



# VALOR™ HOLEMAKING

Victory Starts With Valor Holemaking

PREMIERING  
**2023**  
PRODUCT  
CATALOG

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



### Think Harvey Tool First

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



### Let Helical Impress You

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



### Make More with Micro 100

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



### Trust in Titan USA

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



### Innovative Tools for Innovative Materials

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



### Victory Starts with Valor Holemaking

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





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

**Superior Hole Quality & Performance**

**Reduced Cost-Per-Hole**

**Reliable, Fully Stocked Inventory**

**Engineered & Manufactured in the USA.**

## OUR OFFERING

**11** High Performance Spotting Drills



**13** High Performance Drills for Aluminum & Aluminum Alloys



**32** High Performance Drills for Steels



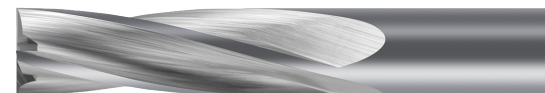
**55** Combined Drill & Countersinks



**56** High Performance Chamfer Cutters



**58** Counterbores



**61** Thread Mills



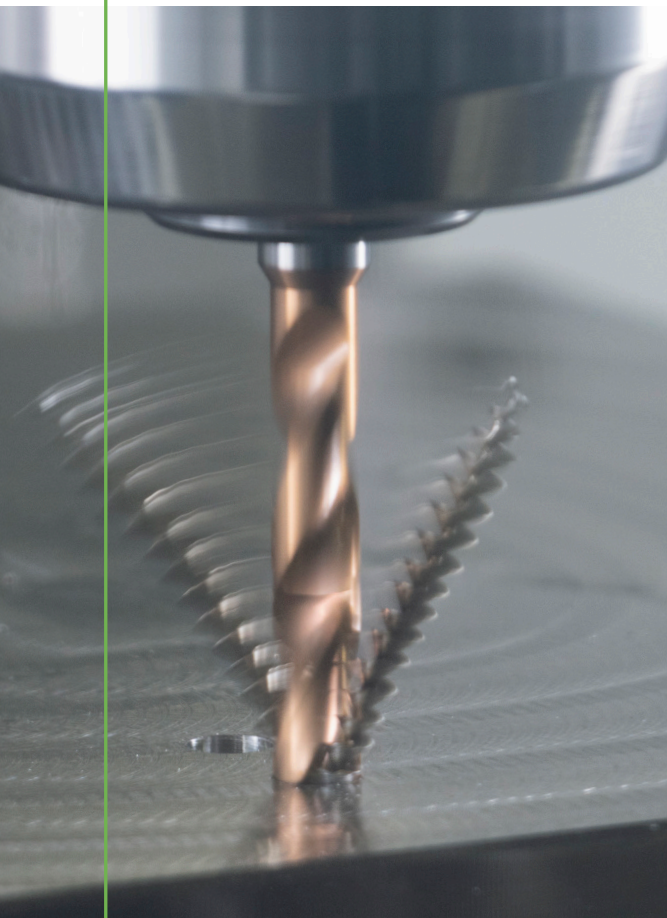
**Victory Starts With  
Valor Holemaking**





## 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.





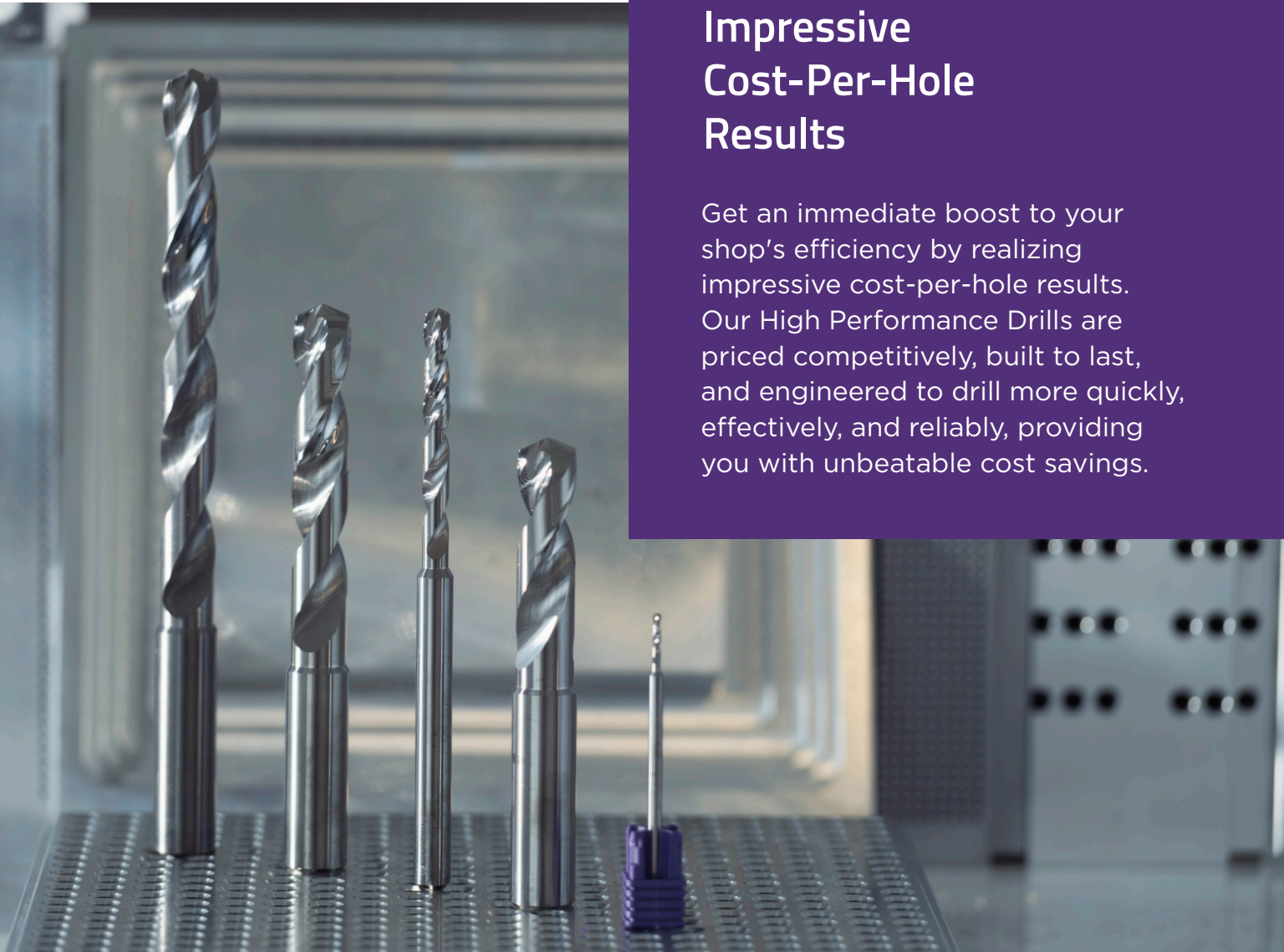
## Amazing Tool Life & Performance

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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High Performance Drills for Aluminum & Aluminum Alloys  
Coolant-Through

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## COUNTERBORING



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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
		
<b>Application Benefits</b>	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.
<b>Materials</b>	Wrought Aluminum, Cast Aluminum, and Non-Ferrous Materials	Alloy Steels, Stainless Steels, Hardened Steels, Cast Iron, and Nickel Alloys
<b>Coating Appearance</b>	Light Gold / Champagne	Copper
<b>Max Temperature Usage</b>	1,110° F	2,192° F
<b>Microhardness (HV 0.05)</b>	2243 (22 GPa)	4487 (44 GPa)
<b>Coefficient of Friction</b>	0.40	0.35

## Tolerance Chart

High Performance Drills & Spotting Drills

Diameter (mm)	Drill Diameter D1 (h8)		Shank Diameter D2 (h6)	
	inch	microns	inch	microns
<b>0 mm - 3 mm</b>	+0" / -.0006"	+0 μm / -14 μm	+0" / -.0002"	+0 μm / -6 μm
<b>3 mm - 6 mm</b>	+0" / -.0007"	+0 μm / -18 μm	+0" / -.0003"	+0 μm / -8 μm
<b>6 mm - 10 mm</b>	+0" / -.0009"	+0 μm / -22 μm	+0" / -.0004"	+0 μm / -9 μm
<b>10 mm - 18 mm</b>	+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

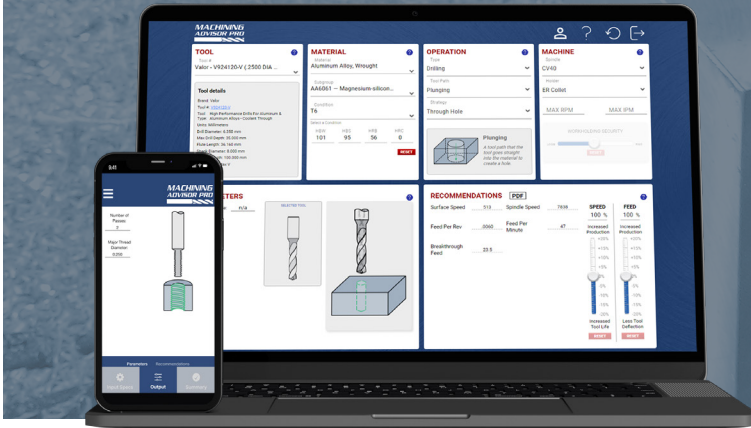


[machiningadvisorpro.com](http://machiningadvisorpro.com)



## MACHINING ADVISOR PRO

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





# Build & Send Shopping Carts to Your Distributor at [valorholemaking.com](http://valorholemaking.com)

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.



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.



Machining Advisor Pro



Speeds & Feeds



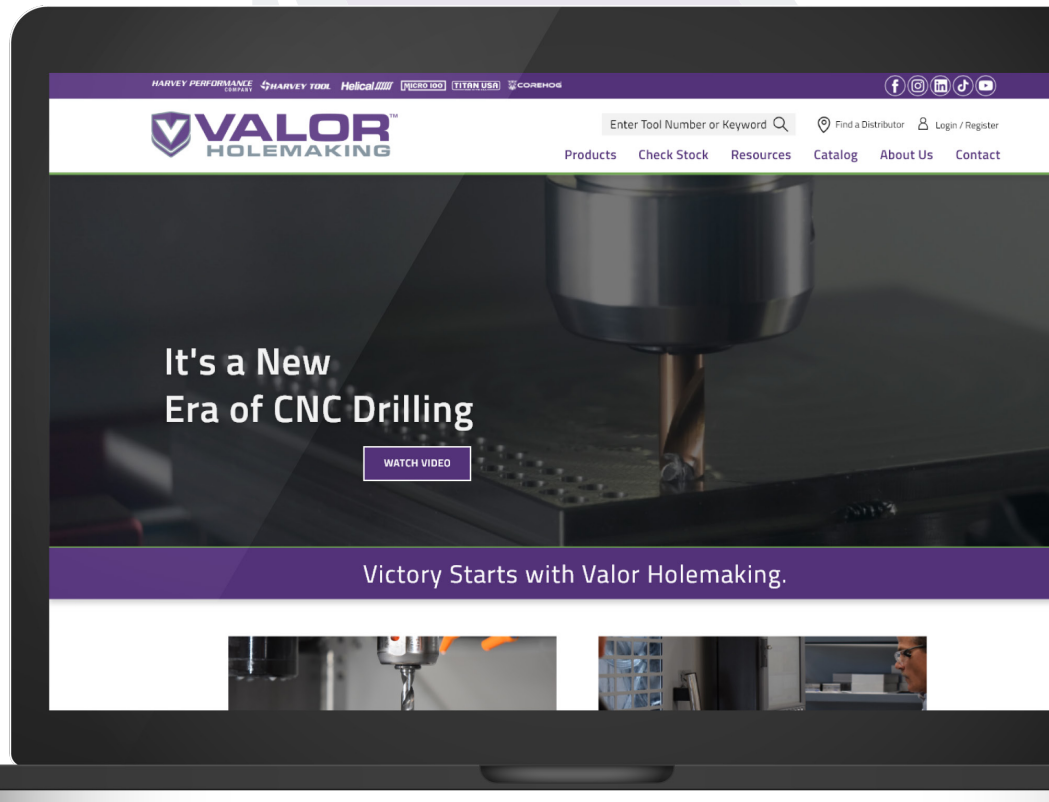
Simulation Files



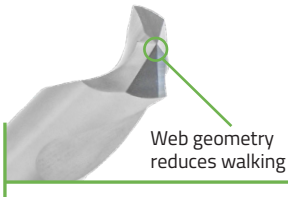
CAM Partnerships



In The Loupe Blog







# High Performance Spotting Drills

## Delivers Incredible Accuracy for High Performance Drilling

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



Excellent for aluminum and non-ferrous alloys

Outstanding in ferrous materials

Point Angle	Drill Diameter		Flute Length (inclusive of point angle)		Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max X Coated	
	inch	metric	inch	metric				Tool #	Price	Tool #	Price
90°	D1 (h8)*		L2		L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
	.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

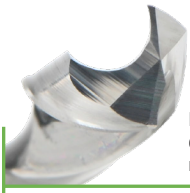
Material Guide		Hardness	SFM	Chip Load (IPR) by Drill Diameter						
				1/8	3/16	1/4	3/8	1/2	5/8	3/4
Carbon Steels	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	29-37 Rc (279-344 HBn)	150	.00270	.00404	.00540	.00810	.01080	.01350	.01620
Low Alloy Steels	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	29-37 Rc (279-344 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							
	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 Holesmaking 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](mailto:Valortech@harveyperformance.com).





