MITSUBISHI MATERIALS

MHS

WSTAR Drill Series

SOLID CARBIDE DRILL FOR
DIE & MOLD MACHINING



TOOL NEWS **B137A**

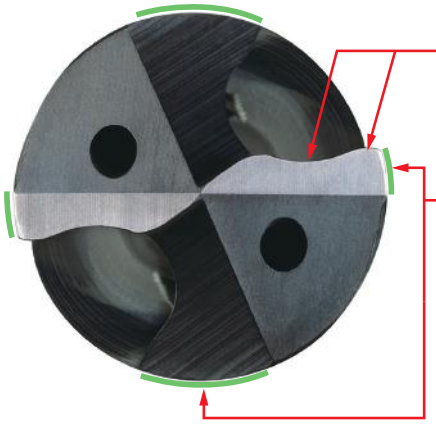
Solid Carbide Drill for Die & Mold Machining

WSTAR DRILL SERIES

MHS

■ Features

Stable machining for the unique cutting edge geometry & double margin flute



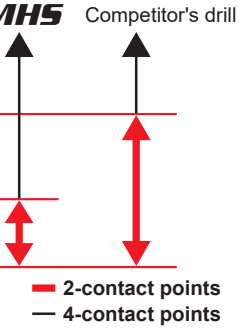
Wavy cutting edge

The wave edge design achieves a sharp peripheral edge cutting performance with a strong initial cutting point near the centre.

Double margin

Unique guide pads add stability by providing 4 contact points. This enables a reduction in drilling time.





Strong geometry for stable machining of molds



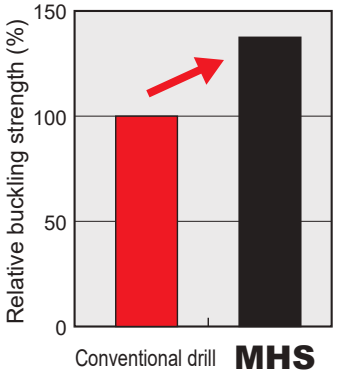
Web thickness

In comparison with conventional drills a larger web thickness is used to increase overall rigidity.

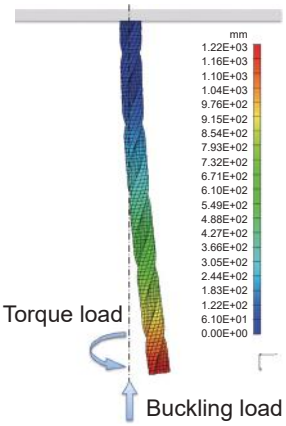


Helix angle

In comparison with conventional drills, lower helix angle is used to maintain cutting edge strength.



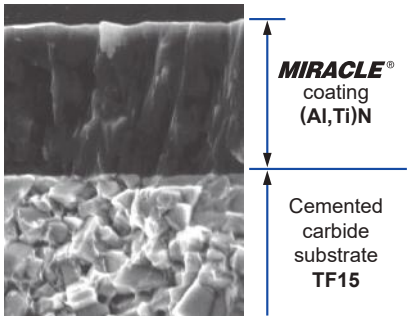
Higher rigidity with a 37% increase in buckling strength.(Compared to other Mitsubishi Materials drills)



Refraction strength is the resistance against deflection when a load is added against the rotational axis direction.

Tough carbide grade

● Long tool life ***MIRACLE***® coated **VP15TF**



VP15TF

MIRACLE® Coated

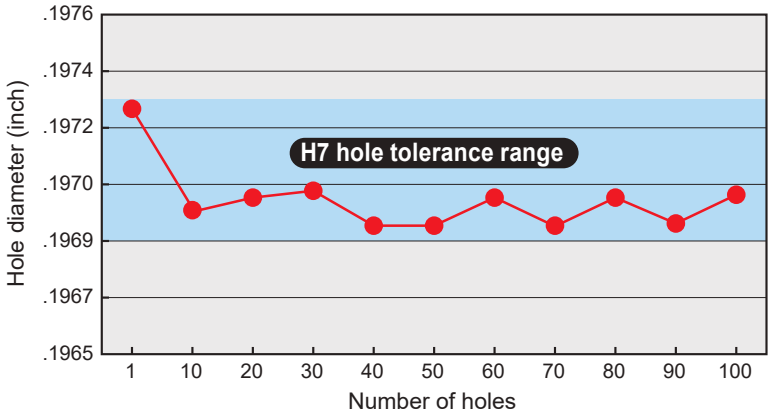
Features of VP15TF

Miracle coated VP15TF is suitable for machining of 35–55HRC mold materials.

Cutting Performance

High precision (oversize) (48–50HRC)

● **Unique geometry specially designed for die & mold machining provides superior hole accuracy!**

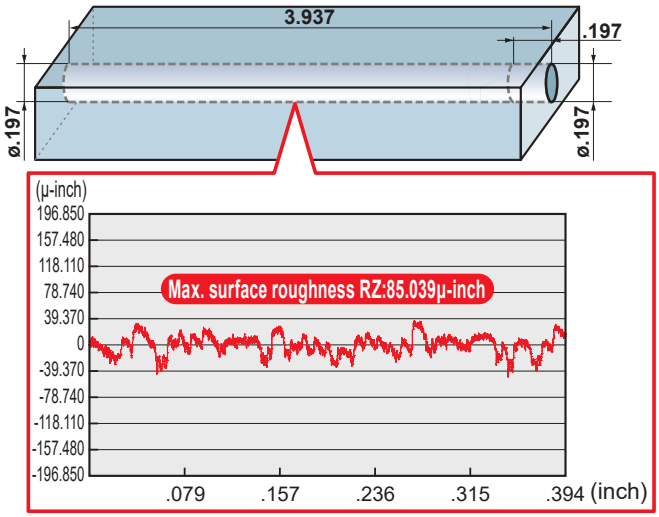


<Cutting conditions>
Workpiece : DH31S (Alloy tool steel)
Hardness : 48–50HRC
Drill : MHS0500L090B (ø.1969 inch)
Hole depth : 2.756 inch
Cutting speed : 66 SFM
Feed : .006 IPR (continuous)
Feed Rate : 7.5 IPM
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0500L020B (ø.1969 inch)
Hole depth : .1969 inch
Cutting speed : 66 SFM
Feed : .006 IPR

