/64)	2.778 mm	.874	**22.20 mm**	**(8x)**	25.32 mm	.51 mm	3 mm	63 mm	V484388-X	184.00
.1102	2.800 mm	.551	**14.00 mm**	**(5x)**	16.70 mm	.51 mm	3 mm	63 mm	V406948-X	104.50
.1102	2.800 mm	.881	**22.40 mm**	**(8x)**	25.52 mm	.51 mm	3 mm	63 mm	V580945-X	184.00
.1141	2.900 mm	.570	**14.50 mm**	**(5x)**	17.30 mm	.53 mm	3 mm	63 mm	V401097-X	104.50
.1141	2.900 mm	.913	**23.20 mm**	**(8x)**	26.43 mm	.53 mm	3 mm	63 mm	V463539-X	184.00
.1181	3.000 mm	.590	**15.00 mm**	**(5x)**	17.89 mm	.55 mm	4 mm	63 mm	V801593-X	104.50
.1181	3.000 mm	.944	**24.00 mm**	**(8x)**	27.34 mm	.55 mm	4 mm	75 mm	V457776-X	184.00
.1220	3.100 mm	.610	**15.50 mm**	**(5x)**	18.49 mm	.56 mm	4 mm	63 mm	V364491-X	104.50
.1220	3.100 mm	.976	**24.80 mm**	**(8x)**	28.25 mm	.56 mm	4 mm	75 mm	V220312-X	184.00
.1250 (1/8)	3.175 mm	.625	**15.90 mm**	**(5x)**	18.94 mm	.58 mm	4 mm	63 mm	V809756-X	104.50
.1250 (1/8)	3.175 mm	.999	**25.40 mm**	**(8x)**	28.94 mm	.58 mm	4 mm	75 mm	V996102-X	184.00
.1260	3.200 mm	.629	**16.00 mm**	**(5x)**	19.09 mm	.58 mm	4 mm	63 mm	V416396-X	104.50
.1260	3.200 mm	1.007	**25.60 mm**	**(8x)**	29.17 mm	.58 mm	4 mm	75 mm	V674784-X	184.00
.1300	3.300 mm	.649	**16.50 mm**	**(5x)**	19.68 mm	.60 mm	4 mm	63 mm	V512932-X	104.50
.1300	3.300 mm	1.039	**26.40 mm**	**(8x)**	30.08 mm	.60 mm	4 mm	75 mm	V397319-X	184.00
.1338	3.400 mm	.669	**17.00 mm**	**(5x)**	20.28 mm	.62 mm	4 mm	63 mm	V618699-X	104.50
.1338	3.400 mm	1.070	**27.20 mm**	**(8x)**	30.99 mm	.62 mm	4 mm	75 mm	V677203-X	184.00
.1377	3.500 mm	.688	**17.50 mm**	**(5x)**	20.88 mm	.64 mm	4 mm	63 mm	V270510-X	104.50
.1377	3.500 mm	1.102	**28.00 mm**	**(8x)**	31.90 mm	.64 mm	4 mm	75 mm	V173165-X	184.00