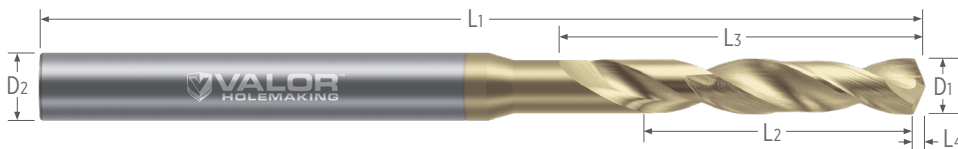
Point geometry designed to minimize burrs

# 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-flute 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

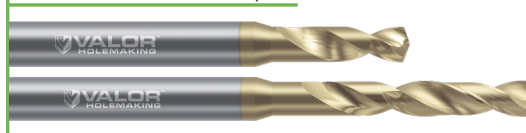


Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth					Tool #	Price	Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1				
.0625 (1/16)	1.587 mm	.187	4.75 mm	(3x)	6.17 mm	.33 mm	3 mm	63 mm	V194685	43.50	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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.1406 (9/64)	3.571 mm	.421	<b>10.70 mm</b>	<b>(3x)</b>	13.89 mm	.74 mm	4 mm	63 mm	<b>V740344</b>	43.50	<b>V740344-V</b>	50.00
.1406 (9/64)	3.571 mm	.702	<b>17.85 mm</b>	<b>(5x)</b>	21.39 mm	.74 mm	4 mm	63 mm	<b>V747490</b>	80.00	<b>V747490-V</b>	86.50
.1417	3.600 mm	.425	<b>10.80 mm</b>	<b>(3x)</b>	14.01 mm	.75 mm	4 mm	63 mm	<b>V137136</b>	43.50	<b>V137136-V</b>	50.00
.1417	3.600 mm	.708	<b>18.00 mm</b>	<b>(5x)</b>	21.57 mm	.75 mm	4 mm	63 mm	<b>V813201</b>	80.00	<b>V813201-V</b>	86.50
.1456	3.700 mm	.437	<b>11.10 mm</b>	<b>(3x)</b>	14.40 mm	.77 mm	4 mm	63 mm	<b>V282861</b>	43.50	<b>V282861-V</b>	50.00
.1456	3.700 mm	.728	<b>18.50 mm</b>	<b>(5x)</b>	22.17 mm	.77 mm	4 mm	63 mm	<b>V334748</b>	80.00	<b>V334748-V</b>	86.50
.1496	3.800 mm	.448	<b>11.40 mm</b>	<b>(3x)</b>	14.79 mm	.79 mm	4 mm	63 mm	<b>V728547</b>	43.50	<b>V728547-V</b>	50.00
.1496	3.800 mm	.748	<b>19.00 mm</b>	<b>(5x)</b>	22.77 mm	.79 mm	4 mm	63 mm	<b>V454017</b>	80.00	<b>V454017-V</b>	86.50
.1535	3.900 mm	.460	<b>11.70 mm</b>	<b>(3x)</b>	15.18 mm	.81 mm	4 mm	63 mm	<b>V438470</b>	43.50	<b>V438470-V</b>	50.00
.1535	3.900 mm	.767	<b>19.50 mm</b>	<b>(5x)</b>	23.37 mm	.81 mm	4 mm	63 mm	<b>V878966</b>	80.00	<b>V878966-V</b>	86.50
.1562 (5/32)	3.968 mm	.468	<b>11.90 mm</b>	<b>(3x)</b>	15.44 mm	.82 mm	4 mm	63 mm	<b>V648893</b>	43.50	<b>V648893-V</b>	50.00
.1562 (5/32)	3.968 mm	.781	<b>19.85 mm</b>	<b>(5x)</b>	23.77 mm	.82 mm	4 mm	63 mm	<b>V458952</b>	80.00	<b>V458952-V</b>	86.50
.1574	4.000 mm	.472	<b>12.00 mm</b>	<b>(3x)</b>	15.56 mm	.83 mm	6 mm	63 mm	<b>V421509</b>	43.50	<b>V421509-V</b>	51.00
.1574	4.000 mm	.787	<b>20.00 mm</b>	<b>(5x)</b>	23.96 mm	.83 mm	6 mm	75 mm	<b>V338334</b>	80.00	<b>V338334-V</b>	87.50
.1614	4.100 mm	.484	<b>12.30 mm</b>	<b>(3x)</b>	15.95 mm	.85 mm	6 mm	63 mm	<b>V174492</b>	50.50	<b>V174492-V</b>	58.00
.1614	4.100 mm	.807	<b>20.50 mm</b>	<b>(5x)</b>	24.56 mm	.85 mm	6 mm	75 mm	<b>V885910</b>	87.50	<b>V885910-V</b>	95.00
.1653	4.200 mm	.496	<b>12.60 mm</b>	<b>(3x)</b>	16.34 mm	.87 mm	6 mm	63 mm	<b>V106883</b>	50.50	<b>V106883-V</b>	58.00
.1653	4.200 mm	.826	<b>21.00 mm</b>	<b>(5x)</b>	25.16 mm	.87 mm	6 mm	75 mm	<b>V261808</b>	87.50	<b>V261808-V</b>	95.00
.1692	4.300 mm	.507	<b>12.90 mm</b>	<b>(3x)</b>	16.73 mm	.89 mm	6 mm	63 mm	<b>V831806</b>	50.50	<b>V831806-V</b>	58.00
.1692	4.300 mm	.846	<b>21.50 mm</b>	<b>(5x)</b>	25.76 mm	.89 mm	6 mm	75 mm	<b>V911321</b>	87.50	<b>V911321-V</b>	95.00
.1718 (11/64)	4.365 mm	.515	<b>13.10 mm</b>	<b>(3x)</b>	16.99 mm	.90 mm	6 mm	63 mm	<b>V639993</b>	50.50	<b>V639993-V</b>	58.00
.1718 (11/64)	4.365 mm	.860	<b>21.85 mm</b>	<b>(5x)</b>	26.15 mm	.90 mm	6 mm	75 mm	<b>V374159</b>	87.50	<b>V374159-V</b>	95.00
.1732	4.400 mm	.519	<b>13.20 mm</b>	<b>(3x)</b>	17.12 mm	.91 mm	6 mm	63 mm	<b>V582968</b>	50.50	<b>V582968-V</b>	58.00
.1732	4.400 mm	.866	<b>22.00 mm</b>	<b>(5x)</b>	26.36 mm	.91 mm	6 mm	75 mm	<b>V197740</b>	87.50	<b>V197740-V</b>	95.00
.1771	4.500 mm	.531	<b>13.50 mm</b>	<b>(3x)</b>	17.51 mm	.93 mm	6 mm	63 mm	<b>V956195</b>	50.50	<b>V956195-V</b>	58.00
.1771	4.500 mm	.885	<b>22.50 mm</b>	<b>(5x)</b>	26.96 mm	.93 mm	6 mm	75 mm	<b>V441617</b>	87.50	<b>V441617-V</b>	95.00
.1811	4.600 mm	.543	<b>13.80 mm</b>	<b>(3x)</b>	17.90 mm	.95 mm	6 mm	63 mm	<b>V866527</b>	50.50	<b>V866527-V</b>	58.00
.1811	4.600 mm	.905	<b>23.00 mm</b>	<b>(5x)</b>	27.56 mm	.95 mm	6 mm	75 mm	<b>V224773</b>	87.50	<b>V224773-V</b>	95.00
.1850	4.700 mm	.555	<b>14.10 mm</b>	<b>(3x)</b>	18.29 mm	.97 mm	6 mm	63 mm	<b>V344265</b>	50.50	<b>V344265-V</b>	58.00
.1850	4.700 mm	.925	<b>23.50 mm</b>	<b>(5x)</b>	28.16 mm	.97 mm	6 mm	75 mm	<b>V433090</b>	87.50	<b>V433090-V</b>	95.00
.1875 (3/16)	4.762 mm	.562	<b>14.30 mm</b>	<b>(3x)</b>	18.53 mm	.99 mm	6 mm	63 mm	<b>V850660</b>	50.50	<b>V850660-V</b>	58.00
.1875 (3/16)	4.762 mm	.937	<b>23.80 mm</b>	<b>(5x)</b>	28.53 mm	.99 mm	6 mm	75 mm	<b>V771194</b>	87.50	<b>V771194-V</b>	95.00
.1890	4.800 mm	.566	<b>14.40 mm</b>	<b>(3x)</b>	18.68 mm	.99 mm	6 mm	63 mm	<b>V568557</b>	50.50	<b>V568557-V</b>	58.00
.1890	4.800 mm	.944	<b>24.00 mm</b>	<b>(5x)</b>	28.76 mm	.99 mm	6 mm	75 mm	<b>V856912</b>	87.50	<b>V856912-V</b>	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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2										
.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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price	Tool #	Price
.4062 (13/32)	10.317 mm	1.218	<b>30.95 mm</b>	<b>(3x)</b>	40.15 mm	2.14 mm	12 mm	100 mm	<b>V576080</b>	105.60	<b>V576080-V</b>	121.50
.4062 (13/32)	10.317 mm	2.031	<b>51.60 mm</b>	<b>(5x)</b>	61.82 mm	2.14 mm	12 mm	125 mm	<b>V227073</b>	204.60	<b>V227073-V</b>	221.50
.4094	10.400 mm	1.228	<b>31.20 mm</b>	<b>(3x)</b>	40.48 mm	2.15 mm	12 mm	100 mm	<b>V708410</b>	105.60	<b>V708410-V</b>	121.50
.4094	10.400 mm	2.047	<b>52.00 mm</b>	<b>(5x)</b>	62.32 mm	2.15 mm	12 mm	125 mm	<b>V195280</b>	204.60	<b>V195280-V</b>	221.50
.4134	10.500 mm	1.240	<b>31.50 mm</b>	<b>(3x)</b>	40.87 mm	2.17 mm	12 mm	100 mm	<b>V879946</b>	105.60	<b>V879946-V</b>	121.50
.4134	10.500 mm	2.066	<b>52.50 mm</b>	<b>(5x)</b>	62.92 mm	2.17 mm	12 mm	125 mm	<b>V496598</b>	204.60	<b>V496598-V</b>	221.50
.4173	10.600 mm	1.251	<b>31.80 mm</b>	<b>(3x)</b>	41.26 mm	2.20 mm	12 mm	100 mm	<b>V455218</b>	105.60	<b>V455218-V</b>	121.50
.4173	10.600 mm	2.086	<b>53.00 mm</b>	<b>(5x)</b>	63.52 mm	2.20 mm	12 mm	125 mm	<b>V452314</b>	204.60	<b>V452314-V</b>	221.50
.4213	10.700 mm	1.263	<b>32.10 mm</b>	<b>(3x)</b>	41.64 mm	2.22 mm	12 mm	100 mm	<b>V155404</b>	105.60	<b>V155404-V</b>	121.50
.4213	10.700 mm	2.106	<b>53.50 mm</b>	<b>(5x)</b>	64.11 mm	2.22 mm	12 mm	125 mm	<b>V634560</b>	204.60	<b>V634560-V</b>	221.50
.4219 (27/64)	10.716 mm	1.265	<b>32.15 mm</b>	<b>(3x)</b>	41.71 mm	2.22 mm	12 mm	100 mm	<b>V826638</b>	105.60	<b>V826638-V</b>	121.50
.4219 (27/64)	10.716 mm	2.110	<b>53.60 mm</b>	<b>(5x)</b>	64.21 mm	2.22 mm	12 mm	125 mm	<b>V814056</b>	204.60	<b>V814056-V</b>	221.50
.4252	10.800 mm	1.275	<b>32.40 mm</b>	<b>(3x)</b>	42.03 mm	2.24 mm	12 mm	100 mm	<b>V213641</b>	105.60	<b>V213641-V</b>	121.50
.4252	10.800 mm	2.125	<b>54.00 mm</b>	<b>(5x)</b>	64.71 mm	2.24 mm	12 mm	125 mm	<b>V455956</b>	204.60	<b>V455956-V</b>	221.50
.4291	10.900 mm	1.287	<b>32.70 mm</b>	<b>(3x)</b>	42.42 mm	2.26 mm	12 mm	100 mm	<b>V681558</b>	105.60	<b>V681558-V</b>	121.50
.4291	10.900 mm	2.145	<b>54.50 mm</b>	<b>(5x)</b>	65.31 mm	2.26 mm	12 mm	125 mm	<b>V872776</b>	204.60	<b>V872776-V</b>	221.50
.4331	11.000 mm	1.299	<b>33.00 mm</b>	<b>(3x)</b>	42.81 mm	2.28 mm	12 mm	100 mm	<b>V486441</b>	105.60	<b>V486441-V</b>	121.50
.4331	11.000 mm	2.165	<b>55.00 mm</b>	<b>(5x)</b>	65.91 mm	2.28 mm	12 mm	125 mm	<b>V840142</b>	204.60	<b>V840142-V</b>	221.50
.4370	11.100 mm	1.311	<b>33.30 mm</b>	<b>(3x)</b>	43.20 mm	2.30 mm	12 mm	100 mm	<b>V569821</b>	115.00	<b>V569821-V</b>	131.00
.4370	11.100 mm	2.185	<b>55.50 mm</b>	<b>(5x)</b>	66.51 mm	2.30 mm	12 mm	125 mm	<b>V786789</b>	210.00	<b>V786789-V</b>	227.00
.4375 (7/16)	11.112 mm	1.312	<b>33.35 mm</b>	<b>(3x)</b>	43.25 mm	2.30 mm	12 mm	100 mm	<b>V194265</b>	115.00	<b>V194265-V</b>	131.00
.4375 (7/16)	11.112 mm	2.187	<b>55.55 mm</b>	<b>(5x)</b>	66.58 mm	2.30 mm	12 mm	125 mm	<b>V266796</b>	210.00	<b>V266796-V</b>	227.00
.4409	11.200 mm	1.322	<b>33.60 mm</b>	<b>(3x)</b>	43.59 mm	2.32 mm	12 mm	100 mm	<b>V800667</b>	115.00	<b>V800667-V</b>	131.00
.4409	11.200 mm	2.204	<b>56.00 mm</b>	<b>(5x)</b>	67.11 mm	2.32 mm	12 mm	125 mm	<b>V503159</b>	210.00	<b>V503159-V</b>	227.00
.4449	11.300 mm	1.334	<b>33.90 mm</b>	<b>(3x)</b>	43.98 mm	2.34 mm	12 mm	100 mm	<b>V309259</b>	115.00	<b>V309259-V</b>	131.00
.4449	11.300 mm	2.224	<b>56.50 mm</b>	<b>(5x)</b>	67.71 mm	2.34 mm	12 mm	125 mm	<b>V346861</b>	210.00	<b>V346861-V</b>	227.00
.4488	11.400 mm	1.346	<b>34.20 mm</b>	<b>(3x)</b>	44.37 mm	2.36 mm	12 mm	100 mm	<b>V434511</b>	115.00	<b>V434511-V</b>	131.00
.4488	11.400 mm	2.244	<b>57.00 mm</b>	<b>(5x)</b>	68.31 mm	2.36 mm	12 mm	125 mm	<b>V662862</b>	210.00	<b>V662862-V</b>	227.00
.4527	11.500 mm	1.358	<b>34.50 mm</b>	<b>(3x)</b>	44.76 mm	2.38 mm	12 mm	100 mm	<b>V848030</b>	115.00	<b>V848030-V</b>	131.00
.4527	11.500 mm	2.263	<b>57.50 mm</b>	<b>(5x)</b>	68.91 mm	2.38 mm	12 mm	125 mm	<b>V786485</b>	210.00	<b>V786485-V</b>	227.00
.4531 (29/64)	11.508 mm	1.358	<b>34.50 mm</b>	<b>(3x)</b>	44.79 mm	2.38 mm	12 mm	100 mm	<b>V293298</b>	115.00	<b>V293298-V</b>	131.00
.4531 (29/64)	11.508 mm	2.265	<b>57.55 mm</b>	<b>(5x)</b>	68.96 mm	2.38 mm	12 mm	125 mm	<b>V128189</b>	210.00	<b>V128189-V</b>	227.00
.4567	11.600 mm	1.370	<b>34.80 mm</b>	<b>(3x)</b>	45.15 mm	2.40 mm	12 mm	100 mm	<b>V713188</b>	115.00	<b>V713188-V</b>	131.00
.4567	11.600 mm	2.283	<b>58.00 mm</b>	<b>(5x)</b>	69.51 mm	2.40 mm	12 mm	125 mm	<b>V314182</b>	210.00	<b>V314182-V</b>	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	L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1	Tool #	Price	Tool #	Price
.4606	11.700 mm	1.381	<b>35.10 mm</b>	<b>(3x)</b>	45.54 mm	2.42 mm	12 mm	100 mm	<b>V136399</b>	115.00	<b>V136399-V</b>	131.00
.4606	11.700 mm	2.303	<b>58.50 mm</b>	<b>(5x)</b>	70.11 mm	2.42 mm	12 mm	125 mm	<b>V357863</b>	210.00	<b>V357863-V</b>	227.00
.4646	11.800 mm	1.393	<b>35.40 mm</b>	<b>(3x)</b>	45.93 mm	2.44 mm	12 mm	100 mm	<b>V891844</b>	115.00	<b>V891844-V</b>	131.00
.4646	11.800 mm	2.322	<b>59.00 mm</b>	<b>(5x)</b>	70.71 mm	2.44 mm	12 mm	125 mm	<b>V101325</b>	210.00	<b>V101325-V</b>	227.00
.4685	11.900 mm	1.405	<b>35.70 mm</b>	<b>(3x)</b>	46.32 mm	2.46 mm	12 mm	100 mm	<b>V393491</b>	115.00	<b>V393491-V</b>	131.00
.4685	11.900 mm	2.342	<b>59.50 mm</b>	<b>(5x)</b>	71.31 mm	2.46 mm	12 mm	125 mm	<b>V470839</b>	210.00	<b>V470839-V</b>	227.00
.4688 (15/32)	11.907 mm	1.405	<b>35.70 mm</b>	<b>(3x)</b>	46.34 mm	2.47 mm	12 mm	100 mm	<b>V477349</b>	115.00	<b>V477349-V</b>	131.00
.4688 (15/32)	11.907 mm	2.344	<b>59.55 mm</b>	<b>(5x)</b>	71.35 mm	2.47 mm	12 mm	125 mm	<b>V910118</b>	210.00	<b>V910118-V</b>	227.00
.4724	12.000 mm	1.417	<b>36.00 mm</b>	<b>(3x)</b>	46.70 mm	2.49 mm	14 mm	100 mm	<b>V890909</b>	115.00	<b>V890909-V</b>	133.50
.4724	12.000 mm	2.362	<b>60.00 mm</b>	<b>(5x)</b>	71.90 mm	2.49 mm	14 mm	125 mm	<b>V660828</b>	210.00	<b>V660828-V</b>	229.50
.4764	12.100 mm	1.429	<b>36.30 mm</b>	<b>(3x)</b>	47.09 mm	2.51 mm	14 mm	100 mm	<b>V634940</b>	151.50	<b>V634940-V</b>	170.00
.4764	12.100 mm	2.381	<b>60.50 mm</b>	<b>(5x)</b>	72.50 mm	2.51 mm	14 mm	125 mm	<b>V932711</b>	263.00	<b>V932711-V</b>	282.50
.4803	12.200 mm	1.440	<b>36.60 mm</b>	<b>(3x)</b>	47.48 mm	2.53 mm	14 mm	100 mm	<b>V905748</b>	151.50	<b>V905748-V</b>	170.00
.4803	12.200 mm	2.401	<b>61.00 mm</b>	<b>(5x)</b>	73.10 mm	2.53 mm	14 mm	125 mm	<b>V781595</b>	263.00	<b>V781595-V</b>	282.50
.4843	12.300 mm	1.452	<b>36.90 mm</b>	<b>(3x)</b>	47.87 mm	2.55 mm	14 mm	100 mm	<b>V170687</b>	151.50	<b>V170687-V</b>	170.00
.4843	12.300 mm	2.421	<b>61.50 mm</b>	<b>(5x)</b>	73.70 mm	2.55 mm	14 mm	125 mm	<b>V699007</b>	263.00	<b>V699007-V</b>	282.50
.4882 (31/64)	12.400 mm	1.464	<b>37.20 mm</b>	<b>(3x)</b>	48.26 mm	2.57 mm	14 mm	100 mm	<b>V359843</b>	151.50	<b>V359843-V</b>	170.00
.4882 (31/64)	12.400 mm	2.440	<b>62.00 mm</b>	<b>(5x)</b>	74.30 mm	2.57 mm	14 mm	125 mm	<b>V692988</b>	263.00	<b>V692988-V</b>	282.50
.4921	12.500 mm	1.476	<b>37.50 mm</b>	<b>(3x)</b>	48.65 mm	2.59 mm	14 mm	100 mm	<b>V512726</b>	151.50	<b>V512726-V</b>	170.00
.4921	12.500 mm	2.460	<b>62.50 mm</b>	<b>(5x)</b>	74.90 mm	2.59 mm	14 mm	125 mm	<b>V684136</b>	263.00	<b>V684136-V</b>	282.50
.4961	12.600 mm	1.488	<b>37.80 mm</b>	<b>(3x)</b>	49.04 mm	2.61 mm	14 mm	100 mm	<b>V622722</b>	165.20	<b>V622722-V</b>	183.50
.4961	12.600 mm	2.480	<b>63.00 mm</b>	<b>(5x)</b>	75.50 mm	2.61 mm	14 mm	125 mm	<b>V951870</b>	263.00	<b>V951870-V</b>	282.50
.5000 (1/2)	12.700 mm	1.499	<b>38.10 mm</b>	<b>(3x)</b>	49.43 mm	2.63 mm	14 mm	100 mm	<b>V503316</b>	165.20	<b>V503316-V</b>	183.50
.5000 (1/2)	12.700 mm	2.499	<b>63.50 mm</b>	<b>(5x)</b>	76.10 mm	2.63 mm	14 mm	125 mm	<b>V805106</b>	263.00	<b>V805106-V</b>	282.50