High precision (surface roughness) (48–50HRC)

● **Unique geometry specially designed for die & mold machining allows for high quality holes!**

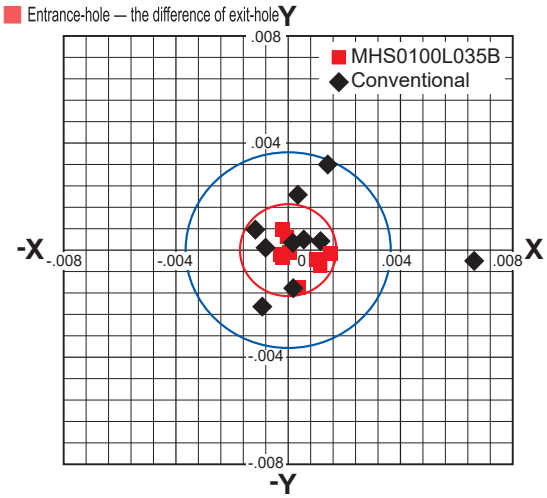


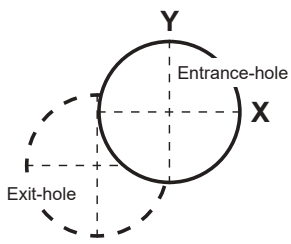
<Cutting conditions>
Workpiece : JIS SKD11
Hardness : 48–50HRC
Drill : MHS0500L120B (ø.1969 inch)
Hole depth : 3.937 inch (Through hole)
Cutting speed : 66 SFM
Feed : .004 IPR (continuous)
Feed Rate : 5.0 IPM
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0500L020B (ø.1969 inch)
Hole depth : .1969 inch
Cutting speed : 66 SFM
Feed : .004 IPR

High positional accuracy

● **MHS drills give high positional accuracy on through holes.**





Analysis of entrance and exit positions shows that MHS drills give highly accurate, straight holes.

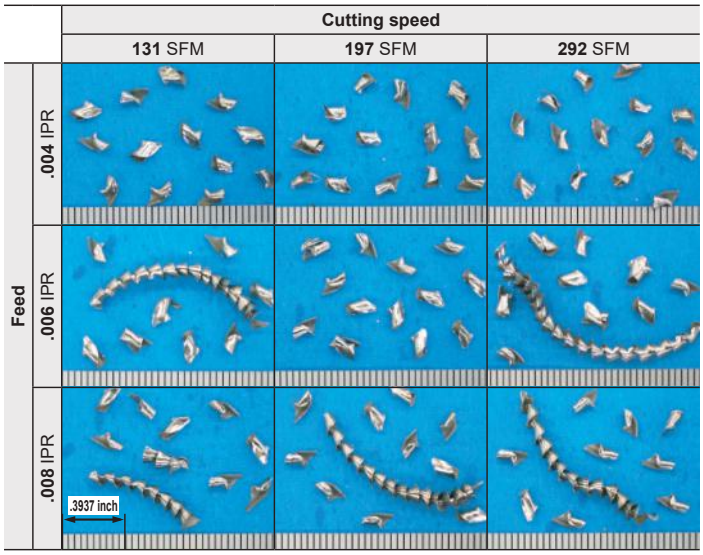
<Cutting conditions>
Workpiece : SKD11
Hardness : 17HRC
Drill : MHS0100L035B
(ø.0394 inch × Flute length .378 inch)
Hole depth : .984 inch (Through hole)
Cutting speed : 1.6 SFM
Feed : .002 IPR (continuous)
Feed Rate : 25.1 IPM
Coolant : W.S.O.
Emission pressure : 2MPa
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0100L006B(ø.0394 inch)
Hole depth : 0.079 inch
Cutting speed : 164 SFM
Feed : .002 IPR

Solid Carbide Drill for Die & Mold Machining

High efficiency drilling (continuous feed) (40HRC)

● Unique geometry specially designed for die & mold machining offers high efficiency deep drilling!

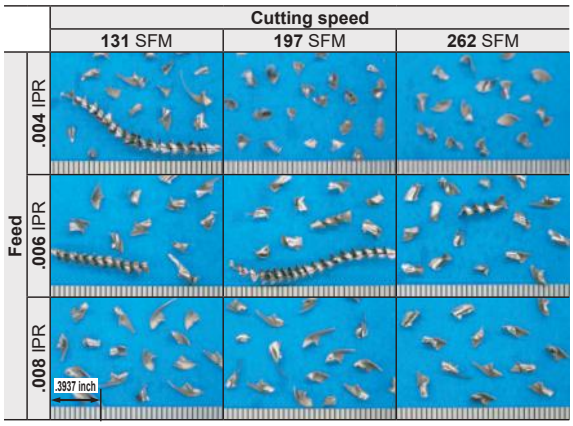


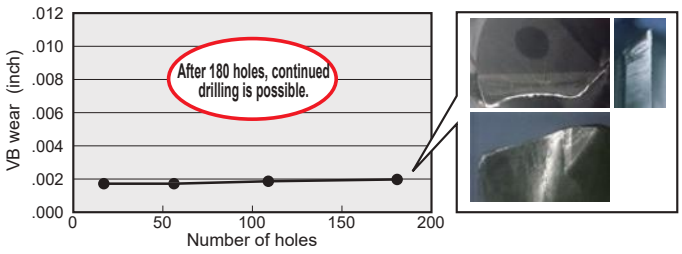
<Cutting conditions>
Workpiece : CENA1 (Plastic mould steel)
Hardness : 40HRC
Drill : MHS0600L150B (ø.2362 inch)
Hole depth : 4.528 inch
Cutting speed : 197 SFM
Feed : .006 IPR (continuous)
Feed Rate : 18.8 IPM
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0600L030B (ø.2362 inch)
Hole depth : .2362 inch
Cutting speed : 197 SFM
Feed : .006 IPR

Cutting performance for different workpieces

STAVAX (33HRC)