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels – Coolant-Through (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
.1406 (9/64)	3.571 mm	.702	**17.85 mm**	**(5x)**	21.30 mm	.65 mm	4 mm	63 mm	V431644-X	104.50
.1406 (9/64)	3.571 mm	1.124	**28.55 mm**	**(8x)**	32.55 mm	.65 mm	4 mm	75 mm	V576472-X	184.00
.1417	3.600 mm	.708	**18.00 mm**	**(5x)**	21.47 mm	.66 mm	4 mm	63 mm	V818634-X	104.50
.1417	3.600 mm	1.133	**28.80 mm**	**(8x)**	32.81 mm	.66 mm	4 mm	75 mm	V855115-X	184.00
.1456	3.700 mm	.728	**18.50 mm**	**(5x)**	22.07 mm	.67 mm	4 mm	63 mm	V800060-X	104.50
.1456	3.700 mm	1.165	**29.60 mm**	**(8x)**	33.72 mm	.67 mm	4 mm	75 mm	V947623-X	184.00
.1496	3.800 mm	.748	**19.00 mm**	**(5x)**	22.67 mm	.69 mm	4 mm	63 mm	V598062-X	104.50
.1496	3.800 mm	1.196	**30.40 mm**	**(8x)**	34.64 mm	.69 mm	4 mm	75 mm	V264988-X	184.00
.1535	3.900 mm	.767	**19.50 mm**	**(5x)**	23.26 mm	.71 mm	4 mm	63 mm	V853122-X	104.50
.1535	3.900 mm	1.228	**31.20 mm**	**(8x)**	35.55 mm	.71 mm	4 mm	75 mm	V704607-X	184.00
.1562 (5/32)	3.968 mm	.781	**19.85 mm**	**(5x)**	23.67 mm	.72 mm	4 mm	63 mm	V635360-X	104.50
.1562 (5/32)	3.968 mm	1.249	**31.75 mm**	**(8x)**	36.17 mm	.72 mm	4 mm	75 mm	V976984-X	184.00
.1574	4.000 mm	.787	**20.00 mm**	**(5x)**	23.86 mm	.73 mm	6 mm	75 mm	V203097-X	114.00
.1574	4.000 mm	1.259	**32.00 mm**	**(8x)**	36.46 mm	.73 mm	6 mm	100 mm	V976894-X	188.50
.1614	4.100 mm	.807	**20.50 mm**	**(5x)**	24.46 mm	.75 mm	6 mm	75 mm	V123430-X	114.00
.1614	4.100 mm	1.291	**32.80 mm**	**(8x)**	37.37 mm	.75 mm	6 mm	100 mm	V852607-X	188.50
.1653	4.200 mm	.826	**21.00 mm**	**(5x)**	25.05 mm	.76 mm	6 mm	75 mm	V565742-X	114.00
.1653	4.200 mm	1.322	**33.60 mm**	**(8x)**	38.28 mm	.76 mm	6 mm	100 mm	V251176-X	188.50
.1692	4.300 mm	.846	**21.50 mm**	**(5x)**	25.65 mm	.78 mm	6 mm	75 mm	V726600-X	114.00
.1692	4.300 mm	1.354	**34.40 mm**	**(8x)**	39.19 mm	.78 mm	6 mm	100 mm	V898991-X	188.50
.1718 (11/64)	4.365 mm	.860	**21.85 mm**	**(5x)**	26.04 mm	.79 mm	6 mm	75 mm	V599958-X	114.00
.1718 (11/64)	4.365 mm	1.374	**34.90 mm**	**(8x)**	39.79 mm	.79 mm	6 mm	100 mm	V939471-X	188.50
.1732	4.400 mm	.866	**22.00 mm**	**(5x)**	26.25 mm	.80 mm	6 mm	75 mm	V910547-X	114.00
.1732	4.400 mm	1.385	**35.20 mm**	**(8x)**	40.11 mm	.80 mm	6 mm	100 mm	V336021-X	188.50
.1771	4.500 mm	.885	**22.50 mm**	**(5x)**	26.84 mm	.82 mm	6 mm	75 mm	V953328-X	114.00
.1771	4.500 mm	1.417	**36.00 mm**	**(8x)**	41.02 mm	.82 mm	6 mm	100 mm	V645357-X	188.50
.1811	4.600 mm	.905	**23.00 mm**	**(5x)**	27.44 mm	.84 mm	6 mm	75 mm	V522954-X	114.00
.1811	4.600 mm	1.448	**36.80 mm**	**(8x)**	41.93 mm	.84 mm	6 mm	100 mm	V696903-X	188.50
.1850	4.700 mm	.925	**23.50 mm**	**(5x)**	28.04 mm	.86 mm	6 mm	75 mm	V725949-X	114.00
.1850	4.700 mm	1.480	**37.60 mm**	**(8x)**	42.84 mm	.86 mm	6 mm	100 mm	V572954-X	188.50
.1875 (3/16)	4.762 mm	.937	**23.80 mm**	**(5x)**	28.41 mm	.87 mm	6 mm	75 mm	V897179-X	114.00
.1875 (3/16)	4.762 mm	1.499	**38.10 mm**	**(8x)**	43.41 mm	.87 mm	6 mm	100 mm	V900083-X	188.50
.1890	4.800 mm	.944	**24.00 mm**	**(5x)**	28.63 mm	.87 mm	6 mm	75 mm	V787648-X	114.00
.1890	4.800 mm	1.511	**38.40 mm**	**(8x)**	43.75 mm	.87 mm	6 mm	100 mm	V836739-X	188.50
.1930	4.900 mm	.964	**24.50 mm**	**(5x)**	29.23 mm	.89 mm	6 mm	75 mm	V709396-X	114.00
.1930	4.900 mm	1.543	**39.20 mm**	**(8x)**	44.66 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	.984	**25.00 mm**	**(5x)**	29.83 mm	.91 mm	6 mm	75 mm	V676356-X	118.00
.1968	5.000 mm	1.574	**40.00 mm**	**(8x)**	45.58 mm	.91 mm	6 mm	100 mm	V826060-X	188.50
.2007	5.100 mm	1.003	**25.50 mm**	**(5x)**	30.42 mm	.93 mm	6 mm	75 mm	V123829-X	118.00
.2007	5.100 mm	1.606	**40.80 mm**	**(8x)**	46.49 mm	.93 mm	6 mm	100 mm	V775217-X	188.50
.2031 (13/64)	5.159 mm	1.015	**25.80 mm**	**(5x)**	30.77 mm	.94 mm	6 mm	75 mm	V709714-X	118.00
.2031 (13/64)	5.159 mm	1.624	**41.25 mm**	**(8x)**	47.02 mm	.94 mm	6 mm	100 mm	V486375-X	188.50
.2047	5.200 mm	1.023	**26.00 mm**	**(5x)**	31.02 mm	.95 mm	6 mm	75 mm	V284483-X	118.00
.2047	5.200 mm	1.637	**41.60 mm**	**(8x)**	47.40 mm	.95 mm	6 mm	100 mm	V489580-X	188.50
.2086	5.300 mm	1.043	**26.50 mm**	**(5x)**	31.62 mm	.96 mm	6 mm	75 mm	V505303-X	118.00