\* For h6 and h8 tolerances, see page 8.

# Tech Tip

If your machine does not have coolant-through 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.



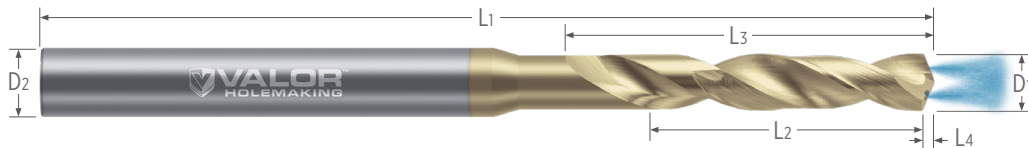
# High Performance Drills

For Aluminum & Aluminum Alloys – Coolant-Through



## 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

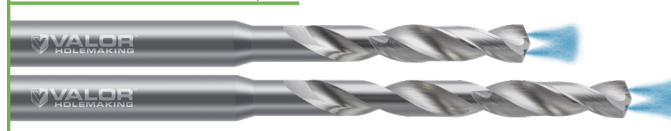


Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth					Tool #	Price	Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1				
.0625 (1/16)	1.587 mm	.312	<b>7.95 mm</b>	(5x)	9.51 mm	.33 mm	3 mm	63 mm	<b>V995092</b>	95.50	<b>V995092-V</b>	101.00
.0625 (1/16)	1.587 mm	.499	<b>12.70 mm</b>	(8x)	14.50 mm	.33 mm	3 mm	63 mm	<b>V484828</b>	162.50	<b>V484828-V</b>	168.00
.0630	1.600 mm	.314	<b>8.00 mm</b>	(5x)	9.58 mm	.33 mm	3 mm	63 mm	<b>V501534</b>	95.50	<b>V501534-V</b>	101.00
.0630	1.600 mm	.503	<b>12.80 mm</b>	(8x)	14.62 mm	.33 mm	3 mm	63 mm	<b>V680349</b>	162.50	<b>V680349-V</b>	168.00
.0669	1.700 mm	.334	<b>8.50 mm</b>	(5x)	10.18 mm	.35 mm	3 mm	63 mm	<b>V605780</b>	95.50	<b>V605780-V</b>	101.00
.0669	1.700 mm	.535	<b>13.60 mm</b>	(8x)	15.54 mm	.35 mm	3 mm	63 mm	<b>V910907</b>	162.50	<b>V910907-V</b>	168.00
.0708	1.800 mm	.354	<b>9.00 mm</b>	(5x)	10.78 mm	.37 mm	3 mm	63 mm	<b>V322492</b>	95.50	<b>V322492-V</b>	101.00
.0708	1.800 mm	.566	<b>14.40 mm</b>	(8x)	16.45 mm	.37 mm	3 mm	63 mm	<b>V882014</b>	162.50	<b>V882014-V</b>	168.00
.0748	1.900 mm	.374	<b>9.50 mm</b>	(5x)	11.38 mm	.39 mm	3 mm	63 mm	<b>V531576</b>	95.50	<b>V531576-V</b>	101.00
.0748	1.900 mm	.598	<b>15.20 mm</b>	(8x)	17.37 mm	.39 mm	3 mm	63 mm	<b>V421746</b>	162.50	<b>V421746-V</b>	168.00
.0781 (5/64)	1.984 mm	.389	<b>9.90 mm</b>	(5x)	11.88 mm	.41 mm	3 mm	63 mm	<b>V658747</b>	95.50	<b>V658747-V</b>	101.00
.0781 (5/64)	1.984 mm	.624	<b>15.85 mm</b>	(8x)	18.13 mm	.41 mm	3 mm	63 mm	<b>V880813</b>	162.50	<b>V880813-V</b>	168.00
.0787	2.000 mm	.393	<b>10.00 mm</b>	(5x)	11.98 mm	.41 mm	3 mm	63 mm	<b>V420395</b>	95.50	<b>V420395-V</b>	101.00
.0787	2.000 mm	.629	<b>16.00 mm</b>	(8x)	18.28 mm	.41 mm	3 mm	63 mm	<b>V492205</b>	162.50	<b>V492205-V</b>	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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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					Tool #	Price	Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1				
.1406 (9/64)	3.571 mm	.702	<b>17.85 mm</b>	<b>(5x)</b>	21.39 mm	.74 mm	4 mm	63 mm	<b>V767730</b>	95.50	<b>V767730-V</b>	102.00
.1406 (9/64)	3.571 mm	1.124	<b>28.55 mm</b>	<b>(8x)</b>	32.64 mm	.74 mm	4 mm	75 mm	<b>V333089</b>	162.50	<b>V333089-V</b>	169.00
.1417	3.600 mm	.708	<b>18.00 mm</b>	<b>(5x)</b>	21.57 mm	.75 mm	4 mm	63 mm	<b>V139840</b>	95.50	<b>V139840-V</b>	102.00
.1417	3.600 mm	1.133	<b>28.80 mm</b>	<b>(8x)</b>	32.91 mm	.75 mm	4 mm	75 mm	<b>V241917</b>	162.50	<b>V241917-V</b>	169.00
.1456	3.700 mm	.728	<b>18.50 mm</b>	<b>(5x)</b>	22.17 mm	.77 mm	4 mm	63 mm	<b>V441225</b>	95.50	<b>V441225-V</b>	102.00
.1456	3.700 mm	1.165	<b>29.60 mm</b>	<b>(8x)</b>	33.82 mm	.77 mm	4 mm	75 mm	<b>V869984</b>	162.50	<b>V869984-V</b>	169.00
.1496	3.800 mm	.748	<b>19.00 mm</b>	<b>(5x)</b>	22.77 mm	.79 mm	4 mm	63 mm	<b>V818024</b>	95.50	<b>V818024-V</b>	102.00
.1496	3.800 mm	1.196	<b>30.40 mm</b>	<b>(8x)</b>	34.74 mm	.79 mm	4 mm	75 mm	<b>V756236</b>	162.50	<b>V756236-V</b>	169.00
.1535	3.900 mm	.767	<b>19.50 mm</b>	<b>(5x)</b>	23.37 mm	.81 mm	4 mm	63 mm	<b>V429888</b>	95.50	<b>V429888-V</b>	102.00
.1535	3.900 mm	1.228	<b>31.20 mm</b>	<b>(8x)</b>	35.65 mm	.81 mm	4 mm	75 mm	<b>V832803</b>	162.50	<b>V832803-V</b>	169.00
.1562 (5/32)	3.968 mm	.781	<b>19.85 mm</b>	<b>(5x)</b>	23.77 mm	.82 mm	4 mm	63 mm	<b>V205668</b>	95.50	<b>V205668-V</b>	102.00
.1562 (5/32)	3.968 mm	1.249	<b>31.75 mm</b>	<b>(8x)</b>	36.27 mm	.82 mm	4 mm	75 mm	<b>V576052</b>	162.50	<b>V576052-V</b>	169.00
.1574	4.000 mm	.787	<b>20.00 mm</b>	<b>(5x)</b>	23.96 mm	.83 mm	6 mm	75 mm	<b>V131303</b>	99.50	<b>V131303-V</b>	107.00
.1574	4.000 mm	1.259	<b>32.00 mm</b>	<b>(8x)</b>	36.56 mm	.83 mm	6 mm	100 mm	<b>V305691</b>	162.50	<b>V305691-V</b>	170.50
.1614	4.100 mm	.807	<b>20.50 mm</b>	<b>(5x)</b>	24.56 mm	.85 mm	6 mm	75 mm	<b>V679258</b>	99.50	<b>V679258-V</b>	107.00
.1614	4.100 mm	1.291	<b>32.80 mm</b>	<b>(8x)</b>	37.48 mm	.85 mm	6 mm	100 mm	<b>V557129</b>	162.50	<b>V557129-V</b>	170.50
.1653	4.200 mm	.826	<b>21.00 mm</b>	<b>(5x)</b>	25.16 mm	.87 mm	6 mm	75 mm	<b>V803894</b>	99.50	<b>V803894-V</b>	107.00
.1653	4.200 mm	1.322	<b>33.60 mm</b>	<b>(8x)</b>	38.39 mm	.87 mm	6 mm	100 mm	<b>V752243</b>	162.50	<b>V752243-V</b>	170.50
.1692	4.300 mm	.846	<b>21.50 mm</b>	<b>(5x)</b>	25.76 mm	.89 mm	6 mm	75 mm	<b>V223762</b>	99.50	<b>V223762-V</b>	107.00
.1692	4.300 mm	1.354	<b>34.40 mm</b>	<b>(8x)</b>	39.31 mm	.89 mm	6 mm	100 mm	<b>V775572</b>	162.50	<b>V775572-V</b>	170.50
.1718 (11/64)	4.365 mm	.860	<b>21.85 mm</b>	<b>(5x)</b>	26.15 mm	.90 mm	6 mm	75 mm	<b>V639751</b>	99.50	<b>V639751-V</b>	107.00
.1718 (11/64)	4.365 mm	1.374	<b>34.90 mm</b>	<b>(8x)</b>	39.90 mm	.90 mm	6 mm	100 mm	<b>V849166</b>	162.50	<b>V849166-V</b>	170.50
.1732	4.400 mm	.866	<b>22.00 mm</b>	<b>(5x)</b>	26.36 mm	.91 mm	6 mm	75 mm	<b>V918663</b>	99.50	<b>V918663-V</b>	107.00
.1732	4.400 mm	1.385	<b>35.20 mm</b>	<b>(8x)</b>	40.22 mm	.91 mm	6 mm	100 mm	<b>V356654</b>	162.50	<b>V356654-V</b>	170.50
.1771	4.500 mm	.885	<b>22.50 mm</b>	<b>(5x)</b>	26.96 mm	.93 mm	6 mm	75 mm	<b>V383315</b>	99.50	<b>V383315-V</b>	107.00
.1771	4.500 mm	1.417	<b>36.00 mm</b>	<b>(8x)</b>	41.14 mm	.93 mm	6 mm	100 mm	<b>V703950</b>	162.50	<b>V703950-V</b>	170.50
.1811	4.600 mm	.905	<b>23.00 mm</b>	<b>(5x)</b>	27.56 mm	.95 mm	6 mm	75 mm	<b>V342441</b>	99.50	<b>V342441-V</b>	107.00
.1811	4.600 mm	1.448	<b>36.80 mm</b>	<b>(8x)</b>	42.05 mm	.95 mm	6 mm	100 mm	<b>V202174</b>	162.50	<b>V202174-V</b>	170.50
.1850	4.700 mm	.925	<b>23.50 mm</b>	<b>(5x)</b>	28.16 mm	.97 mm	6 mm	75 mm	<b>V689582</b>	99.50	<b>V689582-V</b>	107.00
.1850	4.700 mm	1.480	<b>37.60 mm</b>	<b>(8x)</b>	42.96 mm	.97 mm	6 mm	100 mm	<b>V928497</b>	162.50	<b>V928497-V</b>	170.50
.1875 (3/16)	4.762 mm	.937	<b>23.80 mm</b>	<b>(5x)</b>	28.53 mm	.99 mm	6 mm	75 mm	<b>V675548</b>	99.50	<b>V675548-V</b>	107.00
.1875 (3/16)	4.762 mm	1.499	<b>38.10 mm</b>	<b>(8x)</b>	43.53 mm	.99 mm	6 mm	100 mm	<b>V431500</b>	162.50	<b>V431500-V</b>	170.50
.1890	4.800 mm	.944	<b>24.00 mm</b>	<b>(5x)</b>	28.76 mm	.99 mm	6 mm	75 mm	<b>V926654</b>	99.50	<b>V926654-V</b>	107.00
.1890	4.800 mm	1.511	<b>38.40 mm</b>	<b>(8x)</b>	43.88 mm	.99 mm	6 mm	100 mm	<b>V253484</b>	162.50	<b>V253484-V</b>	170.50
.1930	4.900 mm	.964	<b>24.50 mm</b>	<b>(5x)</b>	29.36 mm	1.01 mm	6 mm	75 mm	<b>V417508</b>	99.50	<b>V417508-V</b>	107.00
.1930	4.900 mm	1.543	<b>39.20 mm</b>	<b>(8x)</b>	44.79 mm	1.01 mm	6 mm	100 mm	<b>V904772</b>	162.50	<b>V904772-V</b>	170.50