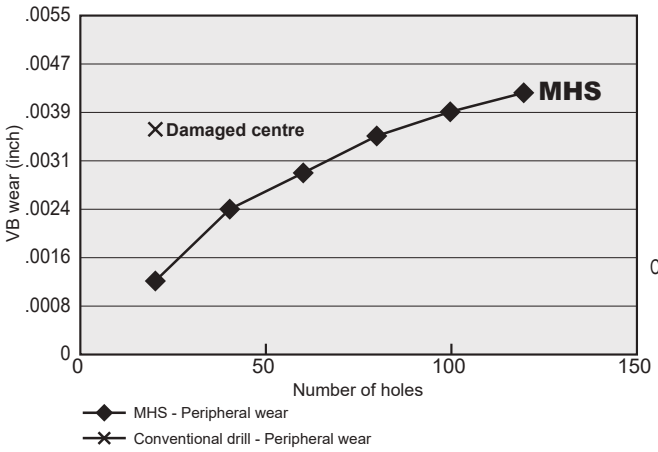


<Cutting conditions>
Workpiece : STAVAX (Chromium-alloy stainless steel)
Hardness : 33HRC
Drill : MHS0600L150B (ø.2362 inch)
Hole depth : 4.528 inch (Through hole)
Coolant : W.S.O.
Emission pressure : 2MPa(Internal coolant)

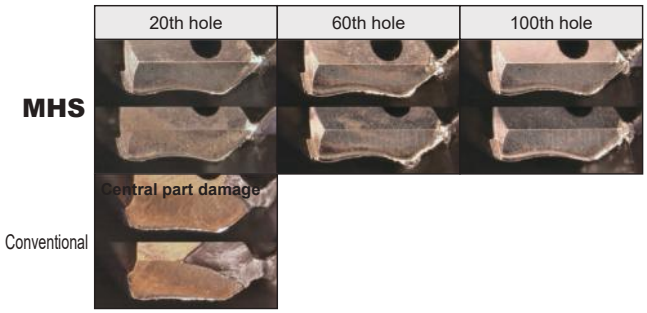
<Cutting conditions>
Cutting speed : 131 SFM
Feed : .006 IPR (continuous)
Feed Rate : 12.52 IPM

<Cutting conditions for pilot drilling>
Drill : MHS0600L030B (ø.2362 inch)
Hole depth : .2362 inch
Cutting speed : 131 SFM
Feed : .006 IPR

STAVAX ESR (52HRC)



■ Cutting edge damage

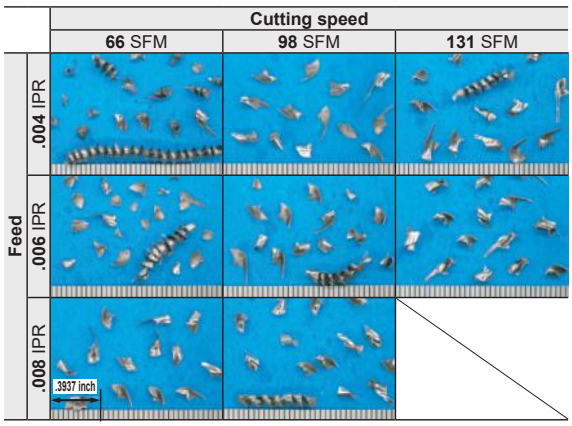


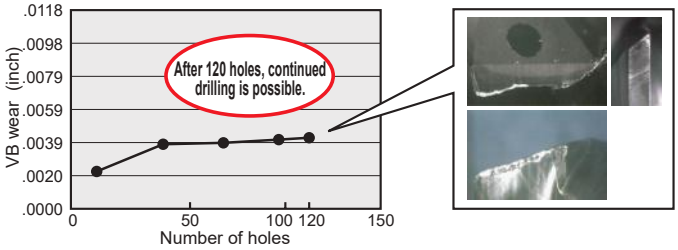
<Cutting conditions>
Workpiece : STAVAX ESR
Hardness : 52HRC
Drill : MHS0200L065B (ø.079 inch)
: 30WHNS0200-TH
Hole depth : 1.969 inch
Coolant : Chlorine-free emulsion
Emission pressure : 1.5MPa
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0200L010B (ø.079 inch)
Hole depth : .157 inch
Cutting speed : 164 SFM
Feed : .002 IPR

<Cutting conditions>
Cutting speed : 164 SFM
Feed : .002 IPR (continuous)

DAC55 (45HRC)





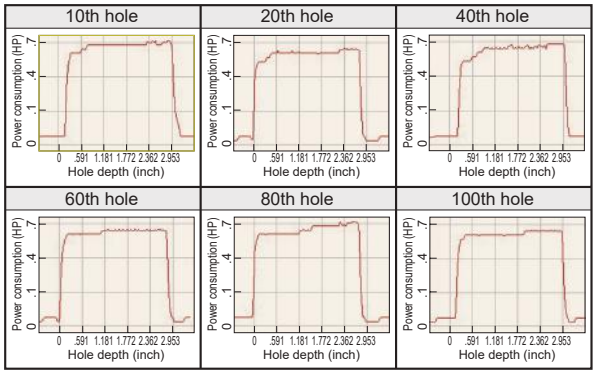
<Cutting conditions>
Workpiece : DAC55 (Die-cast mould steel)
Hardness : 45HRC
Drill : MHS0600L150B (ø.2362 inch)
Hole depth : 4.528 inch
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)

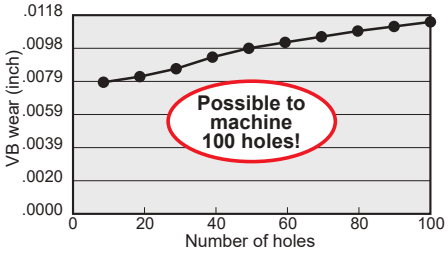
<Cutting conditions>
Cutting speed : 98 SFM
Feed : .004 IPR (continuous)
Feed Rate : 6.3 IPM

<Cutting conditions for pilot drilling>
Drill : MHS0600L030B (ø.2362 inch)
Hole depth : .2362 inch
Cutting speed : 98 SFM
Feed : .004 IPR