.2086	5.300 mm	1.669	**42.40 mm**	**(8x)**	48.31 mm	.96 mm	6 mm	100 mm	V397648-X	188.50
.2125	5.400 mm	1.062	**27.00 mm**	**(5x)**	32.21 mm	.98 mm	6 mm	75 mm	V608241-X	118.00
.2125	5.400 mm	1.700	**43.20 mm**	**(8x)**	49.22 mm	.98 mm	6 mm	100 mm	V639671-X	188.50
.2165	5.500 mm	1.082	**27.50 mm**	**(5x)**	32.81 mm	1.00 mm	6 mm	75 mm	V563013-X	118.00
.2165	5.500 mm	1.732	**44.00 mm**	**(8x)**	50.13 mm	1.00 mm	6 mm	100 mm	V967384-X	188.50
.2187 (7/32)	5.556 mm	1.094	**27.80 mm**	**(5x)**	33.14 mm	1.01 mm	6 mm	75 mm	V435943-X	118.00
.2187 (7/32)	5.556 mm	1.749	**44.45 mm**	**(8x)**	50.64 mm	1.01 mm	6 mm	100 mm	V340002-X	188.50
.2205	5.600 mm	1.102	**28.00 mm**	**(5x)**	33.41 mm	1.02 mm	6 mm	75 mm	V687630-X	118.00
.2205	5.600 mm	1.763	**44.80 mm**	**(8x)**	51.05 mm	1.02 mm	6 mm	100 mm	V296219-X	188.50
.2244	5.700 mm	1.122	**28.50 mm**	**(5x)**	34.00 mm	1.04 mm	6 mm	75 mm	V902097-X	118.00
.2244	5.700 mm	1.795	**45.60 mm**	**(8x)**	51.96 mm	1.04 mm	6 mm	100 mm	V190000-X	188.50
.2283	5.800 mm	1.141	**29.00 mm**	**(5x)**	34.60 mm	1.06 mm	6 mm	75 mm	V860180-X	118.00
.2283	5.800 mm	1.826	**46.40 mm**	**(8x)**	52.87 mm	1.06 mm	6 mm	100 mm	V472294-X	188.50
.2322	5.900 mm	1.161	**29.50 mm**	**(5x)**	35.19 mm	1.07 mm	6 mm	75 mm	V506705-X	118.00
.2322	5.900 mm	1.858	**47.20 mm**	**(8x)**	53.78 mm	1.07 mm	6 mm	100 mm	V211763-X	188.50
.2343 (15/64)	5.953 mm	1.171	**29.75 mm**	**(5x)**	35.51 mm	1.08 mm	6 mm	75 mm	V443731-X	118.00
.2343 (15/64)	5.953 mm	1.874	**47.60 mm**	**(8x)**	54.26 mm	1.08 mm	6 mm	100 mm	V301658-X	188.50
.2362	6.000 mm	1.181	**30.00 mm**	**(5x)**	35.79 mm	1.09 mm	8 mm	100 mm	V316316-X	118.00
.2362	6.000 mm	1.889	**48.00 mm**	**(8x)**	54.69 mm	1.09 mm	8 mm	125 mm	V639871-X	188.50
.2401	6.100 mm	1.200	**30.50 mm**	**(5x)**	36.39 mm	1.11 mm	8 mm	100 mm	V912503-X	145.00
.2401	6.100 mm	1.921	**48.80 mm**	**(8x)**	55.60 mm	1.11 mm	8 mm	125 mm	V673335-X	193.00
.2440	6.200 mm	1.220	**31.00 mm**	**(5x)**	36.98 mm	1.13 mm	8 mm	100 mm	V898914-X	145.00
.2440	6.200 mm	1.952	**49.60 mm**	**(8x)**	56.51 mm	1.13 mm	8 mm	125 mm	V252129-X	193.00
.2480	6.300 mm	1.240	**31.50 mm**	**(5x)**	37.58 mm	1.15 mm	8 mm	100 mm	V361266-X	145.00
.2480	6.300 mm	1.984	**50.40 mm**	**(8x)**	57.43 mm	1.15 mm	8 mm	125 mm	V948444-X	193.00
.2500 (1/4)	6.350 mm	1.249	**31.75 mm**	**(5x)**	37.88 mm	1.16 mm	8 mm	100 mm	V596625-X	145.00
.2500 (1/4)	6.350 mm	1.999	**50.80 mm**	**(8x)**	57.88 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 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		
.2520	6.400 mm	1.259	**32.00 mm**	**(5x)**	38.18 mm	1.16 mm	8 mm	100 mm	V745398-X	145.00
.2520	6.400 mm	2.015	**51.20 mm**	**(8x)**	58.34 mm	1.16 mm	8 mm	125 mm	V480804-X	193.00
.2559	6.500 mm	1.279	**32.50 mm**	**(5x)**	38.77 mm	1.18 mm	8 mm	100 mm	V493400-X	145.00
.2559	6.500 mm	2.047	**52.00 mm**	**(8x)**	59.25 mm	1.18 mm	8 mm	125 mm	V486583-X	193.00
.2598	6.600 mm	1.299	**33.00 mm**	**(5x)**	39.37 mm	1.20 mm	8 mm	100 mm	V974827-X	145.00
.2598	6.600 mm	2.078	**52.80 mm**	**(8x)**	60.16 mm	1.20 mm	8 mm	125 mm	V348482-X	215.00
.2638	6.700 mm	1.318	**33.50 mm**	**(5x)**	39.97 mm	1.22 mm	8 mm	100 mm	V533319-X	145.00
.2638	6.700 mm	2.110	**53.60 mm**	**(8x)**	61.07 mm	1.22 mm	8 mm	125 mm	V354955-X	215.00
.2656 (17/64)	6.746 mm	1.328	**33.75 mm**	**(5x)**	40.24 mm	1.23 mm	8 mm	100 mm	V375598-X	145.00
.2656 (17/64)	6.746 mm	2.124	**53.95 mm**	**(8x)**	61.49 mm	1.23 mm	8 mm	125 mm	V286319-X	215.00
.2677	6.800 mm	1.338	**34.00 mm**	**(5x)**	40.56 mm	1.24 mm	8 mm	100 mm	V931711-X	145.00
.2677	6.800 mm	2.141	**54.40 mm**	**(8x)**	61.98 mm	1.24 mm	8 mm	125 mm	V685021-X	215.00
.2717	6.900 mm	1.358	**34.50 mm**	**(5x)**	41.16 mm	1.26 mm	8 mm	100 mm	V903976-X	145.00
.2717	6.900 mm	2.173	**55.20 mm**	**(8x)**	62.90 mm	1.26 mm	8 mm	125 mm	V577100-X	215.00
.2756	7.000 mm	1.377	**35.00 mm**	**(5x)**	41.76 mm	1.27 mm	8 mm	100 mm	V530079-X	145.00
.2756	7.000 mm	2.204	**56.00 mm**	**(8x)**	63.81 mm	1.27 mm	8 mm	125 mm	V914234-X	215.00
.2795	7.100 mm	1.397	**35.50 mm**	**(5x)**	42.35 mm	1.29 mm	8 mm	100 mm	V451380-X	145.00
.2795	7.100 mm	2.236	**56.80 mm**	**(8x)**	64.72 mm	1.29 mm	8 mm	125 mm	V282100-X	215.00