\* 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					Tool #	Price	Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1				
.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					Tool #	Price	Tool #	Price
	D <sub>1</sub> (h8)*		L <sub>2</sub>		L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>				
.2520	6.400 mm	1.259	<b>32.00 mm</b>	<b>(5x)</b>	38.35 mm	1.33 mm	8 mm	100 mm	<b>V952739</b>	128.50	<b>V952739-V</b>	138.50
.2520	6.400 mm	2.015	<b>51.20 mm</b>	<b>(8x)</b>	58.51 mm	1.33 mm	8 mm	125 mm	<b>V442929</b>	223.00	<b>V442929-V</b>	233.50
.2559	6.500 mm	1.279	<b>32.50 mm</b>	<b>(5x)</b>	38.95 mm	1.35 mm	8 mm	100 mm	<b>V252657</b>	128.50	<b>V252657-V</b>	138.50
.2559	6.500 mm	2.047	<b>52.00 mm</b>	<b>(8x)</b>	59.42 mm	1.35 mm	8 mm	125 mm	<b>V981850</b>	223.00	<b>V981850-V</b>	233.50
.2598	6.600 mm	1.299	<b>33.00 mm</b>	<b>(5x)</b>	39.55 mm	1.37 mm	8 mm	100 mm	<b>V522677</b>	128.50	<b>V522677-V</b>	138.50
.2598	6.600 mm	2.078	<b>52.80 mm</b>	<b>(8x)</b>	60.34 mm	1.37 mm	8 mm	125 mm	<b>V583091</b>	223.00	<b>V583091-V</b>	233.50
.2638	6.700 mm	1.318	<b>33.50 mm</b>	<b>(5x)</b>	40.14 mm	1.39 mm	8 mm	100 mm	<b>V144907</b>	128.50	<b>V144907-V</b>	138.50
.2638	6.700 mm	2.110	<b>53.60 mm</b>	<b>(8x)</b>	61.25 mm	1.39 mm	8 mm	125 mm	<b>V320537</b>	223.00	<b>V320537-V</b>	233.50
.2656 (17/64)	6.746 mm	1.328	<b>33.75 mm</b>	<b>(5x)</b>	40.42 mm	1.40 mm	8 mm	100 mm	<b>V822656</b>	128.50	<b>V822656-V</b>	138.50
.2656 (17/64)	6.746 mm	2.124	<b>53.95 mm</b>	<b>(8x)</b>	61.67 mm	1.40 mm	8 mm	125 mm	<b>V403247</b>	223.00	<b>V403247-V</b>	233.50
.2677	6.800 mm	1.338	<b>34.00 mm</b>	<b>(5x)</b>	40.74 mm	1.41 mm	8 mm	100 mm	<b>V390334</b>	128.50	<b>V390334-V</b>	138.50
.2677	6.800 mm	2.141	<b>54.40 mm</b>	<b>(8x)</b>	62.16 mm	1.41 mm	8 mm	125 mm	<b>V892039</b>	223.00	<b>V892039-V</b>	233.50
.2717	6.900 mm	1.358	<b>34.50 mm</b>	<b>(5x)</b>	41.34 mm	1.43 mm	8 mm	100 mm	<b>V359934</b>	128.50	<b>V359934-V</b>	138.50
.2717	6.900 mm	2.173	<b>55.20 mm</b>	<b>(8x)</b>	63.08 mm	1.43 mm	8 mm	125 mm	<b>V272766</b>	223.00	<b>V272766-V</b>	233.50
.2756	7.000 mm	1.377	<b>35.00 mm</b>	<b>(5x)</b>	41.94 mm	1.45 mm	8 mm	100 mm	<b>V849487</b>	128.50	<b>V849487-V</b>	138.50
.2756	7.000 mm	2.204	<b>56.00 mm</b>	<b>(8x)</b>	63.99 mm	1.45 mm	8 mm	125 mm	<b>V582978</b>	223.00	<b>V582978-V</b>	233.50
.2795	7.100 mm	1.397	<b>35.50 mm</b>	<b>(5x)</b>	42.54 mm	1.47 mm	8 mm	100 mm	<b>V608576</b>	128.50	<b>V608576-V</b>	138.50
.2795	7.100 mm	2.236	<b>56.80 mm</b>	<b>(8x)</b>	64.91 mm	1.47 mm	8 mm	125 mm	<b>V700117</b>	223.00	<b>V700117-V</b>	233.50
.2812 (9/32)	7.142 mm	1.405	<b>35.70 mm</b>	<b>(5x)</b>	42.79 mm	1.48 mm	8 mm	100 mm	<b>V808410</b>	128.50	<b>V808410-V</b>	138.50
.2812 (9/32)	7.142 mm	2.249	<b>57.15 mm</b>	<b>(8x)</b>	65.29 mm	1.48 mm	8 mm	125 mm	<b>V298615</b>	223.00	<b>V298615-V</b>	233.50
.2834	7.200 mm	1.417	<b>36.00 mm</b>	<b>(5x)</b>	43.14 mm	1.49 mm	8 mm	100 mm	<b>V476150</b>	128.50	<b>V476150-V</b>	138.50
.2834	7.200 mm	2.267	<b>57.60 mm</b>	<b>(8x)</b>	65.82 mm	1.49 mm	8 mm	125 mm	<b>V933182</b>	223.00	<b>V933182-V</b>	233.50
.2874	7.300 mm	1.437	<b>36.50 mm</b>	<b>(5x)</b>	43.74 mm	1.51 mm	8 mm	100 mm	<b>V207592</b>	128.50	<b>V207592-V</b>	138.50
.2874	7.300 mm	2.299	<b>58.40 mm</b>	<b>(8x)</b>	66.73 mm	1.51 mm	8 mm	125 mm	<b>V359441</b>	223.00	<b>V359441-V</b>	233.50
.2913	7.400 mm	1.456	<b>37.00 mm</b>	<b>(5x)</b>	44.34 mm	1.53 mm	8 mm	100 mm	<b>V902089</b>	128.50	<b>V902089-V</b>	138.50
.2913	7.400 mm	2.330	<b>59.20 mm</b>	<b>(8x)</b>	67.65 mm	1.53 mm	8 mm	125 mm	<b>V654235</b>	223.00	<b>V654235-V</b>	233.50
.2952	7.500 mm	1.476	<b>37.50 mm</b>	<b>(5x)</b>	44.94 mm	1.55 mm	8 mm	100 mm	<b>V137771</b>	128.50	<b>V137771-V</b>	138.50
.2952	7.500 mm	2.362	<b>60.00 mm</b>	<b>(8x)</b>	68.56 mm	1.55 mm	8 mm	125 mm	<b>V444829</b>	223.00	<b>V444829-V</b>	233.50
.2969 (19/64)	7.541 mm	1.484	<b>37.70 mm</b>	<b>(5x)</b>	45.18 mm	1.56 mm	8 mm	100 mm	<b>V645522</b>	128.50	<b>V645522-V</b>	138.50
.2969 (19/64)	7.541 mm	2.375	<b>60.35 mm</b>	<b>(8x)</b>	68.94 mm	1.56 mm	8 mm	125 mm	<b>V319299</b>	223.00	<b>V319299-V</b>	233.50
.2992	7.600 mm	1.496	<b>38.00 mm</b>	<b>(5x)</b>	45.54 mm	1.57 mm	8 mm	100 mm	<b>V871764</b>	128.50	<b>V871764-V</b>	138.50
.2992	7.600 mm	2.393	<b>60.80 mm</b>	<b>(8x)</b>	69.48 mm	1.57 mm	8 mm	125 mm	<b>V937150</b>	223.00	<b>V937150-V</b>	233.50
.3031	7.700 mm	1.515	<b>38.50 mm</b>	<b>(5x)</b>	46.14 mm	1.59 mm	8 mm	100 mm	<b>V272800</b>	128.50	<b>V272800-V</b>	138.50
.3031	7.700 mm	2.425	<b>61.60 mm</b>	<b>(8x)</b>	70.39 mm	1.59 mm	8 mm	125 mm	<b>V733422</b>	223.00	<b>V733422-V</b>	233.50
.3071	7.800 mm	1.535	<b>39.00 mm</b>	<b>(5x)</b>	46.74 mm	1.62 mm	8 mm	100 mm	<b>V444378</b>	128.50	<b>V444378-V</b>	138.50
.3071	7.800 mm	2.456	<b>62.40 mm</b>	<b>(8x)</b>	71.31 mm	1.62 mm	8 mm	125 mm	<b>V467902</b>	223.00	<b>V467902-V</b>	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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price	Tool #	Price
.3110	7.900 mm	1.555	<b>39.50 mm</b>	<b>(5x)</b>	47.34 mm	1.64 mm	8 mm	100 mm	<b>V838506</b>	128.50	<b>V838506-V</b>	138.50
.3110	7.900 mm	2.488	<b>63.20 mm</b>	<b>(8x)</b>	72.22 mm	1.64 mm	8 mm	125 mm	<b>V118204</b>	223.00	<b>V118204-V</b>	233.50
.3125 (5/16)	7.937 mm	1.562	<b>39.70 mm</b>	<b>(5x)</b>	47.56 mm	1.64 mm	8 mm	100 mm	<b>V534118</b>	128.50	<b>V534118-V</b>	138.50
.3125 (5/16)	7.937 mm	2.499	<b>63.50 mm</b>	<b>(8x)</b>	72.56 mm	1.64 mm	8 mm	125 mm	<b>V181162</b>	223.00	<b>V181162-V</b>	233.50
.3150	8.000 mm	1.574	<b>40.00 mm</b>	<b>(5x)</b>	47.93 mm	1.66 mm	10 mm	100 mm	<b>V631086</b>	128.50	<b>V631086-V</b>	140.00
.3150	8.000 mm	2.519	<b>64.00 mm</b>	<b>(8x)</b>	73.13 mm	1.66 mm	10 mm	125 mm	<b>V372448</b>	223.00	<b>V372448-V</b>	235.50
.3189	8.100 mm	1.594	<b>40.50 mm</b>	<b>(5x)</b>	48.53 mm	1.68 mm	10 mm	100 mm	<b>V480410</b>	146.50	<b>V480410-V</b>	158.00
.3189	8.100 mm	2.551	<b>64.80 mm</b>	<b>(8x)</b>	74.05 mm	1.68 mm	10 mm	125 mm	<b>V373765</b>	244.50	<b>V373765-V</b>	257.00
.3228	8.200 mm	1.614	<b>41.00 mm</b>	<b>(5x)</b>	49.13 mm	1.70 mm	10 mm	100 mm	<b>V668382</b>	146.50	<b>V668382-V</b>	158.00
.3228	8.200 mm	2.582	<b>65.60 mm</b>	<b>(8x)</b>	74.96 mm	1.70 mm	10 mm	125 mm	<b>V581134</b>	244.50	<b>V581134-V</b>	257.00
.3268	8.300 mm	1.633	<b>41.50 mm</b>	<b>(5x)</b>	49.73 mm	1.72 mm	10 mm	100 mm	<b>V386606</b>	146.50	<b>V386606-V</b>	158.00
.3268	8.300 mm	2.614	<b>66.40 mm</b>	<b>(8x)</b>	75.88 mm	1.72 mm	10 mm	125 mm	<b>V496970</b>	244.50	<b>V496970-V</b>	257.00
.3281 (21/64)	8.333 mm	1.639	<b>41.65 mm</b>	<b>(5x)</b>	49.93 mm	1.73 mm	10 mm	100 mm	<b>V904466</b>	146.50	<b>V904466-V</b>	158.00
.3281 (21/64)	8.333 mm	2.624	<b>66.65 mm</b>	<b>(8x)</b>	76.18 mm	1.73 mm	10 mm	125 mm	<b>V185340</b>	244.50	<b>V185340-V</b>	257.00
.3307	8.400 mm	1.653	<b>42.00 mm</b>	<b>(5x)</b>	50.33 mm	1.74 mm	10 mm	100 mm	<b>V336999</b>	146.50	<b>V336999-V</b>	158.00
.3307	8.400 mm	2.645	<b>67.20 mm</b>	<b>(8x)</b>	76.79 mm	1.74 mm	10 mm	125 mm	<b>V555396</b>	244.50	<b>V555396-V</b>	257.00
.3346	8.500 mm	1.673	<b>42.50 mm</b>	<b>(5x)</b>	50.93 mm	1.76 mm	10 mm	100 mm	<b>V944598</b>	146.50	<b>V944598-V</b>	158.00
.3346	8.500 mm	2.677	<b>68.00 mm</b>	<b>(8x)</b>	77.71 mm	1.76 mm	10 mm	125 mm	<b>V102862</b>	244.50	<b>V102862-V</b>	257.00
.3386	8.600 mm	1.692	<b>43.00 mm</b>	<b>(5x)</b>	51.53 mm	1.78 mm	10 mm	100 mm	<b>V129890</b>	146.50	<b>V129890-V</b>	158.00
.3386	8.600 mm	2.708	<b>68.80 mm</b>	<b>(8x)</b>	78.62 mm	1.78 mm	10 mm	125 mm	<b>V259256</b>	244.50	<b>V259256-V</b>	257.00
.3425	8.700 mm	1.712	<b>43.50 mm</b>	<b>(5x)</b>	52.13 mm	1.80 mm	10 mm	100 mm	<b>V364436</b>	146.50	<b>V364436-V</b>	158.00
.3425	8.700 mm	2.740	<b>69.60 mm</b>	<b>(8x)</b>	79.53 mm	1.80 mm	10 mm	125 mm	<b>V578927</b>	244.50	<b>V578927-V</b>	257.00
.3438 (11/32)	8.732 mm	1.718	<b>43.65 mm</b>	<b>(5x)</b>	52.32 mm	1.81 mm	10 mm	100 mm	<b>V960893</b>	146.50	<b>V960893-V</b>	158.00
.3438 (11/32)	8.732 mm	2.749	<b>69.85 mm</b>	<b>(8x)</b>	79.83 mm	1.81 mm	10 mm	125 mm	<b>V828826</b>	244.50	<b>V828826-V</b>	257.00
.3465	8.800 mm	1.732	<b>44.00 mm</b>	<b>(5x)</b>	52.73 mm	1.82 mm	10 mm	100 mm	<b>V295589</b>	146.50	<b>V295589-V</b>	158.00
.3465	8.800 mm	2.771	<b>70.40 mm</b>	<b>(8x)</b>	80.45 mm	1.82 mm	10 mm	125 mm	<b>V682221</b>	244.50	<b>V682221-V</b>	257.00

\* For h6 and h8 tolerances, see page 8.