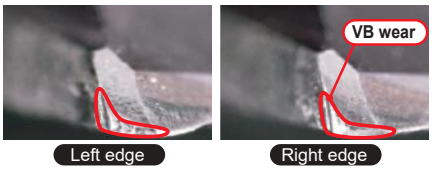
DH31S (50HRC)

Consistent power consumption





VB wear after machining 100 holes

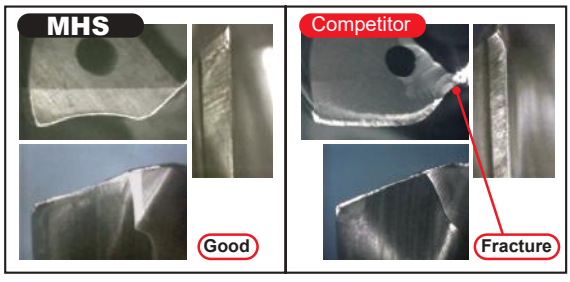


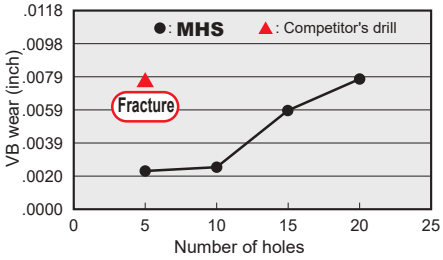
<Cutting conditions>
Workpiece : DH31S (Alloy tool steel)
Hardness : 50HRC
Drill : MHS0500L090B (ø.1969 inch)
Hole depth : 2.756 inch
Cutting speed : 66 SFM
Feed : .006 IPR (continuous)
Feed Rate : 7.52 IPM
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0500L020B (ø.1969 inch)
Hole depth : .197 inch
Cutting Speed feed : 66 SFM
: .006 IPR

SKD11 (55HRC)

Cutting edges after machining 5 holes





<Cutting conditions>
Workpiece : JIS SKD11
Hardness : 55HRC
Drill : MHS0600L120B (ø.2362 inch)
Hole depth : 3.74 inch
Cutting speed : 66 SFM
Feed : .002 IPR (continuous)
Feed Rate : 2.087 IPM
Coolant : W.S.O.
Emission pressure : 2MPa (Internal coolant)
Machine : Machining centre

<Cutting conditions for pilot drilling>
Drill : MHS0600L030B (ø.2362 inch)
Hole depth : .2362 inch
Cutting Speed feed : 66 SFM
: .002 IPR

Solid Carbide Drill for Die & Mold Machining

MHS
WSTAR DRILLS

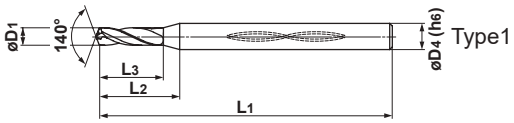
- Unique double margin with high bending resistance
- Non-peck drilling with long tool life for high hardness steel, 35HRC-55HRC

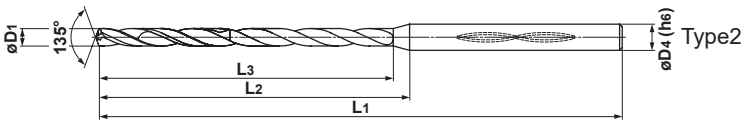
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○	◎	○			○

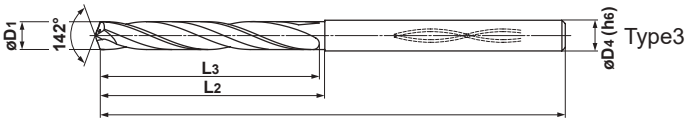
(mm)	D1≤3	3<D1≤6	6<D1≤10	10<D1≤12
	+0.010 −0.002	+0.010 −0.002	+0.010 −0.005	+0.010 −0.008
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011

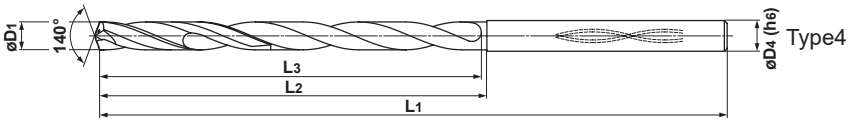
METRIC STANDARD











(Note 1) MHS drills are suitable for use with shrink fit holders.

(Note 2) Use the shortest type in the respective diameter as a pilot drill.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
					3	Int.	★	**MHS0095L006B**	6.0	.236	9.8	.386	60.0	2.362	3.0	.1181	1
					6	Int.	★	**0095L009B**	9.0	.354	12.8	.504	60.0	2.362	3.0	.1181	2
0.95	**.0374**				13	Int.	★	**0095L015B**	15.0	.591	18.8	.740	60.0	2.362	3.0	.1181	2
					23	Int.	★	**0095L025B**	25.0	.984	28.8	1.134	60.0	2.362	3.0	.1181	2
					30	Int.	★	**0095L035B**	35.0	1.378	38.8	1.528	80.0	3.150	3.0	.1181	2
					3	Int.	★	**0100L006B**	6.0	.236	9.7	.382	60.0	2.362	3.0	.1181	1
					6	Int.	★	**0100L009B**	9.0	.354	12.7	.500	60.0	2.362	3.0	.1181	2
1.00	**.0394**				12	Int.	★	**0100L015B**	15.0	.591	18.7	.736	60.0	2.362	3.0	.1181	2
					22	Int.	★	**0100L025B**	25.0	.984	28.7	1.130	60.0	2.362	3.0	.1181	2
					30	Int.	★	**0100L035B**	35.0	1.378	38.7	1.524	80.0	3.150	3.0	.1181	2
					2	Int.	★	**0110L006B**	6.0	.236	9.5	.374	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0110L009B**	9.0	.354	12.5	.492	60.0	2.362	3.0	.1181	2
1.10	**.0433**				11	Int.	★	**0110L015B**	15.0	.591	18.5	.728	60.0	2.362	3.0	.1181	2
					20	Int.	★	**0110L025B**	25.0	.984	28.5	1.122	60.0	2.362	3.0	.1181	2
					29	Int.	★	**0110L035B**	35.0	1.378	38.5	1.516	80.0	3.150	3.0	.1181	2
					2	Int.	★	**0120L006B**	6.0	.236	9.4	.370	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0120L009B**	9.0	.354	12.4	.488	60.0	2.362	3.0	.1181	2
1.20	**.0472**				10	Int.	★	**0120L015B**	15.0	.591	18.4	.724	60.0	2.362	3.0	.1181	2
					18	Int.	★	**0120L025B**	25.0	.984	28.4	1.118	60.0	2.362	3.0	.1181	2
					26	Int.	★	**0120L035B**	35.0	1.378	38.4	1.512	80.0	3.150	3.0	.1181	2
					2	Int.	★	**0130L007B**	7.0	.276	10.2	.402	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0130L011B**	11.0	.433	14.2	.559	60.0	2.362	3.0	.1181	2
1.30	**.0512**				12	Int.	★	**0130L020B**	20.0	.787	23.2	.913	60.0	2.362	3.0	.1181	2
					20	Int.	★	**0130L030B**	30.0	1.181	33.2	1.307	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0130L045B**	45.0	1.772	48.2	1.898	80.0	3.150	3.0	.1181	2