.2812 (9/32)	7.142 mm	1.405	**35.70 mm**	**(5x)**	42.60 mm	1.30 mm	8 mm	100 mm	V583258-X	145.00
.2812 (9/32)	7.142 mm	2.249	**57.15 mm**	**(8x)**	65.10 mm	1.30 mm	8 mm	125 mm	V764606-X	215.00
.2834	7.200 mm	1.417	**36.00 mm**	**(5x)**	42.95 mm	1.31 mm	8 mm	100 mm	V258366-X	145.00
.2834	7.200 mm	2.267	**57.60 mm**	**(8x)**	65.63 mm	1.31 mm	8 mm	125 mm	V215750-X	215.00
.2874	7.300 mm	1.437	**36.50 mm**	**(5x)**	43.55 mm	1.33 mm	8 mm	100 mm	V684490-X	145.00
.2874	7.300 mm	2.299	**58.40 mm**	**(8x)**	66.54 mm	1.33 mm	8 mm	125 mm	V446805-X	215.00
.2913	7.400 mm	1.456	**37.00 mm**	**(5x)**	44.14 mm	1.35 mm	8 mm	100 mm	V391189-X	145.00
.2913	7.400 mm	2.330	**59.20 mm**	**(8x)**	67.45 mm	1.35 mm	8 mm	125 mm	V568456-X	215.00
.2952	7.500 mm	1.476	**37.50 mm**	**(5x)**	44.74 mm	1.36 mm	8 mm	100 mm	V466533-X	145.00
.2952	7.500 mm	2.362	**60.00 mm**	**(8x)**	68.37 mm	1.36 mm	8 mm	125 mm	V899537-X	215.00
.2969 (19/64)	7.541 mm	1.484	**37.70 mm**	**(5x)**	44.99 mm	1.37 mm	8 mm	100 mm	V130050-X	145.00
.2969 (19/64)	7.541 mm	2.375	**60.35 mm**	**(8x)**	68.74 mm	1.37 mm	8 mm	125 mm	V555955-X	215.00
.2992	7.600 mm	1.496	**38.00 mm**	**(5x)**	45.34 mm	1.38 mm	8 mm	100 mm	V446731-X	145.00
.2992	7.600 mm	2.393	**60.80 mm**	**(8x)**	69.28 mm	1.38 mm	8 mm	125 mm	V473739-X	215.00
.3031	7.700 mm	1.515	**38.50 mm**	**(5x)**	45.93 mm	1.40 mm	8 mm	100 mm	V623196-X	145.00
.3031	7.700 mm	2.425	**61.60 mm**	**(8x)**	70.19 mm	1.40 mm	8 mm	125 mm	V597159-X	215.00
.3071	7.800 mm	1.535	**39.00 mm**	**(5x)**	46.53 mm	1.42 mm	8 mm	100 mm	V516266-X	145.00
.3071	7.800 mm	2.456	**62.40 mm**	**(8x)**	71.10 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	1.555	**39.50 mm**	**(5x)**	47.13 mm	1.44 mm	8 mm	100 mm	V880723-X	145.00
.3110	7.900 mm	2.488	**63.20 mm**	**(8x)**	72.01 mm	1.44 mm	8 mm	125 mm	V592896-X	215.00
.3125 (5/16)	7.937 mm	1.562	**39.70 mm**	**(5x)**	47.35 mm	1.44 mm	8 mm	100 mm	V227077-X	145.00
.3125 (5/16)	7.937 mm	2.499	**63.50 mm**	**(8x)**	72.35 mm	1.44 mm	8 mm	125 mm	V284014-X	215.00
.3150	8.000 mm	1.574	**40.00 mm**	**(5x)**	47.72 mm	1.46 mm	10 mm	100 mm	V793102-X	145.00
.3150	8.000 mm	2.519	**64.00 mm**	**(8x)**	72.92 mm	1.46 mm	10 mm	125 mm	V543490-X	215.00
.3189	8.100 mm	1.594	**40.50 mm**	**(5x)**	48.32 mm	1.47 mm	10 mm	100 mm	V794819-X	176.00
.3189	8.100 mm	2.551	**64.80 mm**	**(8x)**	73.84 mm	1.47 mm	10 mm	125 mm	V558544-X	257.50
.3228	8.200 mm	1.614	**41.00 mm**	**(5x)**	48.92 mm	1.49 mm	10 mm	100 mm	V224541-X	176.00
.3228	8.200 mm	2.582	**65.60 mm**	**(8x)**	74.75 mm	1.49 mm	10 mm	125 mm	V791173-X	257.50
.3268	8.300 mm	1.633	**41.50 mm**	**(5x)**	49.51 mm	1.51 mm	10 mm	100 mm	V846287-X	176.00
.3268	8.300 mm	2.614	**66.40 mm**	**(8x)**	75.66 mm	1.51 mm	10 mm	125 mm	V847161-X	257.50
.3281 (21/64)	8.333 mm	1.639	**41.65 mm**	**(5x)**	49.71 mm	1.52 mm	10 mm	100 mm	V132654-X	176.00
.3281 (21/64)	8.333 mm	2.624	**66.65 mm**	**(8x)**	75.96 mm	1.52 mm	10 mm	125 mm	V837883-X	257.50
.3307	8.400 mm	1.653	**42.00 mm**	**(5x)**	50.11 mm	1.53 mm	10 mm	100 mm	V800950-X	176.00
.3307	8.400 mm	2.645	**67.20 mm**	**(8x)**	76.57 mm	1.53 mm	10 mm	125 mm	V429782-X	257.50
.3346	8.500 mm	1.673	**42.50 mm**	**(5x)**	50.71 mm	1.55 mm	10 mm	100 mm	V629626-X	176.00
.3346	8.500 mm	2.677	**68.00 mm**	**(8x)**	77.48 mm	1.55 mm	10 mm	125 mm	V365117-X	257.50
.3386	8.600 mm	1.692	**43.00 mm**	**(5x)**	51.30 mm	1.57 mm	10 mm	100 mm	V934750-X	176.00
.3386	8.600 mm	2.708	**68.80 mm**	**(8x)**	78.39 mm	1.57 mm	10 mm	125 mm	V672857-X	257.50
.3425	8.700 mm	1.712	**43.50 mm**	**(5x)**	51.90 mm	1.58 mm	10 mm	100 mm	V535214-X	176.00
.3425	8.700 mm	2.740	**69.60 mm**	**(8x)**	79.30 mm	1.58 mm	10 mm	125 mm	V724736-X	257.50
.3438 (11/32)	8.732 mm	1.718	**43.65 mm**	**(5x)**	52.09 mm	1.59 mm	10 mm	100 mm	V188406-X	176.00
.3438 (11/32)	8.732 mm	2.749	**69.85 mm**	**(8x)**	79.60 mm	1.59 mm	10 mm	125 mm	V365910-X	257.50
.3465	8.800 mm	1.732	**44.00 mm**	**(5x)**	52.50 mm	1.60 mm	10 mm	100 mm	V293144-X	176.00
.3465	8.800 mm	2.771	**70.40 mm**	**(8x)**	80.22 mm	1.60 mm	10 mm	125 mm	V817884-X	257.50
.3504	8.900 mm	1.751	**44.50 mm**	**(5x)**	53.09 mm	1.62 mm	10 mm	100 mm	V818572-X	176.00
.3504	8.900 mm	2.803	**71.20 mm**	**(8x)**	81.13 mm	1.62 mm	10 mm	150 mm	V648679-X	257.50