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# High Performance Drills

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

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth					Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>				
.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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# 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					Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>				
.4062 (13/32)	10.317 mm	2.031	<b>51.60 mm</b>	<b>(5x)</b>	61.82 mm	2.14 mm	12 mm	125 mm	<b>V426663</b>	206.00	<b>V426663-V</b>	223.00
.4062 (13/32)	10.317 mm	3.249	<b>82.55 mm</b>	<b>(8x)</b>	94.32 mm	2.14 mm	12 mm	150 mm	<b>V165261</b>	323.50	<b>V165261-V</b>	342.00
.4094	10.400 mm	2.047	<b>52.00 mm</b>	<b>(5x)</b>	62.32 mm	2.15 mm	12 mm	125 mm	<b>V805959</b>	206.00	<b>V805959-V</b>	223.00
.4094	10.400 mm	3.275	<b>83.20 mm</b>	<b>(8x)</b>	95.08 mm	2.15 mm	12 mm	150 mm	<b>V585515</b>	323.50	<b>V585515-V</b>	342.00
.4134	10.500 mm	2.066	<b>52.50 mm</b>	<b>(5x)</b>	62.92 mm	2.17 mm	12 mm	125 mm	<b>V891328</b>	206.00	<b>V891328-V</b>	223.00
.4134	10.500 mm	3.307	<b>84.00 mm</b>	<b>(8x)</b>	95.99 mm	2.17 mm	12 mm	150 mm	<b>V656520</b>	323.50	<b>V656520-V</b>	342.00
.4173	10.600 mm	2.086	<b>53.00 mm</b>	<b>(5x)</b>	63.52 mm	2.20 mm	12 mm	125 mm	<b>V811500</b>	206.00	<b>V811500-V</b>	223.00
.4173	10.600 mm	3.338	<b>84.80 mm</b>	<b>(8x)</b>	96.91 mm	2.20 mm	12 mm	150 mm	<b>V517271</b>	323.50	<b>V517271-V</b>	342.00
.4213	10.700 mm	2.106	<b>53.50 mm</b>	<b>(5x)</b>	64.11 mm	2.22 mm	12 mm	125 mm	<b>V980072</b>	206.00	<b>V980072-V</b>	223.00
.4213	10.700 mm	3.370	<b>85.60 mm</b>	<b>(8x)</b>	97.82 mm	2.22 mm	12 mm	150 mm	<b>V352223</b>	323.50	<b>V352223-V</b>	342.00
.4219 (27/64)	10.716 mm	2.110	<b>53.60 mm</b>	<b>(5x)</b>	64.21 mm	2.22 mm	12 mm	125 mm	<b>V422407</b>	206.00	<b>V422407-V</b>	223.00
.4219 (27/64)	10.716 mm	3.375	<b>85.75 mm</b>	<b>(8x)</b>	97.97 mm	2.22 mm	12 mm	150 mm	<b>V628625</b>	323.50	<b>V628625-V</b>	342.00
.4252	10.800 mm	2.125	<b>54.00 mm</b>	<b>(5x)</b>	64.71 mm	2.24 mm	12 mm	125 mm	<b>V433000</b>	206.00	<b>V433000-V</b>	223.00
.4252	10.800 mm	3.401	<b>86.40 mm</b>	<b>(8x)</b>	98.73 mm	2.24 mm	12 mm	150 mm	<b>V876124</b>	323.50	<b>V876124-V</b>	342.00
.4291	10.900 mm	2.145	<b>54.50 mm</b>	<b>(5x)</b>	65.31 mm	2.26 mm	12 mm	125 mm	<b>V507576</b>	206.00	<b>V507576-V</b>	223.00
.4291	10.900 mm	3.433	<b>87.20 mm</b>	<b>(8x)</b>	99.65 mm	2.26 mm	12 mm	175 mm	<b>V959173</b>	323.50	<b>V959173-V</b>	343.50
.4331	11.000 mm	2.165	<b>55.00 mm</b>	<b>(5x)</b>	65.91 mm	2.28 mm	12 mm	125 mm	<b>V216634</b>	206.00	<b>V216634-V</b>	223.00
.4331	11.000 mm	3.464	<b>88.00 mm</b>	<b>(8x)</b>	100.56 mm	2.28 mm	12 mm	175 mm	<b>V705619</b>	323.50	<b>V705619-V</b>	343.50
.4370	11.100 mm	2.185	<b>55.50 mm</b>	<b>(5x)</b>	66.51 mm	2.30 mm	12 mm	125 mm	<b>V838445</b>	206.00	<b>V838445-V</b>	223.00
.4370	11.100 mm	3.496	<b>88.80 mm</b>	<b>(8x)</b>	101.48 mm	2.30 mm	12 mm	175 mm	<b>V554353</b>	323.50	<b>V554353-V</b>	343.50
.4375 (7/16)	11.112 mm	2.187	<b>55.55 mm</b>	<b>(5x)</b>	66.58 mm	2.30 mm	12 mm	125 mm	<b>V258691</b>	206.00	<b>V258691-V</b>	223.00
.4375 (7/16)	11.112 mm	3.499	<b>88.90 mm</b>	<b>(8x)</b>	101.59 mm	2.30 mm	12 mm	175 mm	<b>V865610</b>	323.50	<b>V865610-V</b>	343.50
.4409	11.200 mm	2.204	<b>56.00 mm</b>	<b>(5x)</b>	67.11 mm	2.32 mm	12 mm	125 mm	<b>V837182</b>	206.00	<b>V837182-V</b>	223.00
.4409	11.200 mm	3.527	<b>89.60 mm</b>	<b>(8x)</b>	102.39 mm	2.32 mm	12 mm	175 mm	<b>V638291</b>	323.50	<b>V638291-V</b>	343.50
.4449	11.300 mm	2.224	<b>56.50 mm</b>	<b>(5x)</b>	67.71 mm	2.34 mm	12 mm	125 mm	<b>V104347</b>	206.00	<b>V104347-V</b>	223.00
.4449	11.300 mm	3.559	<b>90.40 mm</b>	<b>(8x)</b>	103.30 mm	2.34 mm	12 mm	175 mm	<b>V923125</b>	323.50	<b>V923125-V</b>	343.50
.4488	11.400 mm	2.244	<b>57.00 mm</b>	<b>(5x)</b>	68.31 mm	2.36 mm	12 mm	125 mm	<b>V145663</b>	206.00	<b>V145663-V</b>	223.00
.4488	11.400 mm	3.590	<b>91.20 mm</b>	<b>(8x)</b>	104.22 mm	2.36 mm	12 mm	175 mm	<b>V218282</b>	323.50	<b>V218282-V</b>	343.50
.4527	11.500 mm	2.263	<b>57.50 mm</b>	<b>(5x)</b>	68.91 mm	2.38 mm	12 mm	125 mm	<b>V845377</b>	206.00	<b>V845377-V</b>	223.00
.4527	11.500 mm	3.622	<b>92.00 mm</b>	<b>(8x)</b>	105.13 mm	2.38 mm	12 mm	175 mm	<b>V679783</b>	323.50	<b>V679783-V</b>	343.50
.4531 (29/64)	11.508 mm	2.265	<b>57.55 mm</b>	<b>(5x)</b>	68.96 mm	2.38 mm	12 mm	125 mm	<b>V520815</b>	206.00	<b>V520815-V</b>	223.00
.4531 (29/64)	11.508 mm	3.624	<b>92.05 mm</b>	<b>(8x)</b>	105.21 mm	2.38 mm	12 mm	175 mm	<b>V960077</b>	323.50	<b>V960077-V</b>	343.50
.4567	11.600 mm	2.283	<b>58.00 mm</b>	<b>(5x)</b>	69.51 mm	2.40 mm	12 mm	125 mm	<b>V214907</b>	206.00	<b>V214907-V</b>	223.00
.4567	11.600 mm	3.653	<b>92.80 mm</b>	<b>(8x)</b>	106.05 mm	2.40 mm	12 mm	175 mm	<b>V307195</b>	323.50	<b>V307195-V</b>	343.50

\* For h6 and h8 tolerances, see page 8.

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# High Performance Drills

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

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Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Uncoated		Val-Max V Coated	
inch	metric	inch	metric	hole depth					Tool #	Price	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>				
.4606	11.700 mm	2.303	<b>58.50 mm</b>	<b>(5x)</b>	70.11 mm	2.42 mm	12 mm	125 mm	<b>V858509</b>	206.00	<b>V858509-V</b>	223.00
.4606	11.700 mm	3.685	<b>93.60 mm</b>	<b>(8x)</b>	106.96 mm	2.42 mm	12 mm	175 mm	<b>V313087</b>	323.50	<b>V313087-V</b>	343.50
.4646	11.800 mm	2.322	<b>59.00 mm</b>	<b>(5x)</b>	70.71 mm	2.44 mm	12 mm	125 mm	<b>V216870</b>	206.00	<b>V216870-V</b>	223.00
.4646	11.800 mm	3.716	<b>94.40 mm</b>	<b>(8x)</b>	107.88 mm	2.44 mm	12 mm	175 mm	<b>V902922</b>	323.50	<b>V902922-V</b>	343.50
.4685	11.900 mm	2.342	<b>59.50 mm</b>	<b>(5x)</b>	71.31 mm	2.46 mm	12 mm	125 mm	<b>V722943</b>	206.00	<b>V722943-V</b>	223.00
.4685	11.900 mm	3.748	<b>95.20 mm</b>	<b>(8x)</b>	108.79 mm	2.46 mm	12 mm	175 mm	<b>V889227</b>	323.50	<b>V889227-V</b>	343.50
.4688 (15/32)	11.907 mm	2.344	<b>59.55 mm</b>	<b>(5x)</b>	71.35 mm	2.47 mm	12 mm	125 mm	<b>V715708</b>	206.00	<b>V715708-V</b>	223.00
.4688 (15/32)	11.907 mm	3.749	<b>95.25 mm</b>	<b>(8x)</b>	108.85 mm	2.47 mm	12 mm	175 mm	<b>V209677</b>	323.50	<b>V209677-V</b>	343.50
.4724	12.000 mm	2.362	<b>60.00 mm</b>	<b>(5x)</b>	71.90 mm	2.49 mm	14 mm	125 mm	<b>V312296</b>	206.00	<b>V312296-V</b>	225.50
.4724	12.000 mm	3.779	<b>96.00 mm</b>	<b>(8x)</b>	109.70 mm	2.49 mm	14 mm	175 mm	<b>V339609</b>	323.50	<b>V339609-V</b>	346.50
.4764	12.100 mm	2.381	<b>60.50 mm</b>	<b>(5x)</b>	72.50 mm	2.51 mm	14 mm	125 mm	<b>V904889</b>	284.00	<b>V904889-V</b>	303.50
.4764	12.100 mm	3.811	<b>96.80 mm</b>	<b>(8x)</b>	110.62 mm	2.51 mm	14 mm	175 mm	<b>V264702</b>	437.50	<b>V264702-V</b>	460.50
.4803	12.200 mm	2.401	<b>61.00 mm</b>	<b>(5x)</b>	73.10 mm	2.53 mm	14 mm	125 mm	<b>V727024</b>	284.00	<b>V727024-V</b>	303.50
.4803	12.200 mm	3.842	<b>97.60 mm</b>	<b>(8x)</b>	111.53 mm	2.53 mm	14 mm	175 mm	<b>V954879</b>	437.50	<b>V954879-V</b>	460.50
.4843	12.300 mm	2.421	<b>61.50 mm</b>	<b>(5x)</b>	73.70 mm	2.55 mm	14 mm	125 mm	<b>V804318</b>	284.00	<b>V804318-V</b>	303.50
.4843	12.300 mm	3.874	<b>98.40 mm</b>	<b>(8x)</b>	112.45 mm	2.55 mm	14 mm	175 mm	<b>V559229</b>	437.50	<b>V559229-V</b>	460.50
.4882 (31/64)	12.400 mm	2.440	<b>62.00 mm</b>	<b>(5x)</b>	74.30 mm	2.57 mm	14 mm	125 mm	<b>V680043</b>	284.00	<b>V680043-V</b>	303.50
.4882 (31/64)	12.400 mm	3.905	<b>99.20 mm</b>	<b>(8x)</b>	113.36 mm	2.57 mm	14 mm	175 mm	<b>V597636</b>	437.50	<b>V597636-V</b>	460.50
.4921	12.500 mm	2.460	<b>62.50 mm</b>	<b>(5x)</b>	74.90 mm	2.59 mm	14 mm	125 mm	<b>V396773</b>	284.00	<b>V396773-V</b>	303.50
.4921	12.500 mm	3.937	<b>100.00 mm</b>	<b>(8x)</b>	114.28 mm	2.59 mm	14 mm	175 mm	<b>V576237</b>	437.50	<b>V576237-V</b>	460.50
.4961	12.600 mm	2.480	<b>63.00 mm</b>	<b>(5x)</b>	75.50 mm	2.61 mm	14 mm	125 mm	<b>V560508</b>	284.00	<b>V560508-V</b>	303.50
.4961	12.600 mm	3.968	<b>100.80 mm</b>	<b>(8x)</b>	115.19 mm	2.61 mm	14 mm	175 mm	<b>V511270</b>	437.50	<b>V511270-V</b>	460.50
.5000 (1/2)	12.700 mm	2.499	<b>63.50 mm</b>	<b>(5x)</b>	76.10 mm	2.63 mm	14 mm	125 mm	<b>V346191</b>	284.00	<b>V346191-V</b>	303.50
.5000 (1/2)	12.700 mm	3.999	<b>101.60 mm</b>	<b>(8x)</b>	116.10 mm	2.63 mm	14 mm	175 mm	<b>V190634</b>	437.50	<b>V190634-V</b>	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](http://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 Holesmaking 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](mailto:Valortech@harveyperformance.com).



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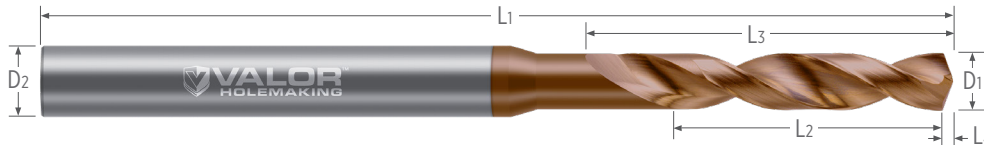
# High Performance Drills

## For Steels



### Exceptional Design for Precision Drilling in 4140 Steel

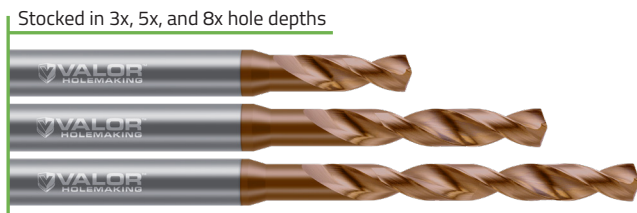
- Optimized for best-in-class performance in 4140 Steel with superior performance in a wide variety of Steels and other Alloy Steels
- Provides excellent performance in Stainless Steels and Cast Iron
- Engineered double margin geometry provides performance and stability when drilling intersecting holes 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					Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1		
.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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# 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.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.)