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L_3		L_2		L_1		D_4		
									mm	inch	mm	inch	mm	inch	mm	inch	
1.40	**.0551**		**54**		2	Int.	★	**MHS0140L007B**	7.0	.276	10.0	.394	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0140L011B**	11.0	.433	14.0	.551	60.0	2.362	3.0	.1181	2
					11	Int.	★	**0140L020B**	20.0	.787	23.0	.906	60.0	2.362	3.0	.1181	2
					18	Int.	★	**0140L030B**	30.0	1.181	33.0	1.299	80.0	3.150	3.0	.1181	2
					29	Int.	★	**0140L045B**	45.0	1.772	48.0	1.890	80.0	3.150	3.0	.1181	2
1.45	**.0571**				3	Int.	★	**0145L008B**	8.0	.315	10.9	.429	60.0	2.362	3.0	.1181	1
					6	Int.	★	**0145L013B**	13.0	.512	15.9	.626	60.0	2.362	3.0	.1181	2
					11	Int.	★	**0145L020B**	20.0	.787	22.9	.902	60.0	2.362	3.0	.1181	2
					21	Int.	★	**0145L035B**	35.0	1.378	37.9	1.492	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0145L055B**	55.0	2.165	57.9	2.280	100.0	3.937	3.0	.1181	2
1.50	**.0591**			**#1-64**	2	Int.	★	**0150L008B**	8.0	.315	10.8	.425	60.0	2.362	3.0	.1181	1
					6	Int.	★	**0150L013B**	13.0	.512	15.8	.622	60.0	2.362	3.0	.1181	2
					10	Int.	★	**0150L020B**	20.0	.787	22.8	.898	60.0	2.362	3.0	.1181	2
					20	Int.	★	**0150L035B**	35.0	1.378	37.8	1.488	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0150L055B**	55.0	2.165	57.8	2.276	100.0	3.937	3.0	.1181	2
1.60	**.0630**				2	Int.	★	**0160L008B**	8.0	.315	10.6	.417	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0160L013B**	13.0	.512	15.6	.614	60.0	2.362	3.0	.1181	2
					10	Int.	★	**0160L020B**	20.0	.787	22.6	.890	60.0	2.362	3.0	.1181	2
					19	Int.	★	**0160L035B**	35.0	1.378	37.6	1.480	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0160L055B**	55.0	2.165	57.6	2.268	100.0	3.937	3.0	.1181	2
1.70	**.0669**		**51**		2	Int.	★	**0170L008B**	8.0	0.315	10.4	.409	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0170L013B**	13.0	.512	15.4	.606	60.0	2.362	3.0	.1181	2
					9	Int.	★	**0170L020B**	20.0	.787	22.4	.882	60.0	2.362	3.0	.1181	2
					18	Int.	★	**0170L035B**	35.0	1.378	37.4	1.472	80.0	3.150	3.0	.1181	2
					29	Int.	★	**0170L055B**	55.0	2.165	57.4	2.260	100.0	3.937	3.0	.1181	2
1.80	**.0709**				3	Int.	★	**0180L010B**	10.0	.394	12.2	.480	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0180L015B**	15.0	.591	17.2	.677	60.0	2.362	3.0	.1181	2
					11	Int.	★	**0180L025B**	25.0	.984	27.2	1.071	60.0	2.362	3.0	.1181	2
					22	Int.	★	**0180L045B**	45.0	1.772	47.2	1.858	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0180L065B**	65.0	2.559	67.2	2.646	100.0	3.937	3.0	.1181	2
1.90	**.0748**				2	Int.	★	**0190L010B**	10.0	.394	12.1	.476	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0190L015B**	15.0	.591	17.1	.673	60.0	2.362	3.0	.1181	2
					10	Int.	★	**0190L025B**	25.0	.984	27.1	1.067	60.0	2.362	3.0	.1181	2
					21	Int.	★	**0190L045B**	45.0	1.772	47.1	1.854	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0190L065B**	65.0	2.559	67.1	2.642	100.0	3.937	3.0	.1181	2
1.95	**.0768**				2	Int.	★	**0195L010B**	10.0	.394	12.0	.472	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0195L015B**	15.0	.591	17.0	.669	60.0	2.362	3.0	.1181	2
					10	Int.	★	**0195L025B**	25.0	.984	27.0	1.063	60.0	2.362	3.0	.1181	2
					20	Int.	★	**0195L045B**	45.0	1.772	47.0	1.850	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0195L065B**	65.0	2.559	67.0	2.638	100.0	3.937	3.0	.1181	2
2.00	**.0787**			**#3-48**	2	Int.	★	**0200L010B**	10.0	.394	11.9	.469	60.0	2.362	3.0	.1181	1
					5	Int.	★	**0200L015B**	15.0	.591	16.9	.665	60.0	2.362	3.0	.1181	2
					9	Int.	★	**0200L025B**	25.0	.984	26.9	1.059	60.0	2.362	3.0	.1181	2
					20	Int.	★	**0200L045B**	45.0	1.772	46.9	1.846	80.0	3.150	3.0	.1181	2
					30	Int.	★	**0200L065B**	65.0	2.559	66.9	2.634	100.0	3.937	3.0	.1181	2