.3543	9.000 mm	1.771	**45.00 mm**	**(5x)**	53.69 mm	1.64 mm	10 mm	100 mm	V936127-X	176.00
.3543	9.000 mm	2.834	**72.00 mm**	**(8x)**	82.04 mm	1.64 mm	10 mm	150 mm	V150387-X	257.50
.3583	9.100 mm	1.791	**45.50 mm**	**(5x)**	54.29 mm	1.66 mm	10 mm	100 mm	V347102-X	176.00
.3583	9.100 mm	2.866	**72.80 mm**	**(8x)**	82.95 mm	1.66 mm	10 mm	150 mm	V201118-X	257.50
.3594 (23/64)	9.128 mm	1.797	**45.65 mm**	**(5x)**	54.45 mm	1.66 mm	10 mm	100 mm	V859797-X	176.00
.3594 (23/64)	9.128 mm	2.874	**73.00 mm**	**(8x)**	83.21 mm	1.66 mm	10 mm	150 mm	V984555-X	257.50
.3622	9.200 mm	1.811	**46.00 mm**	**(5x)**	54.88 mm	1.67 mm	10 mm	100 mm	V317969-X	176.00
.3622	9.200 mm	2.897	**73.60 mm**	**(8x)**	83.86 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	1.830	**46.50 mm**	**(5x)**	55.48 mm	1.69 mm	10 mm	100 mm	V400752-X	176.00
.3661	9.300 mm	2.929	**74.40 mm**	**(8x)**	84.77 mm	1.69 mm	10 mm	150 mm	V105289-X	257.50
.3701	9.400 mm	1.850	**47.00 mm**	**(5x)**	56.08 mm	1.71 mm	10 mm	100 mm	V220320-X	176.00
.3701	9.400 mm	2.960	**75.20 mm**	**(8x)**	85.69 mm	1.71 mm	10 mm	150 mm	V421207-X	257.50
.3740	9.500 mm	1.870	**47.50 mm**	**(5x)**	56.67 mm	1.73 mm	10 mm	100 mm	V614370-X	176.00
.3740	9.500 mm	2.992	**76.00 mm**	**(8x)**	86.60 mm	1.73 mm	10 mm	150 mm	V888115-X	257.50
.3750 (3/8)	9.525 mm	1.875	**47.65 mm**	**(5x)**	56.82 mm	1.73 mm	10 mm	100 mm	V527488-X	176.00
.3750 (3/8)	9.525 mm	2.999	**76.20 mm**	**(8x)**	86.83 mm	1.73 mm	10 mm	150 mm	V571908-X	257.50
.3780	9.600 mm	1.889	**48.00 mm**	**(5x)**	57.27 mm	1.75 mm	10 mm	100 mm	V602463-X	189.00
.3780	9.600 mm	3.023	**76.80 mm**	**(8x)**	87.51 mm	1.75 mm	10 mm	150 mm	V778318-X	257.50
.3819	9.700 mm	1.909	**48.50 mm**	**(5x)**	57.87 mm	1.77 mm	10 mm	100 mm	V504675-X	189.00
.3819	9.700 mm	3.055	**77.60 mm**	**(8x)**	88.42 mm	1.77 mm	10 mm	150 mm	V739150-X	257.50
.3858	9.800 mm	1.929	**49.00 mm**	**(5x)**	58.46 mm	1.78 mm	10 mm	100 mm	V803165-X	189.00
.3858	9.800 mm	3.086	**78.40 mm**	**(8x)**	89.33 mm	1.78 mm	10 mm	150 mm	V526907-X	257.50
.3898	9.900 mm	1.948	**49.50 mm**	**(5x)**	59.06 mm	1.80 mm	10 mm	100 mm	V162974-X	189.00
.3898	9.900 mm	3.118	**79.20 mm**	**(8x)**	90.24 mm	1.80 mm	10 mm	150 mm	V265965-X	257.50
.3906 (25/64)	9.921 mm	1.952	**49.60 mm**	**(5x)**	59.18 mm	1.81 mm	10 mm	100 mm	V955537-X	189.00
.3906 (25/64)	9.921 mm	3.124	**79.35 mm**	**(8x)**	90.44 mm	1.81 mm	10 mm	150 mm	V598968-X	257.50
.3937	10.000 mm	1.968	**50.00 mm**	**(5x)**	59.66 mm	1.82 mm	12 mm	125 mm	V666168-X	189.00
.3937	10.000 mm	3.149	**80.00 mm**	**(8x)**	91.16 mm	1.82 mm	12 mm	150 mm	V703861-X	257.50
.3976	10.100 mm	1.988	**50.50 mm**	**(5x)**	60.25 mm	1.84 mm	12 mm	125 mm	V556342-X	243.50
.3976	10.100 mm	3.181	**80.80 mm**	**(8x)**	92.07 mm	1.84 mm	12 mm	150 mm	V268015-X	344.50
.4016	10.200 mm	2.007	**51.00 mm**	**(5x)**	60.85 mm	1.86 mm	12 mm	125 mm	V239429-X	243.50
.4016	10.200 mm	3.212	**81.60 mm**	**(8x)**	92.98 mm	1.86 mm	12 mm	150 mm	V358630-X	344.50
.4055	10.300 mm	2.027	**51.50 mm**	**(5x)**	61.45 mm	1.87 mm	12 mm	125 mm	V795138-X	243.50
.4055	10.300 mm	3.244	**82.40 mm**	**(8x)**	93.89 mm	1.87 mm	12 mm	150 mm	V932200-X	344.50
.4062 (13/32)	10.317 mm	2.031	**51.60 mm**	**(5x)**	61.55 mm	1.88 mm	12 mm	125 mm	V193040-X	243.50
.4062 (13/32)	10.317 mm	3.249	**82.55 mm**	**(8x)**	94.05 mm	1.88 mm	12 mm	150 mm	V880263-X	344.50
.4094	10.400 mm	2.047	**52.00 mm**	**(5x)**	62.04 mm	1.89 mm	12 mm	125 mm	V455264-X	243.50
.4094	10.400 mm	3.275	**83.20 mm**	**(8x)**	94.80 mm	1.89 mm	12 mm	150 mm	V403117-X	344.50
.4134	10.500 mm	2.066	**52.50 mm**	**(5x)**	62.64 mm	1.91 mm	12 mm	125 mm	V720867-X	243.50
.4134	10.500 mm	3.307	**84.00 mm**	**(8x)**	95.71 mm	1.91 mm	12 mm	150 mm	V789723-X	344.50
.4173	10.600 mm	2.086	**53.00 mm**	**(5x)**	63.24 mm	1.93 mm	12 mm	125 mm	V799193-X	243.50
.4173	10.600 mm	3.338	**84.80 mm**	**(8x)**	96.63 mm	1.93 mm	12 mm	150 mm	V713139-X	344.50
.4213	10.700 mm	2.106	**53.50 mm**	**(5x)**	63.83 mm	1.95 mm	12 mm	125 mm	V146857-X	243.50
.4213	10.700 mm	3.370	**85.60 mm**	**(8x)**	97.54 mm	1.95 mm	12 mm	150 mm	V786898-X	344.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