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						
	D1 (h8)*		L2		L3	L4	D2 (h6)*	L1	Tool #	Price
.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		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>T</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.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		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
	D <sub>1</sub> (h8)*		L <sub>2</sub>		L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>T</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth					Tool #	Price
	D1 (h8)*		L2		L3	L4	D2 (h6)*	L1		
.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		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.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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# 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 <sub>1</sub> (h8)*		L <sub>2</sub>		L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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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# 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.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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# 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					Tool #	Price
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1		
.4062 (13/32)	10.317 mm	1.218	<b>30.95 mm</b>	<b>(3x)</b>	39.88 mm	1.88 mm	12 mm	100 mm	<b>V558064-X</b>	136.00
.4062 (13/32)	10.317 mm	2.031	<b>51.60 mm</b>	<b>(5x)</b>	61.55 mm	1.88 mm	12 mm	125 mm	<b>V617000-X</b>	158.00
.4062 (13/32)	10.317 mm	3.249	<b>82.55 mm</b>	<b>(8x)</b>	94.05 mm	1.88 mm	12 mm	150 mm	<b>V184156-X</b>	331.00
.4094	10.400 mm	1.228	<b>31.20 mm</b>	<b>(3x)</b>	40.20 mm	1.89 mm	12 mm	100 mm	<b>V476483-X</b>	136.00
.4094	10.400 mm	2.047	<b>52.00 mm</b>	<b>(5x)</b>	62.04 mm	1.89 mm	12 mm	125 mm	<b>V872922-X</b>	158.00
.4094	10.400 mm	3.275	<b>83.20 mm</b>	<b>(8x)</b>	94.80 mm	1.89 mm	12 mm	150 mm	<b>V997876-X</b>	331.00
.4134	10.500 mm	1.240	<b>31.50 mm</b>	<b>(3x)</b>	40.59 mm	1.91 mm	12 mm	100 mm	<b>V804705-X</b>	136.00
.4134	10.500 mm	2.066	<b>52.50 mm</b>	<b>(5x)</b>	62.64 mm	1.91 mm	12 mm	125 mm	<b>V656863-X</b>	158.00
.4134	10.500 mm	3.307	<b>84.00 mm</b>	<b>(8x)</b>	95.71 mm	1.91 mm	12 mm	150 mm	<b>V959781-X</b>	331.00
.4173	10.600 mm	1.251	<b>31.80 mm</b>	<b>(3x)</b>	40.98 mm	1.93 mm	12 mm	100 mm	<b>V716473-X</b>	136.00
.4173	10.600 mm	2.086	<b>53.00 mm</b>	<b>(5x)</b>	63.24 mm	1.93 mm	12 mm	125 mm	<b>V931959-X</b>	158.00
.4173	10.600 mm	3.338	<b>84.80 mm</b>	<b>(8x)</b>	96.63 mm	1.93 mm	12 mm	150 mm	<b>V589985-X</b>	331.00
.4213	10.700 mm	1.263	<b>32.10 mm</b>	<b>(3x)</b>	41.36 mm	1.95 mm	12 mm	100 mm	<b>V967963-X</b>	136.00
.4213	10.700 mm	2.106	<b>53.50 mm</b>	<b>(5x)</b>	63.83 mm	1.95 mm	12 mm	125 mm	<b>V260341-X</b>	158.00
.4213	10.700 mm	3.370	<b>85.60 mm</b>	<b>(8x)</b>	97.54 mm	1.95 mm	12 mm	150 mm	<b>V317299-X</b>	331.00
.4219 (27/64)	10.716 mm	1.265	<b>32.15 mm</b>	<b>(3x)</b>	41.42 mm	1.95 mm	12 mm	100 mm	<b>V248338-X</b>	136.00
.4219 (27/64)	10.716 mm	2.110	<b>53.60 mm</b>	<b>(5x)</b>	63.93 mm	1.95 mm	12 mm	125 mm	<b>V184802-X</b>	158.00
.4219 (27/64)	10.716 mm	3.375	<b>85.75 mm</b>	<b>(8x)</b>	97.68 mm	1.95 mm	12 mm	150 mm	<b>V459907-X</b>	331.00
.4252	10.800 mm	1.275	<b>32.40 mm</b>	<b>(3x)</b>	41.75 mm	1.97 mm	12 mm	100 mm	<b>V602726-X</b>	136.00
.4252	10.800 mm	2.125	<b>54.00 mm</b>	<b>(5x)</b>	64.43 mm	1.97 mm	12 mm	125 mm	<b>V247731-X</b>	158.00
.4252	10.800 mm	3.401	<b>86.40 mm</b>	<b>(8x)</b>	98.45 mm	1.97 mm	12 mm	150 mm	<b>V195896-X</b>	331.00
.4291	10.900 mm	1.287	<b>32.70 mm</b>	<b>(3x)</b>	42.14 mm	1.98 mm	12 mm	100 mm	<b>V429098-X</b>	136.00
.4291	10.900 mm	2.145	<b>54.50 mm</b>	<b>(5x)</b>	65.03 mm	1.98 mm	12 mm	125 mm	<b>V561591-X</b>	158.00
.4291	10.900 mm	3.433	<b>87.20 mm</b>	<b>(8x)</b>	99.36 mm	1.98 mm	12 mm	175 mm	<b>V726450-X</b>	331.00
.4331	11.000 mm	1.299	<b>33.00 mm</b>	<b>(3x)</b>	42.52 mm	2.00 mm	12 mm	100 mm	<b>V661693-X</b>	136.00
.4331	11.000 mm	2.165	<b>55.00 mm</b>	<b>(5x)</b>	65.62 mm	2.00 mm	12 mm	125 mm	<b>V111557-X</b>	158.00
.4331	11.000 mm	3.464	<b>88.00 mm</b>	<b>(8x)</b>	100.27 mm	2.00 mm	12 mm	175 mm	<b>V731416-X</b>	331.00
.4370	11.100 mm	1.311	<b>33.30 mm</b>	<b>(3x)</b>	42.91 mm	2.02 mm	12 mm	100 mm	<b>V144905-X</b>	136.00
.4370	11.100 mm	2.185	<b>55.50 mm</b>	<b>(5x)</b>	66.22 mm	2.02 mm	12 mm	125 mm	<b>V529674-X</b>	158.00
.4370	11.100 mm	3.496	<b>88.80 mm</b>	<b>(8x)</b>	101.18 mm	2.02 mm	12 mm	175 mm	<b>V768753-X</b>	331.00
.4375 (7/16)	11.112 mm	1.312	<b>33.35 mm</b>	<b>(3x)</b>	42.95 mm	2.02 mm	12 mm	100 mm	<b>V538378-X</b>	136.00
.4375 (7/16)	11.112 mm	2.187	<b>55.55 mm</b>	<b>(5x)</b>	66.29 mm	2.02 mm	12 mm	125 mm	<b>V533490-X</b>	158.00
.4375 (7/16)	11.112 mm	3.499	<b>88.90 mm</b>	<b>(8x)</b>	101.29 mm	2.02 mm	12 mm	175 mm	<b>V652629-X</b>	331.00
.4409	11.200 mm	1.322	<b>33.60 mm</b>	<b>(3x)</b>	43.30 mm	2.04 mm	12 mm	100 mm	<b>V543531-X</b>	136.00
.4409	11.200 mm	2.204	<b>56.00 mm</b>	<b>(5x)</b>	66.82 mm	2.04 mm	12 mm	125 mm	<b>V266717-X</b>	158.00
.4409	11.200 mm	3.527	<b>89.60 mm</b>	<b>(8x)</b>	102.10 mm	2.04 mm	12 mm	175 mm	<b>V188910-X</b>	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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>T</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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.)

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 <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.4843	12.300 mm	1.452	<b>36.90 mm</b>	<b>(3x)</b>	47.55 mm	2.24 mm	14 mm	100 mm	<b>V771146-X</b>	184.00
.4843	12.300 mm	2.421	<b>61.50 mm</b>	<b>(5x)</b>	73.38 mm	2.24 mm	14 mm	125 mm	<b>V286389-X</b>	214.00
.4843	12.300 mm	3.874	<b>98.40 mm</b>	<b>(8x)</b>	112.12 mm	2.24 mm	14 mm	175 mm	<b>V673379-X</b>	352.00
.4882 (31/64)	12.400 mm	1.464	<b>37.20 mm</b>	<b>(3x)</b>	47.93 mm	2.26 mm	14 mm	100 mm	<b>V790461-X</b>	184.00
.4882 (31/64)	12.400 mm	2.440	<b>62.00 mm</b>	<b>(5x)</b>	73.97 mm	2.26 mm	14 mm	125 mm	<b>V930755-X</b>	214.00
.4882 (31/64)	12.400 mm	3.905	<b>99.20 mm</b>	<b>(8x)</b>	113.03 mm	2.26 mm	14 mm	175 mm	<b>V997694-X</b>	352.00
.4921	12.500 mm	1.476	<b>37.50 mm</b>	<b>(3x)</b>	48.32 mm	2.27 mm	14 mm	100 mm	<b>V202412-X</b>	184.00
.4921	12.500 mm	2.460	<b>62.50 mm</b>	<b>(5x)</b>	74.57 mm	2.27 mm	14 mm	125 mm	<b>V131343-X</b>	214.00
.4921	12.500 mm	3.937	<b>100.00 mm</b>	<b>(8x)</b>	113.95 mm	2.27 mm	14 mm	175 mm	<b>V668048-X</b>	352.00
.4961	12.600 mm	1.488	<b>37.80 mm</b>	<b>(3x)</b>	48.71 mm	2.29 mm	14 mm	100 mm	<b>V369910-X</b>	184.00
.4961	12.600 mm	2.480	<b>63.00 mm</b>	<b>(5x)</b>	75.17 mm	2.29 mm	14 mm	125 mm	<b>V981463-X</b>	214.00
.4961	12.600 mm	3.968	<b>100.80 mm</b>	<b>(8x)</b>	114.86 mm	2.29 mm	14 mm	175 mm	<b>V682916-X</b>	352.00
.5000 (1/2)	12.700 mm	1.499	<b>38.10 mm</b>	<b>(3x)</b>	49.09 mm	2.31 mm	14 mm	100 mm	<b>V608930-X</b>	184.00
.5000 (1/2)	12.700 mm	2.499	<b>63.50 mm</b>	<b>(5x)</b>	75.76 mm	2.31 mm	14 mm	125 mm	<b>V915134-X</b>	214.00
.5000 (1/2)	12.700 mm	3.999	<b>101.60 mm</b>	<b>(8x)</b>	115.77 mm	2.31 mm	14 mm	175 mm	<b>V703694-X</b>	352.00

\* For h6 and h8 tolerances, see page 8.



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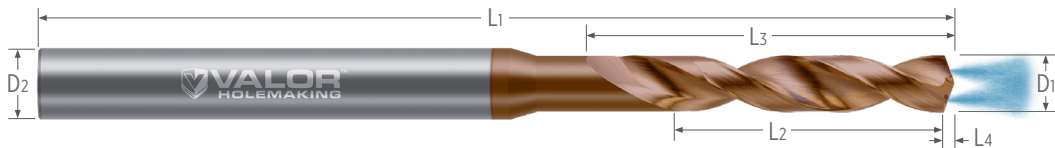
Double margin design for increased stability

# High Performance Drills

## For Steels – Coolant-Through

### Unbeatable Performance When Coolant-Through Drilling 4140 Steel

- Optimized for best-in-class performance in 4140 Steel with superior performance in a wide variety of Steels and other Alloy Steels
- 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

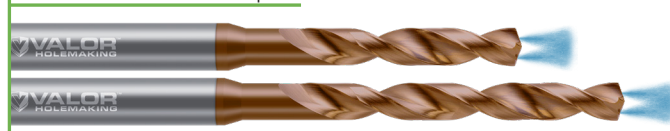


Drill Diameter		Max Drill Depth			Flute Length	Point Angle Length	Shank Dia.	Overall Length	Val-Max X Coated	
inch	metric	inch	metric	hole depth						
D1 (h8)*		L2			L3	L4	D2 (h6)*	L1	Tool #	Price
.0625 (1/16)	1.587 mm	.312	7.95 mm	(5x)	9.46 mm	.29 mm	3 mm	63 mm	V189491-X	104.50
.0625 (1/16)	1.587 mm	.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.

continued on next page

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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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.)

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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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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# 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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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# 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						
Di (h8)*		L2			L3	L4	D2 (h6)*	L1	Tool #	Price
.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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# 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.3110	7.900 mm	1.555	<b>39.50 mm</b>	<b>(5x)</b>	47.13 mm	1.44 mm	8 mm	100 mm	<b>V880723-X</b>	145.00
.3110	7.900 mm	2.488	<b>63.20 mm</b>	<b>(8x)</b>	72.01 mm	1.44 mm	8 mm	125 mm	<b>V592896-X</b>	215.00
.3125 (5/16)	7.937 mm	1.562	<b>39.70 mm</b>	<b>(5x)</b>	47.35 mm	1.44 mm	8 mm	100 mm	<b>V227077-X</b>	145.00
.3125 (5/16)	7.937 mm	2.499	<b>63.50 mm</b>	<b>(8x)</b>	72.35 mm	1.44 mm	8 mm	125 mm	<b>V284014-X</b>	215.00
.3150	8.000 mm	1.574	<b>40.00 mm</b>	<b>(5x)</b>	47.72 mm	1.46 mm	10 mm	100 mm	<b>V793102-X</b>	145.00
.3150	8.000 mm	2.519	<b>64.00 mm</b>	<b>(8x)</b>	72.92 mm	1.46 mm	10 mm	125 mm	<b>V543490-X</b>	215.00
.3189	8.100 mm	1.594	<b>40.50 mm</b>	<b>(5x)</b>	48.32 mm	1.47 mm	10 mm	100 mm	<b>V794819-X</b>	176.00
.3189	8.100 mm	2.551	<b>64.80 mm</b>	<b>(8x)</b>	73.84 mm	1.47 mm	10 mm	125 mm	<b>V558544-X</b>	257.50
.3228	8.200 mm	1.614	<b>41.00 mm</b>	<b>(5x)</b>	48.92 mm	1.49 mm	10 mm	100 mm	<b>V224541-X</b>	176.00
.3228	8.200 mm	2.582	<b>65.60 mm</b>	<b>(8x)</b>	74.75 mm	1.49 mm	10 mm	125 mm	<b>V791173-X</b>	257.50
.3268	8.300 mm	1.633	<b>41.50 mm</b>	<b>(5x)</b>	49.51 mm	1.51 mm	10 mm	100 mm	<b>V846287-X</b>	176.00
.3268	8.300 mm	2.614	<b>66.40 mm</b>	<b>(8x)</b>	75.66 mm	1.51 mm	10 mm	125 mm	<b>V847161-X</b>	257.50
.3281 (21/64)	8.333 mm	1.639	<b>41.65 mm</b>	<b>(5x)</b>	49.71 mm	1.52 mm	10 mm	100 mm	<b>V132654-X</b>	176.00
.3281 (21/64)	8.333 mm	2.624	<b>66.65 mm</b>	<b>(8x)</b>	75.96 mm	1.52 mm	10 mm	125 mm	<b>V837883-X</b>	257.50
.3307	8.400 mm	1.653	<b>42.00 mm</b>	<b>(5x)</b>	50.11 mm	1.53 mm	10 mm	100 mm	<b>V800950-X</b>	176.00
.3307	8.400 mm	2.645	<b>67.20 mm</b>	<b>(8x)</b>	76.57 mm	1.53 mm	10 mm	125 mm	<b>V429782-X</b>	257.50
.3346	8.500 mm	1.673	<b>42.50 mm</b>	<b>(5x)</b>	50.71 mm	1.55 mm	10 mm	100 mm	<b>V629626-X</b>	176.00
.3346	8.500 mm	2.677	<b>68.00 mm</b>	<b>(8x)</b>	77.48 mm	1.55 mm	10 mm	125 mm	<b>V365117-X</b>	257.50
.3386	8.600 mm	1.692	<b>43.00 mm</b>	<b>(5x)</b>	51.30 mm	1.57 mm	10 mm	100 mm	<b>V934750-X</b>	176.00
.3386	8.600 mm	2.708	<b>68.80 mm</b>	<b>(8x)</b>	78.39 mm	1.57 mm	10 mm	125 mm	<b>V672857-X</b>	257.50
.3425	8.700 mm	1.712	<b>43.50 mm</b>	<b>(5x)</b>	51.90 mm	1.58 mm	10 mm	100 mm	<b>V535214-X</b>	176.00
.3425	8.700 mm	2.740	<b>69.60 mm</b>	<b>(8x)</b>	79.30 mm	1.58 mm	10 mm	125 mm	<b>V724736-X</b>	257.50
.3438 (11/32)	8.732 mm	1.718	<b>43.65 mm</b>	<b>(5x)</b>	52.09 mm	1.59 mm	10 mm	100 mm	<b>V188406-X</b>	176.00
.3438 (11/32)	8.732 mm	2.749	<b>69.85 mm</b>	<b>(8x)</b>	79.60 mm	1.59 mm	10 mm	125 mm	<b>V365910-X</b>	257.50
.3465	8.800 mm	1.732	<b>44.00 mm</b>	<b>(5x)</b>	52.50 mm	1.60 mm	10 mm	100 mm	<b>V293144-X</b>	176.00
.3465	8.800 mm	2.771	<b>70.40 mm</b>	<b>(8x)</b>	80.22 mm	1.60 mm	10 mm	125 mm	<b>V817884-X</b>	257.50
.3504	8.900 mm	1.751	<b>44.50 mm</b>	<b>(5x)</b>	53.09 mm	1.62 mm	10 mm	100 mm	<b>V818572-X</b>	176.00
.3504	8.900 mm	2.803	<b>71.20 mm</b>	<b>(8x)</b>	81.13 mm	1.62 mm	10 mm	150 mm	<b>V648679-X</b>	257.50
.3543	9.000 mm	1.771	<b>45.00 mm</b>	<b>(5x)</b>	53.69 mm	1.64 mm	10 mm	100 mm	<b>V936127-X</b>	176.00
.3543	9.000 mm	2.834	<b>72.00 mm</b>	<b>(8x)</b>	82.04 mm	1.64 mm	10 mm	150 mm	<b>V150387-X</b>	257.50
.3583	9.100 mm	1.791	<b>45.50 mm</b>	<b>(5x)</b>	54.29 mm	1.66 mm	10 mm	100 mm	<b>V347102-X</b>	176.00
.3583	9.100 mm	2.866	<b>72.80 mm</b>	<b>(8x)</b>	82.95 mm	1.66 mm	10 mm	150 mm	<b>V201118-X</b>	257.50
.3594 (23/64)	9.128 mm	1.797	<b>45.65 mm</b>	<b>(5x)</b>	54.45 mm	1.66 mm	10 mm	100 mm	<b>V859797-X</b>	176.00
.3594 (23/64)	9.128 mm	2.874	<b>73.00 mm</b>	<b>(8x)</b>	83.21 mm	1.66 mm	10 mm	150 mm	<b>V984555-X</b>	257.50
.3622	9.200 mm	1.811	<b>46.00 mm</b>	<b>(5x)</b>	54.88 mm	1.67 mm	10 mm	100 mm	<b>V317969-X</b>	176.00
.3622	9.200 mm	2.897	<b>73.60 mm</b>	<b>(8x)</b>	83.86 mm	1.67 mm	10 mm	150 mm	<b>V217215-X</b>	257.50