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
2.10	.0827				3	Int.	★	MHS0210L012B	12.0	.472	13.7	.539	60.0	2.362	3.0	.1181	1
					7	Int.	★	0210L020B	20.0	.787	21.7	.854	60.0	2.362	3.0	.1181	2
					11	Int.	★	0210L030B	30.0	1.181	31.7	1.248	80.0	3.150	3.0	.1181	2
					23	Int.	★	0210L055B	55.0	2.165	56.7	2.232	100.0	3.937	3.0	.1181	2
					30	Int.	★	0210L075B	75.0	2.953	76.7	3.020	120.0	4.724	3.0	.1181	2
2.20	.0866				2	Int.	★	0220L012B	12.0	.472	13.5	.531	60.0	2.362	3.0	.1181	1
					6	Int.	★	0220L020B	20.0	.787	21.5	.846	60.0	2.362	3.0	.1181	2
					11	Int.	★	0220L030B	30.0	1.181	31.5	1.240	80.0	3.150	3.0	.1181	2
					22	Int.	★	0220L055B	55.0	2.165	56.5	2.224	100.0	3.937	3.0	.1181	2
					30	Int.	★	0220L075B	75.0	2.953	76.5	3.012	120.0	4.724	3.0	.1181	2
2.30	.0906				2	Int.	★	0230L012B	12.0	.472	13.3	.524	60.0	2.362	3.0	.1181	1
					6	Int.	★	0230L020B	20.0	.787	21.3	.839	60.0	2.362	3.0	.1181	2
					10	Int.	★	0230L030B	30.0	1.181	31.3	1.232	80.0	3.150	3.0	.1181	2
					21	Int.	★	0230L055B	55.0	2.165	56.3	2.217	100.0	3.937	3.0	.1181	2
					30	Int.	★	0230L075B	75.0	2.953	76.3	3.004	120.0	4.724	3.0	.1181	2
2.40	.0945				2	Int.	★	0240L012B	12.0	.472	13.1	.516	60.0	2.362	3.0	.1181	1
					5	Int.	★	0240L020B	20.0	.787	21.1	.831	60.0	2.362	3.0	.1181	2
					9	Int.	★	0240L030B	30.0	1.181	31.1	1.224	80.0	3.150	3.0	.1181	2
					20	Int.	★	0240L055B	55.0	2.165	56.1	2.209	100.0	3.937	3.0	.1181	2
					28	Int.	★	0240L075B	75.0	2.953	76.1	2.996	120.0	4.724	3.0	.1181	2
2.45	.0965				2	Int.	★	0245L013B	13.0	.512	14.0	.551	70.0	2.756	4.0	.1575	1
					5	Int.	★	0245L020B	20.0	.787	21.0	.827	70.0	2.756	4.0	.1575	2
					11	Int.	★	0245L035B	35.0	1.378	36.0	1.417	90.0	3.543	4.0	.1575	2
					24	Int.	★	0245L065B	65.0	2.559	66.0	2.598	110.0	4.331	4.0	.1575	2
					30	Int.	★	0245L090B	90.0	3.543	91.0	3.583	140.0	5.512	4.0	.1575	2
2.50	.0984				2	Int.	★	0250L013B	13.0	.512	15.8	.622	70.0	2.756	4.0	.1575	1
					5	Int.	★	0250L020B	20.0	.787	22.8	.898	70.0	2.756	4.0	.1575	2
					11	Int.	★	0250L035B	35.0	1.378	37.8	1.488	90.0	3.543	4.0	.1575	2
					23	Int.	★	0250L065B	65.0	2.559	67.8	2.669	110.0	4.331	4.0	.1575	2
					30	Int.	★	0250L090B	90.0	3.543	92.8	3.654	140.0	5.512	4.0	.1575	2
2.60	.1024				2	Int.	★	0260L013B	13.0	.512	15.6	.614	70.0	2.756	4.0	.1575	1
					5	Int.	★	0260L020B	20.0	.787	22.6	.890	70.0	2.756	4.0	.1575	2
					10	Int.	★	0260L035B	35.0	1.378	37.6	1.480	90.0	3.543	4.0	.1575	2
					22	Int.	★	0260L065B	65.0	2.559	67.6	2.661	110.0	4.331	4.0	.1575	2
					30	Int.	★	0260L090B	90.0	3.543	92.6	3.646	140.0	5.512	4.0	.1575	2
2.70	.1063		36	#6-32	2	Int.	★	0270L013B	13.0	.512	15.4	.606	70.0	2.756	4.0	.1575	1
					4	Int.	★	0270L020B	20.0	.787	22.4	.882	70.0	2.756	4.0	.1575	2
					10	Int.	★	0270L035B	35.0	1.378	37.4	1.472	90.0	3.543	4.0	.1575	2
					21	Int.	★	0270L065B	65.0	2.559	67.4	2.654	110.0	4.331	4.0	.1575	2
					30	Int.	★	0270L090B	90.0	3.543	92.4	3.638	140.0	5.512	4.0	.1575	2
2.80	.1102		35		2	Int.	★	0280L014B	14.0	.551	16.2	.638	70.0	2.756	4.0	.1575	1
					4	Int.	★	0280L020B	20.0	.787	22.2	.874	70.0	2.756	4.0	.1575	2
					9	Int.	★	0280L035B	35.0	1.378	37.2	1.465	90.0	3.543	4.0	.1575	2
					20	Int.	★	0280L065B	65.0	2.559	67.2	2.646	110.0	4.331	4.0	.1575	2
					29	Int.	★	0280L090B	90.0	3.543	92.2	3.630	140.0	5.512	4.0	.1575	2