For Steels – Coolant-Through (cont.)

continued from previous page

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	2.110	**53.60 mm**	**(5x)**	63.93 mm	1.95 mm	12 mm	125 mm	V399606-X	243.50
.4219 (27/64)	10.716 mm	3.375	**85.75 mm**	**(8x)**	97.68 mm	1.95 mm	12 mm	150 mm	V248975-X	344.50
.4252	10.800 mm	2.125	**54.00 mm**	**(5x)**	64.43 mm	1.97 mm	12 mm	125 mm	V422061-X	243.50
.4252	10.800 mm	3.401	**86.40 mm**	**(8x)**	98.45 mm	1.97 mm	12 mm	150 mm	V195955-X	344.50
.4291	10.900 mm	2.145	**54.50 mm**	**(5x)**	65.03 mm	1.98 mm	12 mm	125 mm	V540329-X	243.50
.4291	10.900 mm	3.433	**87.20 mm**	**(8x)**	99.36 mm	1.98 mm	12 mm	175 mm	V876962-X	344.50
.4331	11.000 mm	2.165	**55.00 mm**	**(5x)**	65.62 mm	2.00 mm	12 mm	125 mm	V343592-X	243.50
.4331	11.000 mm	3.464	**88.00 mm**	**(8x)**	100.27 mm	2.00 mm	12 mm	175 mm	V899093-X	344.50
.4370	11.100 mm	2.185	**55.50 mm**	**(5x)**	66.22 mm	2.02 mm	12 mm	125 mm	V352322-X	243.50
.4370	11.100 mm	3.496	**88.80 mm**	**(8x)**	101.18 mm	2.02 mm	12 mm	175 mm	V760218-X	344.50
.4375 (7/16)	11.112 mm	2.187	**55.55 mm**	**(5x)**	66.29 mm	2.02 mm	12 mm	125 mm	V845356-X	243.50
.4375 (7/16)	11.112 mm	3.499	**88.90 mm**	**(8x)**	101.29 mm	2.02 mm	12 mm	175 mm	V439028-X	344.50
.4409	11.200 mm	2.204	**56.00 mm**	**(5x)**	66.82 mm	2.04 mm	12 mm	125 mm	V543395-X	243.50
.4409	11.200 mm	3.527	**89.60 mm**	**(8x)**	102.10 mm	2.04 mm	12 mm	175 mm	V275937-X	344.50
.4449	11.300 mm	2.224	**56.50 mm**	**(5x)**	67.41 mm	2.06 mm	12 mm	125 mm	V274775-X	243.50
.4449	11.300 mm	3.559	**90.40 mm**	**(8x)**	103.01 mm	2.06 mm	12 mm	175 mm	V718898-X	344.50
.4488	11.400 mm	2.244	**57.00 mm**	**(5x)**	68.01 mm	2.07 mm	12 mm	125 mm	V212694-X	243.50
.4488	11.400 mm	3.590	**91.20 mm**	**(8x)**	103.92 mm	2.07 mm	12 mm	175 mm	V700150-X	344.50
.4527	11.500 mm	2.263	**57.50 mm**	**(5x)**	68.60 mm	2.09 mm	12 mm	125 mm	V711465-X	243.50
.4527	11.500 mm	3.622	**92.00 mm**	**(8x)**	104.83 mm	2.09 mm	12 mm	175 mm	V356032-X	344.50
.4531 (29/64)	11.508 mm	2.265	**57.55 mm**	**(5x)**	68.65 mm	2.09 mm	12 mm	125 mm	V353391-X	243.50
.4531 (29/64)	11.508 mm	3.624	**92.05 mm**	**(8x)**	104.90 mm	2.09 mm	12 mm	175 mm	V409601-X	344.50
.4567	11.600 mm	2.283	**58.00 mm**	**(5x)**	69.20 mm	2.11 mm	12 mm	125 mm	V646698-X	243.50
.4567	11.600 mm	3.653	**92.80 mm**	**(8x)**	105.74 mm	2.11 mm	12 mm	175 mm	V865206-X	344.50
.4606	11.700 mm	2.303	**58.50 mm**	**(5x)**	69.80 mm	2.13 mm	12 mm	125 mm	V847917-X	243.50
.4606	11.700 mm	3.685	**93.60 mm**	**(8x)**	106.65 mm	2.13 mm	12 mm	175 mm	V559316-X	344.50
.4646	11.800 mm	2.322	**59.00 mm**	**(5x)**	70.39 mm	2.15 mm	12 mm	125 mm	V925309-X	243.50
.4646	11.800 mm	3.716	**94.40 mm**	**(8x)**	107.56 mm	2.15 mm	12 mm	175 mm	V336564-X	344.50
.4685	11.900 mm	2.342	**59.50 mm**	**(5x)**	70.99 mm	2.17 mm	12 mm	125 mm	V168544-X	243.50
.4685	11.900 mm	3.748	**95.20 mm**	**(8x)**	108.48 mm	2.17 mm	12 mm	175 mm	V985664-X	344.50
.4688 (15/32)	11.907 mm	2.344	**59.55 mm**	**(5x)**	71.03 mm	2.17 mm	12 mm	125 mm	V798383-X	243.50
.4688 (15/32)	11.907 mm	3.749	**95.25 mm**	**(8x)**	108.54 mm	2.17 mm	12 mm	175 mm	V603519-X	344.50
.4724	12.000 mm	2.362	**60.00 mm**	**(5x)**	71.59 mm	2.18 mm	14 mm	125 mm	V282193-X	243.50
.4724	12.000 mm	3.779	**96.00 mm**	**(8x)**	109.39 mm	2.18 mm	14 mm	175 mm	V588339-X	344.50

* For h6 and h8 tolerances, see page 8.

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High Performance Drills

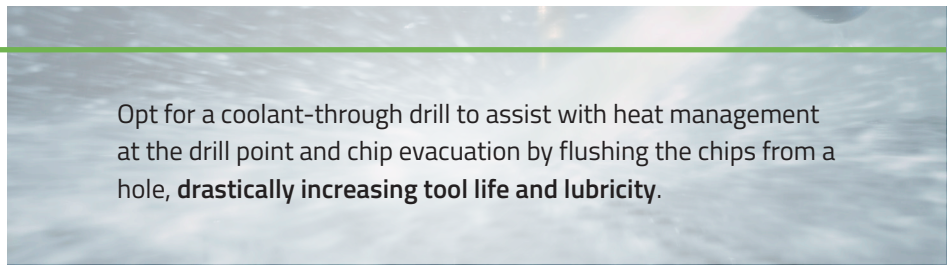
For Steels – Coolant-Through (cont.)

continued from previous page

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	2.381	**60.50 mm**	**(5x)**	72.18 mm	2.20 mm	14 mm	125 mm	V165416-X	321.00
.4764	12.100 mm	3.811	**96.80 mm**	**(8x)**	110.30 mm	2.20 mm	14 mm	175 mm	V611187-X	353.00
.4803	12.200 mm	2.401	**61.00 mm**	**(5x)**	72.78 mm	2.22 mm	14 mm	125 mm	V499243-X	321.00
.4803	12.200 mm	3.842	**97.60 mm**	**(8x)**	111.21 mm	2.22 mm	14 mm	175 mm	V556731-X	353.00
.4843	12.300 mm	2.421	**61.50 mm**	**(5x)**	73.38 mm	2.24 mm	14 mm	125 mm	V606643-X	321.00
.4843	12.300 mm	3.874	**98.40 mm**	**(8x)**	112.12 mm	2.24 mm	14 mm	175 mm	V449949-X	353.00
.4882 (31/64)	12.400 mm	2.440	**62.00 mm**	**(5x)**	73.97 mm	2.26 mm	14 mm	125 mm	V619843-X	321.00
.4882 (31/64)	12.400 mm	3.905	**99.20 mm**	**(8x)**	113.03 mm	2.26 mm	14 mm	175 mm	V558340-X	353.00
.4921	12.500 mm	2.460	**62.50 mm**	**(5x)**	74.57 mm	2.27 mm	14 mm	125 mm	V436056-X	321.00
.4921	12.500 mm	3.937	**100.00 mm**	**(8x)**	113.95 mm	2.27 mm	14 mm	175 mm	V744710-X	353.00
.4961	12.600 mm	2.480	**63.00 mm**	**(5x)**	75.17 mm	2.29 mm	14 mm	125 mm	V509952-X	321.00
.4961	12.600 mm	3.968	**100.80 mm**	**(8x)**	114.86 mm	2.29 mm	14 mm	175 mm	V520602-X	353.00
.5000 (1/2)	12.700 mm	2.499	**63.50 mm**	**(5x)**	75.76 mm	2.31 mm	14 mm	125 mm	V838117-X	321.00
.5000 (1/2)	12.700 mm	3.999	**101.60 mm**	**(8x)**	115.77 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