\* 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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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## 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	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.

continued on next page



## 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	L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
D <sub>1</sub> (h8)*		L <sub>2</sub>			L <sub>3</sub>	L <sub>4</sub>	D <sub>2</sub> (h6)*	L <sub>1</sub>	Tool #	Price
.4764	12.100 mm	2.381	<b>60.50 mm</b>	<b>(5x)</b>	72.18 mm	2.20 mm	14 mm	125 mm	<b>V165416-X</b>	321.00
.4764	12.100 mm	3.811	<b>96.80 mm</b>	<b>(8x)</b>	110.30 mm	2.20 mm	14 mm	175 mm	<b>V611187-X</b>	353.00
.4803	12.200 mm	2.401	<b>61.00 mm</b>	<b>(5x)</b>	72.78 mm	2.22 mm	14 mm	125 mm	<b>V499243-X</b>	321.00
.4803	12.200 mm	3.842	<b>97.60 mm</b>	<b>(8x)</b>	111.21 mm	2.22 mm	14 mm	175 mm	<b>V556731-X</b>	353.00
.4843	12.300 mm	2.421	<b>61.50 mm</b>	<b>(5x)</b>	73.38 mm	2.24 mm	14 mm	125 mm	<b>V606643-X</b>	321.00
.4843	12.300 mm	3.874	<b>98.40 mm</b>	<b>(8x)</b>	112.12 mm	2.24 mm	14 mm	175 mm	<b>V449949-X</b>	353.00
.4882 (31/64)	12.400 mm	2.440	<b>62.00 mm</b>	<b>(5x)</b>	73.97 mm	2.26 mm	14 mm	125 mm	<b>V619843-X</b>	321.00
.4882 (31/64)	12.400 mm	3.905	<b>99.20 mm</b>	<b>(8x)</b>	113.03 mm	2.26 mm	14 mm	175 mm	<b>V558340-X</b>	353.00
.4921	12.500 mm	2.460	<b>62.50 mm</b>	<b>(5x)</b>	74.57 mm	2.27 mm	14 mm	125 mm	<b>V436056-X</b>	321.00
.4921	12.500 mm	3.937	<b>100.00 mm</b>	<b>(8x)</b>	113.95 mm	2.27 mm	14 mm	175 mm	<b>V744710-X</b>	353.00
.4961	12.600 mm	2.480	<b>63.00 mm</b>	<b>(5x)</b>	75.17 mm	2.29 mm	14 mm	125 mm	<b>V509952-X</b>	321.00
.4961	12.600 mm	3.968	<b>100.80 mm</b>	<b>(8x)</b>	114.86 mm	2.29 mm	14 mm	175 mm	<b>V520602-X</b>	353.00
.5000 (1/2)	12.700 mm	2.499	<b>63.50 mm</b>	<b>(5x)</b>	75.76 mm	2.31 mm	14 mm	125 mm	<b>V838117-X</b>	321.00
.5000 (1/2)	12.700 mm	3.999	<b>101.60 mm</b>	<b>(8x)</b>	115.77 mm	2.31 mm	14 mm	175 mm	<b>V188335-X</b>	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](http://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 Holesmaking 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](mailto:Valortech@harveyperformance.com).





# Combined Drill & Countersinks



Val-Max X coated for superior performance

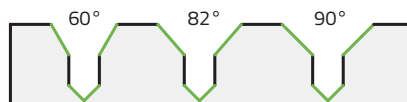
## Excellent Choice for Predrilling Applications

- 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	
						Tool #	Price	Tool #	Price
A <sup>+1°</sup> / <sub>-1°</sub>		D1 <sup>+0.015"</sup> / <sub>+0.005"</sub>	L2 <sup>+0.05"</sup> / <sub>-0.000"</sub>	D2	L1				
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

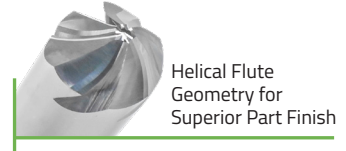
Stocked in three included angles





# High Performance Chamfer Cutters

## Helically Fluted



### Outstanding in High Performance Countersinking Applications

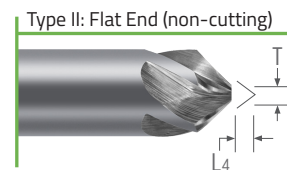
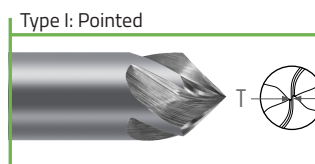
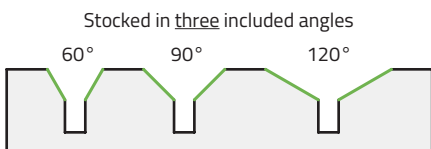
- Optimized for countersinking and chamfering operations while providing excellent performance in deburring applications
- Free cutting action design provides excellent surface finish and chip evacuation
- Engineered with a specialized helical flute design for superior performance
- Offered in Type I 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	
					L2	L4 (Max.)		Tool #	Price	Tool #	Price
60°	1/8	2	.010	I	.100		1-1/2	V303773	23.20	V303773-X	30.00
		3	.040	II	.074	.036	1-1/2	V672817	23.70	V672817-X	30.50
		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	.050	II	.119	.045	2	V337326	32.00	V337326-X	39.60
		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
		3	.060	II	.164	.054	2-1/2	V209624	37.00	V209624-X	46.80
		4	.010	I	.208		2-1/2	V712592	41.70	V712592-X	51.50
	3/8	2	.010	I	.316		2-1/2	V313911	52.80	V313911-X	66.80
		3	.070	II	.264	.062	2-1/2	V124536	49.60	V124536-X	63.60
		4	.010	I	.316		2-1/2	V164693	52.80	V164693-X	66.80
	5	.070	II	.264	.062	2-1/2	V631112	49.60	V631112-X	63.60	

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

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# High Performance Chamfer Cutters

## Helically Fluted (cont.)

continued from previous page

Included Angle	Diameter	Flutes	Tip	Type	Length of Cut			Uncoated		Val-Max X Coated		
					L <sub>2</sub>	L <sub>4 (Max.)</sub>	L <sub>1</sub>	Tool #	Price	Tool #	Price	
60°	1/2	2	.010	I	.424		3	V419548	74.10	V419548-X	93.00	
		3	.080	II	.364	.071	3	V660602	69.50	V660602-X	88.50	
		4	.010	I	.424		3	V349044	74.10	V349044-X	93.00	
		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	
		3	.040	II	.043	.021	1-1/2	V200401	23.20	V200401-X	30.00	
		4	.010	I	.058		1-1/2	V786295	25.60	V786295-X	32.40	
		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	.050	II	.069	.026	2	V811095	31.30	V811095-X	39.00	
		4	.010	I	.089		2	V622369	33.40	V622369-X	41.00	
		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	
		3	.060	II	.095	.031	2-1/2	V280810	37.00	V280810-X	46.80	
		4	.010	I	.120		2-1/2	V958539	41.70	V958539-X	51.50	
		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	.070	II	.153	.036	2-1/2	V345394	49.60	V345394-X	63.60
			4	.010	I	.183		2-1/2	V236486	52.80	V236486-X	66.80
			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	
		3	.080	II	.210	.041	3	V966684	69.50	V966684-X	88.50	
4		.010	I	.245		3	V800918	74.10	V800918-X	93.00		
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	
		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	
		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	
		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"





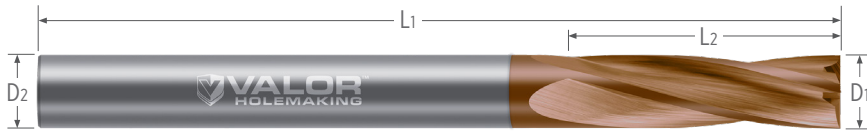
# Counterbores

## Flat Bottom



### 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

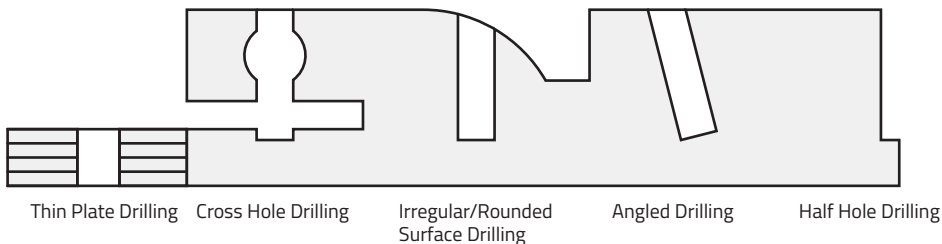


Cutter Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
				Tool #	Price	Tool #	Price
D1 <sup>+0.000*</sup> / <sub>-0.005</sub>	L2 <sup>+0.030"</sup> / <sub>-0.000"</sub>	D2	L1				
.0625 (1/16)	1/4	1/8	1-1/2	<b>V695306</b>	50.40	<b>V695306-X</b>	57.20
.0781 (5/64)	5/16	1/8	1-1/2	<b>V778476</b>	50.40	<b>V778476-X</b>	57.20
.0787 (2 mm)	5/16	1/8	1-1/2	<b>V408316</b>	50.40	<b>V408316-X</b>	57.20
.0937 (3/32)	3/8	1/8	1-1/2	<b>V892625</b>	50.40	<b>V892625-X</b>	57.20
.1094 (7/64)	3/8	1/8	1-1/2	<b>V745187</b>	50.40	<b>V745187-X</b>	57.20
.1181 (3 mm)	3/8	1/8	1-1/2	<b>V939405</b>	50.40	<b>V939405-X</b>	57.20
.1250 (1/8)	1/2	1/8	1-1/2	<b>V527625</b>	50.40	<b>V527625-X</b>	57.20
.1406 (9/64)	9/16	3/16	2	<b>V783531</b>	48.20	<b>V783531-X</b>	55.90
.1562 (5/32)	5/8	3/16	2	<b>V321622</b>	48.20	<b>V321622-X</b>	55.90
.1575 (4 mm)	5/8	3/16	2	<b>V372376</b>	48.20	<b>V372376-X</b>	55.90
.1719 (11/64)	5/8	3/16	2	<b>V508715</b>	48.20	<b>V508715-X</b>	55.90
.1875 (3/16)	3/4	3/16	2	<b>V370840</b>	48.20	<b>V370840-X</b>	55.90
.1968 (5 mm)	3/4	1/4	2-1/2	<b>V699368</b>	65.90	<b>V699368-X</b>	75.70

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

continued on next page

### Flat Bottom Counterbore Applications





# Counterbores

## Flat Bottom (cont.)

continued from previous page

Cutter Diameter	Flute Length	Shank Diameter	Overall Length	Uncoated		Val-Max X Coated	
				Tool #	Price	Tool #	Price
D1 <sup>+0.0000*</sup> -0.0005	L2 <sup>+0.030"</sup> -0.000"	D2	L1				
.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.