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L_3		L_2		L_1		D_4		
									mm	inch	mm	inch	mm	inch	mm	inch	
2.90	**.1142**				2	Int.	★	**MHS0290L014B**	14.0	.551	16.1	.634	70.0	2.756	4.0	.1575	1
					4	Int.	★	**0290L020B**	20.0	.787	22.1	.870	70.0	2.756	4.0	.1575	2
					9	Int.	★	**0290L035B**	35.0	1.378	37.1	1.461	90.0	3.543	4.0	.1575	2
					19	Int.	★	**0290L065B**	65.0	2.559	67.1	2.642	110.0	4.331	4.0	.1575	2
					28	Int.	★	**0290L090B**	90.0	3.543	92.1	3.626	140.0	5.512	4.0	.1575	2
2.95	**.1161**		**32**		2	Int.	★	**0295L014B**	14.0	.551	16.0	.630	70.0	2.756	4.0	.1575	1
					4	Int.	★	**0295L020B**	20.0	.787	22.0	.866	70.0	2.756	4.0	.1575	2
					9	Int.	★	**0295L035B**	35.0	1.378	37.0	1.457	90.0	3.543	4.0	.1575	2
					19	Int.	★	**0295L065B**	65.0	2.559	67.0	2.638	110.0	4.331	4.0	.1575	2
					28	Int.	★	**0295L090B**	90.0	3.543	92.0	3.622	140.0	5.512	4.0	.1575	2
3.0	**.1181**				4	Int.	★	**0300L020B**	19.0	.748	20.0	.787	70.0	2.756	4.0	.1575	3
					10	Int.	★	**0300L040B**	39.0	1.535	40.0	1.575	90.0	3.543	4.0	.1575	4
					17	Int.	★	**0300L060B**	59.0	2.323	60.0	2.362	110.0	4.331	4.0	.1575	4
					27	Int.	★	**0300L090B**	89.0	3.504	90.0	3.543	140.0	5.512	4.0	.1575	4
3.1	**.1220**				4	Int.	□	**0310L020B**	19.5	.768	20.0	.787	70.0	2.756	4.0	.1575	3
					10	Int.	□	**0310L040B**	39.5	1.555	40.0	1.575	90.0	3.543	4.0	.1575	4
					17	Int.	□	**0310L060B**	59.5	2.343	60.0	2.362	110.0	4.331	4.0	.1575	4
					26	Int.	□	**0310L090B**	89.5	3.524	90.0	3.543	140.0	5.512	4.0	.1575	4
3.2	**.1260**				4	Int.	□	**0320L020B**	19.5	.768	20.0	.787	70.0	2.756	4.0	.1575	3
					10	Int.	□	**0320L040B**	39.5	1.555	40.0	1.575	90.0	3.543	4.0	.1575	4
					16	Int.	□	**0320L060B**	59.5	2.343	60.0	2.362	110.0	4.331	4.0	.1575	4
					25	Int.	□	**0320L090B**	89.5	3.524	90.0	3.543	140.0	5.512	4.0	.1575	4
3.3	**.1299**			**M4x0.7**	3	Int.	□	**0330L020B**	19.5	.768	20.0	.787	70.0	2.756	4.0	.1575	3
					9	Int.	□	**0330L040B**	39.5	1.555	40.0	1.575	90.0	3.543	4.0	.1575	4
					16	Int.	□	**0330L060B**	59.5	2.343	60.0	2.362	110.0	4.331	4.0	.1575	4
					25	Int.	□	**0330L090B**	89.5	3.524	90.0	3.543	140.0	5.512	4.0	.1575	4
3.4	**.1339**				3	Int.	□	**0340L020B**	19.5	.768	20.0	.787	70.0	2.756	4.0	.1575	3
					9	Int.	□	**0340L040B**	39.5	1.555	40.0	1.575	90.0	3.543	4.0	.1575	4
					15	Int.	□	**0340L060B**	59.5	2.343	60.0	2.362	110.0	4.331	4.0	.1575	4
					24	Int.	□	**0340L090B**	89.5	3.524	90.0	3.543	140.0	5.512	4.0	.1575	4
3.5	**.1378**				3	Int.	★	**0350L020B**	19.5	.768	20.0	.787	70.0	2.756	4.0	.1575	3
					9	Int.	★	**0350L040B**	39.5	1.555	40.0	1.575	90.0	3.543	4.0	.1575	4
					14	Int.	★	**0350L060B**	59.5	2.343	60.0	2.362	110.0	4.331	4.0	.1575	4
					23	Int.	★	**0350L090B**	89.5	3.524	90.0	3.543	140.0	5.512	4.0	.1575	4
3.6	**.1417**				3	Int.	□	**0360L020B**	20.0	.787	20.0	.787	70.0	2.756	4.0	.1575	3
					9	Int.	□	**0360L040B**	40.0	1.575	40.0	1.575	90.0	3.543	4.0	.1575	4
					14	Int.	□	**0360L060B**	60.0	2.362	60.0	2.362	110.0	4.331	4.0	.1575	4
					22	Int.	□	**0360L090B**	90.0	3.543	90.0	3.543	140.0	5.512	4.0	.1575	4
					30	Int.	□	**0360L120B**	120.0	4.724	120.0	4.724	170.0	6.693	4.0	.1575	4
3.7	**.1457**			**M4.5x0.75**	3	Int.	□	**0370L020B**	20.0	.787	20.0	.787	70.0	2.756	4.0	.1575	3
					8	Int.	□	**0370L040B**	40.0	1.575	40.0	1.575	90.0	3.543	4.0	.1575	4
					14	Int.	□	**0370L060B**	60.0	2.362	60.0	2.362	110.0	4.331	4.0	.1575	4
					22	Int.	□	**0370L090B**	90.0	3.543	90.0	3.543	140.0	5.512	4.0	.1575	4
					30	Int.	□	**0370L120B**	120.0	4.724	120.0	4.724	170.0	6.693	4.0	.1575	4