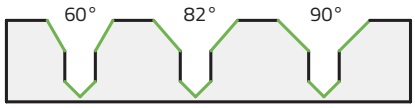
Val-Max X coated for superior performance

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

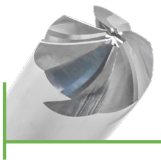
Included Angle	Size	Drill Diameter	Drill Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
A $^{+1°}_{-1°}$		$D_1{}^{+.0015''}_{+.0005''}$	$L_2{}^{+.005''}_{-.000''}$	D_2	L_1	Tool #	Price	Tool #	Price
60°	000	.020	.020	1/8	1-1/2	V556663	30.60	V556663-X	37.40
	00	.025	.025	1/8	1-1/2	V185274	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

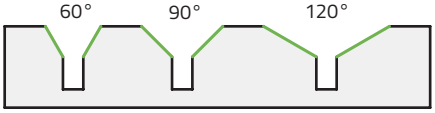
- Optimized for countersinking and chamfering operations while providing excellent performance in deburring applications
- Free cutting action design provides excellent surface finish and chip evacuation
- Engineered with a specialized helical flute design for superior performance
- Offered in Type I 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

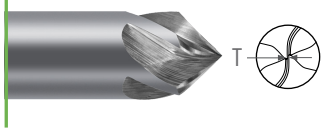
*Tolerance for Type I is +.000"/-.005". Tolerance for Type II is +.002"/-.002"

continued on next page

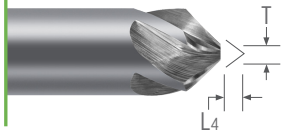
Stocked in three included angles



Type I: Pointed



Type II: Flat End (non-cutting)



High Performance Chamfer Cutters

Helically Fluted (cont.)

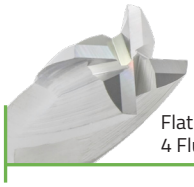
continued from previous page

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

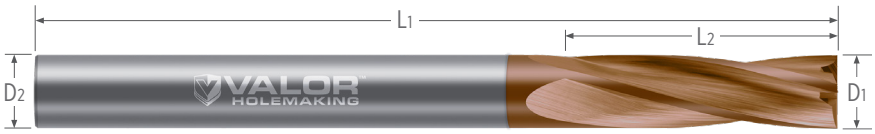
Flat Bottom



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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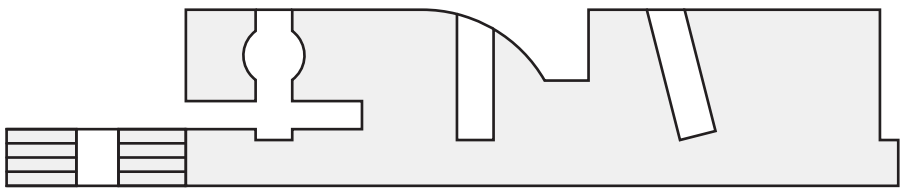
Flat Bottom Counterbore Applications



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

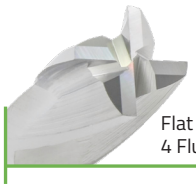
*Tolerance refers to uncoated counterbores. Tolerance for Val-Max X coated counterbores is +.0002"/-.0005".

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

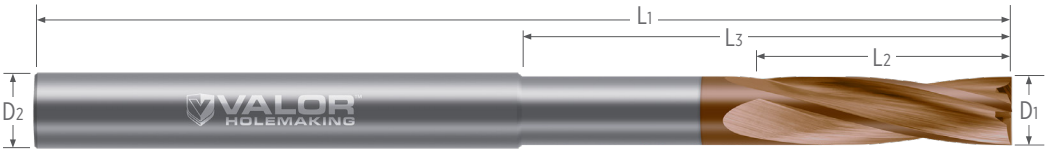
Flat Bottom – Long Reach



Flat Bottom
4 Flute Design

Unmatched Precision in Long Reach Counterboring Applications

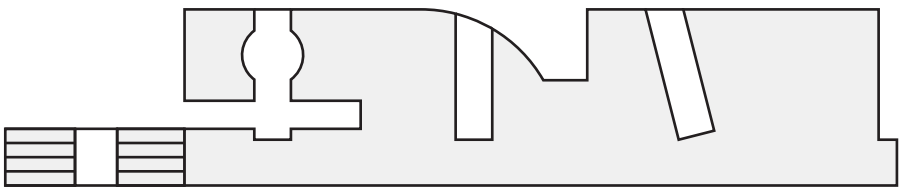
- Engineered with an undersized neck to avoid heeling
- Flat bottom design (no dish) allows for spot facing or counterboring on irregular surfaces commonly found on rounded or complex parts
- Provides excellent performance when flat bottom reaming or straightening misaligned holes
- Ground with full 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

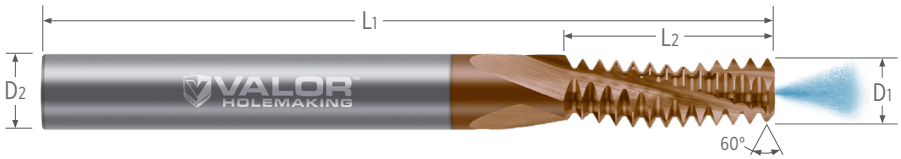
Thread Mills

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.