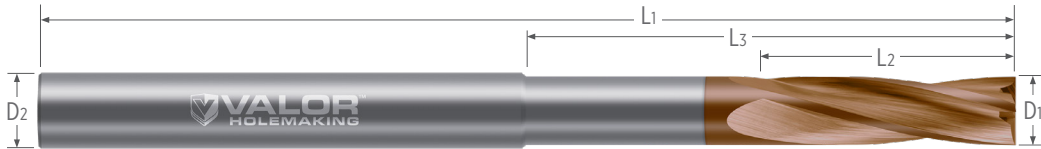
# Counterbores

## Flat Bottom - Long Reach



### Unmatched Precision in Long Reach Counterboring Applications

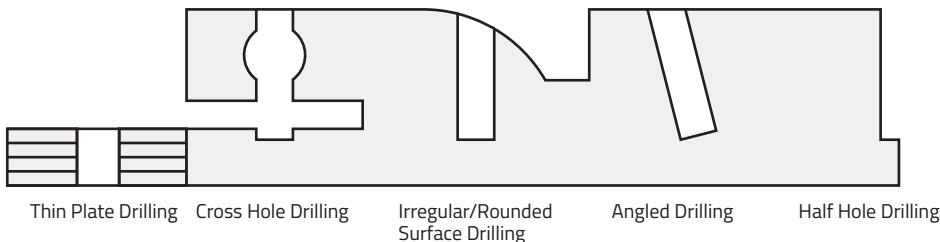
- Engineered with an undersized neck to avoid heeling
- Flat bottom design (no dish) allows for spot facing or counterboring on irregular surfaces commonly found on rounded or complex parts
- Provides excellent performance when flat bottom reaming or straightening misaligned holes
- Ground with full 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	
					Tool #	Price	Tool #	Price
$D_1^{+.0000*}_{-.0005}$	$L_2^{+.030}_{-.000}$	$L_3^{+.030}_{-.000}$	$D_2$	$L_1$	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"

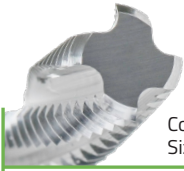
### Flat Bottom Counterbore Applications





# Thread Mills

## Multi-Form – UN Threads



Common Thread Sizes Available

- 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

### Amazingly Versatile in Right & Left Hand Thread Milling

- 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 D1 <sup>+0.0005</sup> <sub>-0.0005</sub>	Length of Cut L2	Flutes	Shank Diameter D2	Overall Length L1	Uncoated		Val-Max X Coated	
						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

Download Speeds & Feeds Charts for Every Val-Holemaking Tool  
[valorholemaking.com/resources/speeds-feeds](http://valorholemaking.com/resources/speeds-feeds)



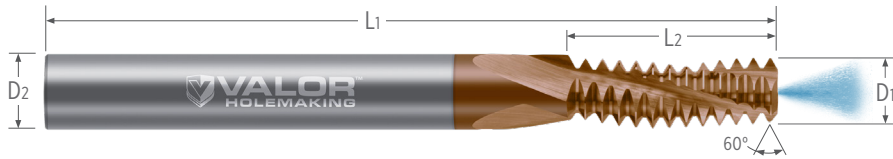
# Thread Mills

## Multi-Form - UN Threads - Coolant-Through



### 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 D1 <sup>+0.000</sup> <sub>-0.002</sub>	Length of Cut L2	Flutes	Shank Diameter D2	Overall Length L1	Uncoated		Val-Max X Coated	
						Tool #	Price	Tool #	Price
10-24	.145	.312	3	3/16	2-3/8	<b>V396731</b>	147.20	<b>V396731-X</b>	155.30
10-32	.150	.312	3	3/16	2-3/8	<b>V889790</b>	147.20	<b>V889790-X</b>	155.30
1/4-20	.180	.500	3	3/16	2-3/8	<b>V656064</b>	176.80	<b>V656064-X</b>	185.00
1/4-28	.180	.500	3	3/16	2-3/8	<b>V989312</b>	176.80	<b>V989312-X</b>	185.00
5/16-18	.235	.625	3	1/4	2-3/8	<b>V843484</b>	190.50	<b>V843484-X</b>	200.30
5/16-24	.235	.625	3	1/4	2-3/8	<b>V722664</b>	222.50	<b>V722664-X</b>	232.30
3/8-16	.285	.750	4	5/16	3	<b>V720638</b>	256.90	<b>V720638-X</b>	268.60
3/8-24	.285	.750	4	5/16	3	<b>V756737</b>	256.90	<b>V756737-X</b>	268.60
7/16-14	.305	.750	4	5/16	3	<b>V217976</b>	256.90	<b>V217976-X</b>	268.60
7/16-20	.335	.875	4	3/8	3	<b>V454378</b>	276.70	<b>V454378-X</b>	290.60
1/2-13	.350	.875	4	3/8	3	<b>V492881</b>	285.50	<b>V492881-X</b>	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

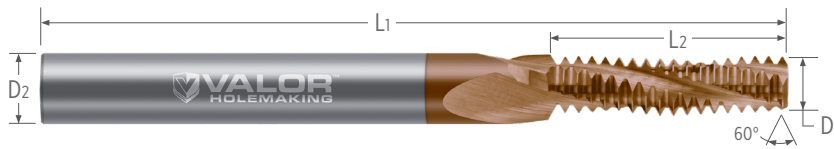
## Multi-Form – UN Threads – Long Flute



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



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

[valorholemaking.com/resources/simulation-files](http://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 $D_1^{+0.0005}_{-0.0005}$	Length of Cut $L_2$	Flutes	Shank Diameter $D_2$	Overall Length $L_1$	Uncoated		Val-Max X Coated	
						Tool #	Price	Tool #	Price
M3-0.50	.085	.178	3	1/8	2	<b>V705769</b>	131.80	<b>V705769-X</b>	138.60
M4-0.70	.115	.276	3	1/8	2	<b>V221421</b>	131.80	<b>V221421-X</b>	138.60
M4.5-0.75	.120	.250	3	1/8	2	<b>V751646</b>	131.80	<b>V751646-X</b>	138.60
M5-0.80	.120	.312	3	1/8	2	<b>V520089</b>	131.80	<b>V520089-X</b>	138.60
M6-1.00	.170	.500	3	3/16	2-1/2	<b>V411343</b>	160.00	<b>V411343-X</b>	168.20
M8-1.25	.235	.625	3	1/4	2-1/2	<b>V689550</b>	172.00	<b>V689550-X</b>	181.80
M10-1.50	.300	.750	4	5/16	3	<b>V473531</b>	232.00	<b>V473531-X</b>	243.80
M12-1.75	.360	.875	4	3/8	3-1/2	<b>V550418</b>	258.20	<b>V550418-X</b>	273.10
M14-1.50	.370	.875	4	3/8	3-1/2	<b>V956048</b>	258.20	<b>V956048-X</b>	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

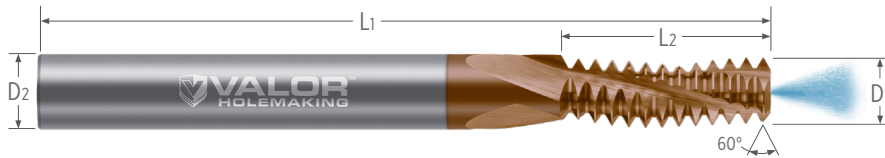


Single Coolant-Through Channel Design

- 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

### Maximum Chip Ejection in Blind Hole Applications

- 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 $D_1^{+0.000}_{-0.002}$	Length of Cut $L_2$	Flutes	Shank Diameter $D_2$	Overall Length $L_1$	Uncoated		Val-Max X Coated	
						Tool #	Price	Tool #	Price
M3-0.50	.085	.1780	3	1/8	2	<b>V757297</b>	151.60	<b>V757297-X</b>	158.40
M4-0.70	.115	.2760	3	1/8	2	<b>V954960</b>	151.60	<b>V954960-X</b>	158.40
M5-0.80	.120	.3125	3	1/8	2	<b>V490771</b>	151.60	<b>V490771-X</b>	158.40
M6-1.00	.170	.5000	3	3/16	2-1/2	<b>V875636</b>	184.20	<b>V875636-X</b>	192.30
M8-1.25	.235	.6250	3	1/4	2-1/2	<b>V388421</b>	197.90	<b>V388421-X</b>	207.70

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[valorholemaking.com/resources/speeds-feeds](http://valorholemaking.com/resources/speeds-feeds)



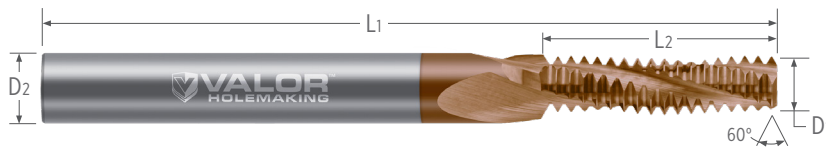
# Thread Mills

## Multi-Form – Metric Threads – Long Flute



### 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 D1 <sup>+0.0005</sup> <sub>-0.0005</sub>	Length of Cut L2	Flutes	Shank Diameter D2	Overall Length L1	Uncoated		Val-Max X Coated	
						Tool #	Price	Tool #	Price
M3-0.50	.090	.276	3	1/8	2	<b>V837004</b>	169.60	<b>V837004-X</b>	176.40
M4-0.70	.124	.441	3	3/16	2-1/2	<b>V503448</b>	173.80	<b>V503448-X</b>	182.00
M5-0.80	.155	.504	3	3/16	2-1/2	<b>V256903</b>	173.80	<b>V256903-X</b>	182.00
M6-1.00	.186	.748	3	1/4	2-1/2	<b>V790009</b>	201.30	<b>V790009-X</b>	211.10
M8-1.25	.245	.984	3	5/16	2-1/2	<b>V659859</b>	258.90	<b>V659859-X</b>	270.60
M10-1.50	.311	1.122	4	3/8	3-1/2	<b>V975146</b>	325.00	<b>V975146-X</b>	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 $D_1^{+0.0005}_{-0.0005}$	Length of Cut $L_2$	Flutes	Shank Diameter $D_2$	Overall Length $L_1$	Uncoated		Val-Max X Coated	
						Tool #	Price	Tool #	Price
1/16, 1/8-27	.245	.437	3	1/4	2-1/2	<b>V614054</b>	163.50	<b>V614054-X</b>	173.30
1/4, 3/8-18	.305	.625	4	5/16	3	<b>V897256</b>	224.10	<b>V897256-X</b>	235.90
1/4, 3/8-18	.363	.680	4	3/8	3-1/2	<b>V224635</b>	238.40	<b>V224635-X</b>	253.40
1/2, 3/4-14	.495	.875	4	1/2	3-1/2	<b>V641508</b>	261.50	<b>V641508-X</b>	281.80
1, 2-11.5	.620	1.125	4	5/8	4	<b>V175728</b>	369.80	<b>V175728-X</b>	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	
						Tool #	Price	Tool #	Price
	$D_1^{+0.0005}_{-0.0005}$	$L_2$		$D_2$	$L_1$				
1/16, 1/8-27	.245	.437	3	1/4	2-1/2	<b>V284224</b>	191.00	<b>V284224-X</b>	200.80
1/4, 3/8-18	.305	.625	4	5/16	3	<b>V169267</b>	228.10	<b>V169267-X</b>	239.90
1/2, 3/4-14	.495	.875	4	1/2	3-1/2	<b>V683311</b>	296.10	<b>V683311-X</b>	316.40
1, 2-11.5	.620	1.125	4	5/8	4	<b>V633813</b>	440.70	<b>V633813-X</b>	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

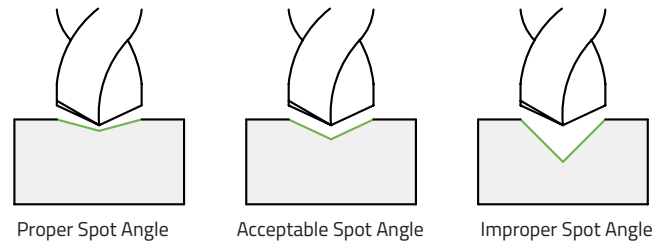
## Properly Select a Valor Holesmaking High Performance Spotting Drill

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

### Choosing a High Performance Spotting Drill

#### Point Angle

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



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

#### Drill Diameter

Valor Holesmaking 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 Holesmaking 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 Holesmaking 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 Holesmaking 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	-	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			FORM TAPS - Target Theor. % of Thread		
	-55%	-65%	-75%	-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	15.50 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

- = approximately

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

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

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

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

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

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

### 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

$$\text{SFM} = 0.26 \times \text{RPM} \times \text{Dia. in}$$

$$\text{IPM} = \text{No. of teeth} \times \text{IPT} \times \text{RPM}$$

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

$$\text{Q} = \text{Depth of Cut in.} \times \text{Width of Cut in.}$$

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

### Drill Equations

$$\text{IPM} = \text{IPR} \times \text{R}$$

$$\text{SFM} = 0.26 \times \text{RPM} \times \text{Dia. in} \qquad \text{RPM} = \frac{\text{SFM}}{\text{Dia. in}} \times 3.82$$

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

### Conversions

$$\text{Inch} = \frac{\text{mm}}{25.4} \qquad \text{Gal} = \frac{\text{Liter}}{3.79} \qquad \text{PSI} = \text{Bar} \times 14.7$$

$$\text{SFM} = \text{m/min.} \times 3.28 \qquad \text{IPR} = \frac{\text{mm/rev.}}{25.4} \qquad \text{Torque} = \text{NM} \times 0.7376$$

$$\text{HP} = \text{KW} \times 1.34$$

### Equation Key

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





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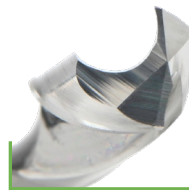
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# Reconditioning Program

(cont.)

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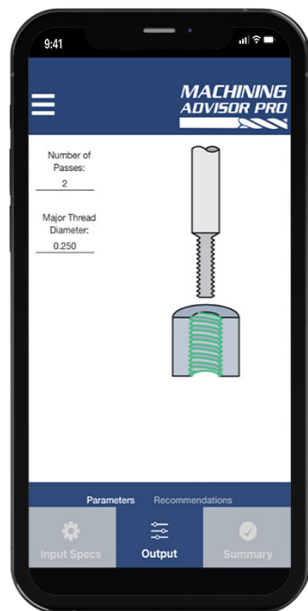
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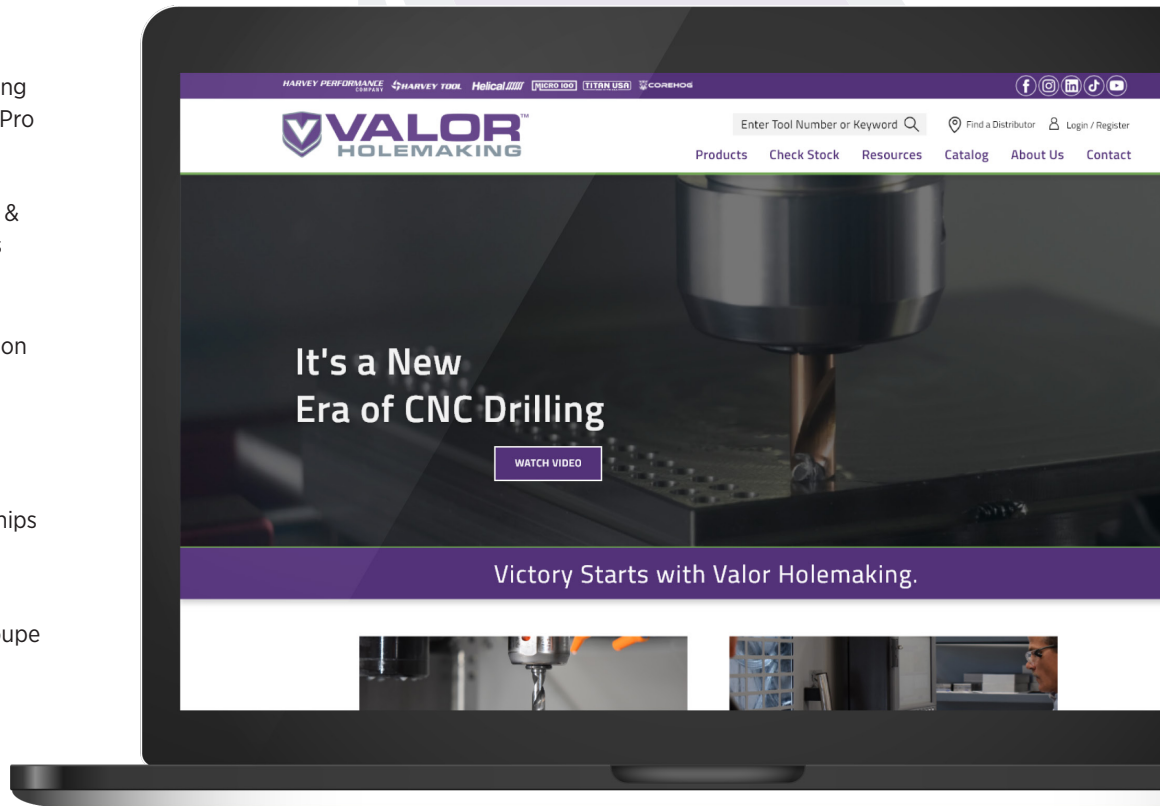
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