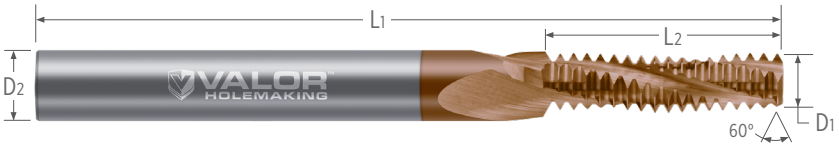
Thread Mills

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

Access Simulation Files in .STEP Format for Every Valor Holemaking Tool

valorholemaking.com/resources/simulation-files

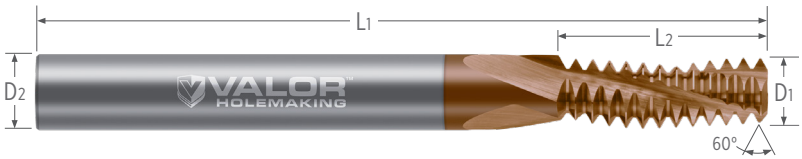
Thread Mills

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.

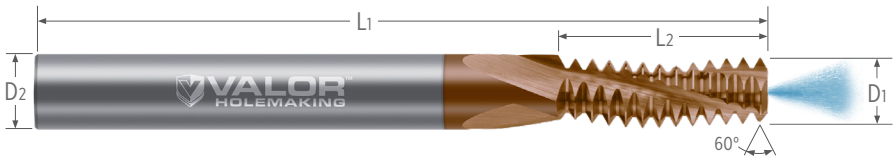
Thread Mills

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

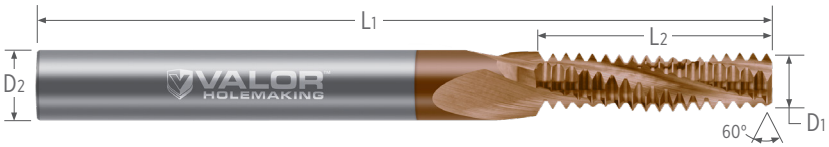
Thread Mills

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

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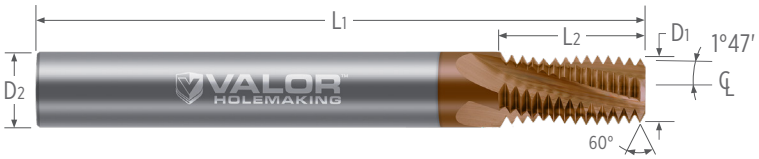
Thread Mills

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

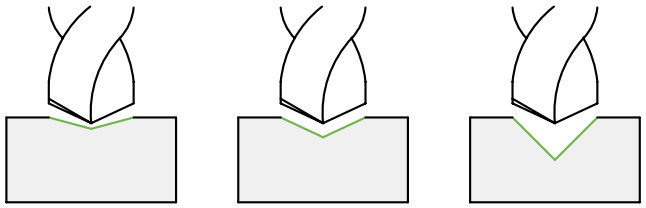
Properly Select a Valor Holemaking High Performance Spotting Drill

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.



Proper Spot Angle | Acceptable Spot Angle | Improper Spot Angle

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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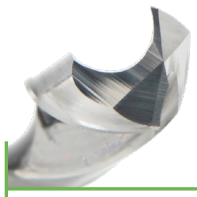

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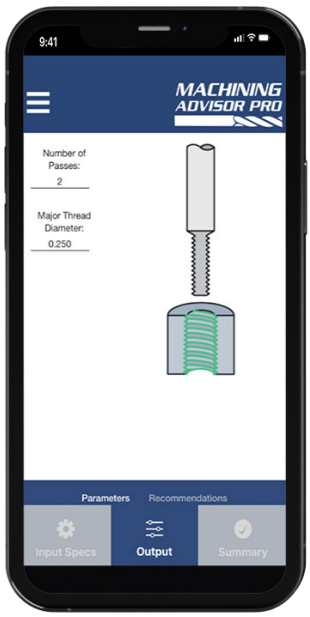

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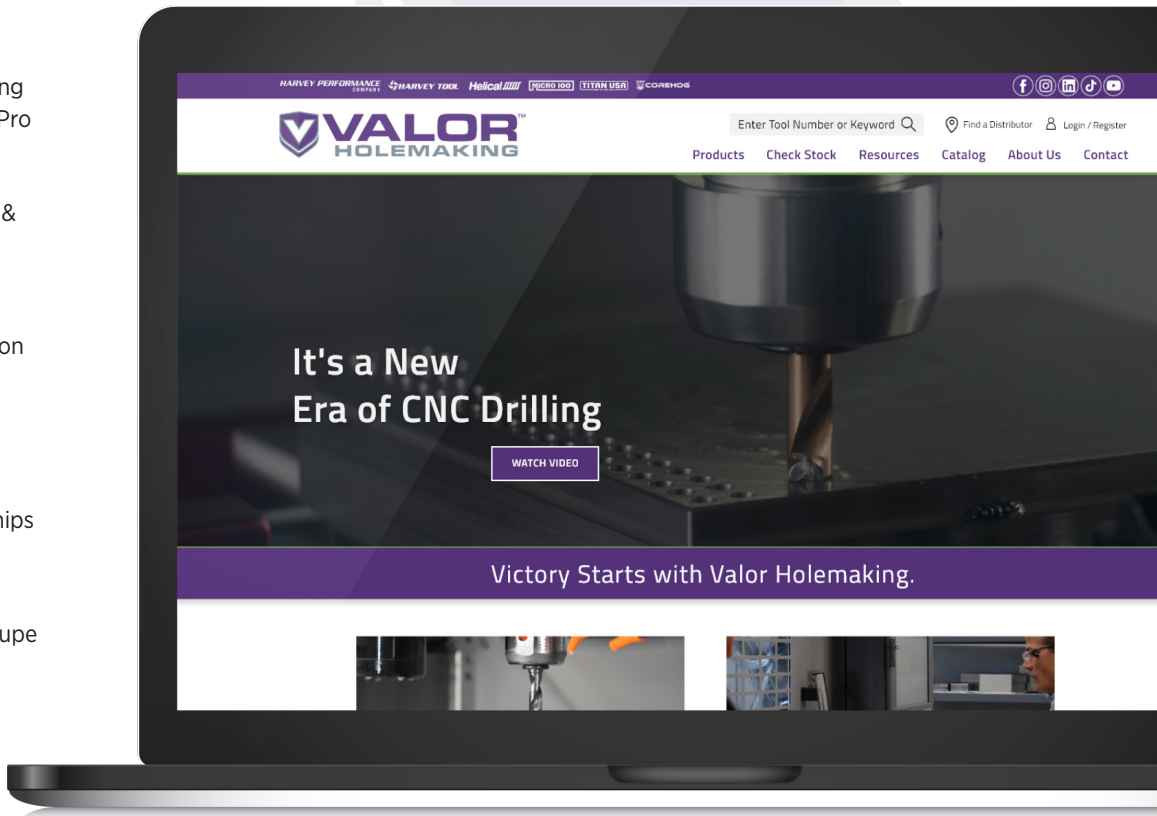

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