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.8	.1496		25	#10-24	3	Int.	★	MHS0380L020B	20.0	.787	20.0	.787	70.0	2.756	4.0	.1575	3
					8	Int.	★	0380L040B	40.0	1.575	40.0	1.575	90.0	3.543	4.0	.1575	4
					13	Int.	★	0380L060B	60.0	2.362	60.0	2.362	110.0	4.331	4.0	.1575	4
					21	Int.	★	0380L090B	90.0	3.543	90.0	3.543	140.0	5.512	4.0	.1575	4
					29	Int.	★	0380L120B	120.0	4.724	120.0	4.724	170.0	6.693	4.0	.1575	4
3.9	.1535				3	Int.	□	0390L020B	20.0	.787	20.0	.787	70.0	2.756	4.0	.1575	3
					8	Int.	□	0390L040B	40.0	1.575	40.0	1.575	90.0	3.543	4.0	.1575	4
					13	Int.	□	0390L060B	60.0	2.362	60.0	2.362	110.0	4.331	4.0	.1575	4
					21	Int.	□	0390L090B	90.0	3.543	90.0	3.543	140.0	5.512	4.0	.1575	4
					28	Int.	□	0390L120B	120.0	4.724	120.0	4.724	170.0	6.693	4.0	.1575	4
4.0	.1575				2	Int.	★	0400L020B	20.0	.787	20.0	.787	70.0	2.756	4.0	.1575	3
					7	Int.	★	0400L040B	40.0	1.575	40.0	1.575	90.0	3.543	4.0	.1575	4
					12	Int.	★	0400L060B	60.0	2.362	60.0	2.362	110.0	4.331	4.0	.1575	4
					20	Int.	★	0400L090B	90.0	3.543	90.0	3.543	140.0	5.512	4.0	.1575	4
					27	Int.	★	0400L120B	120.0	4.724	120.0	4.724	170.0	6.693	4.0	.1575	4
4.1	.1614				2	Int.	□	0410L020B	18.5	.728	20.0	.787	70.0	2.756	6.0	.2362	3
					7	Int.	□	0410L040B	38.5	1.516	40.0	1.575	90.0	3.543	6.0	.2362	4
					12	Int.	□	0410L060B	58.5	2.303	60.0	2.362	110.0	4.331	6.0	.2362	4
					19	Int.	□	0410L090B	88.5	3.484	90.0	3.543	140.0	5.512	6.0	.2362	4
					26	Int.	□	0410L120B	118.5	4.665	120.0	4.724	170.0	6.693	6.0	.2362	4
4.2	.1654			M5x0.8	2	Int.	□	0420L020B	18.5	.728	20.0	.787	70.0	2.756	6.0	.2362	3
					7	Int.	□	0420L040B	38.5	1.516	40.0	1.575	90.0	3.543	6.0	.2362	4
					11	Int.	□	0420L060B	58.5	2.303	60.0	2.362	110.0	4.331	6.0	.2362	4
					19	Int.	□	0420L090B	88.5	3.484	90.0	3.543	140.0	5.512	6.0	.2362	4
					26	Int.	□	0420L120B	118.5	4.665	120.0	4.724	170.0	6.693	6.0	.2362	4
4.3	.1693				2	Int.	□	0430L020B	18.5	.728	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	□	0430L040B	38.5	1.516	40.0	1.575	90.0	3.543	6.0	.2362	4
					11	Int.	□	0430L060B	58.5	2.303	60.0	2.362	110.0	4.331	6.0	.2362	4
					18	Int.	□	0430L090B	88.5	3.484	90.0	3.543	140.0	5.512	6.0	.2362	4
					25	Int.	□	0430L120B	118.5	4.665	120.0	4.724	170.0	6.693	6.0	.2362	4
4.4	.1732		17		2	Int.	□	0440L020B	18.5	.728	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	□	0440L040B	38.5	1.516	40.0	1.575	90.0	3.543	6.0	.2362	4
					11	Int.	□	0440L060B	58.5	2.303	60.0	2.362	110.0	4.331	6.0	.2362	4
					18	Int.	□	0440L090B	88.5	3.484	90.0	3.543	140.0	5.512	6.0	.2362	4
					24	Int.	□	0440L120B	118.5	4.665	120.0	4.724	170.0	6.693	6.0	.2362	4
4.5	.1772		16	#12-24	2	Int.	★	0450L020B	18.5	.728	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	★	0450L040B	38.5	1.516	40.0	1.575	90.0	3.543	6.0	.2362	4
					10	Int.	★	0450L060B	58.5	2.303	60.0	2.362	110.0	4.331	6.0	.2362	4
					17	Int.	★	0450L090B	88.5	3.484	90.0	3.543	140.0	5.512	6.0	.2362	4
					24	Int.	★	0450L120B	118.5	4.665	120.0	4.724	170.0	6.693	6.0	.2362	4
4.6	.1811				2	Int.	□	0460L020B	19.0	.748	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	□	0460L040B	39.0	1.535	40.0	1.575	90.0	3.543	6.0	.2362	4
					10	Int.	□	0460L060B	59.0	2.323	60.0	2.362	110.0	4.331	6.0	.2362	4
					17	Int.	□	0460L090B	89.0	3.504	90.0	3.543	140.0	5.512	6.0	.2362	4
					23	Int.	□	0460L120B	119.0	4.685	120.0	4.724	170.0	6.693	6.0	.2362	4
					30	Int.	□	0460L150B	149.0	5.866	150.0	5.906	200.0	7.874	6.0	.2362	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L_3		L_2		L_1		D_4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.7	.1850		13		2	Int.	□	**MHS0470L020B**	19.0	.748	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	□	**0470L040B**	39.0	1.535	40.0	1.575	90.0	3.543	6.0	.2362	4
					10	Int.	□	**0470L060B**	59.0	2.323	60.0	2.362	110.0	4.331	6.0	.2362	4
					16	Int.	□	**0470L090B**	89.0	3.504	90.0	3.543	140.0	5.512	6.0	.2362	4
					23	Int.	□	**0470L120B**	119.0	4.685	120.0	4.724	170.0	6.693	6.0	.2362	4
					29	Int.	□	**0470L150B**	149.0	5.866	150.0	5.906	200.0	7.874	6.0	.2362	4
4.8	.1890		12		1	Int.	★	**0480L020B**	19.0	.748	20.0	.787	70.0	2.756	6.0	.2362	3
					6	Int.	★	**0480L040B**	39.0	1.535	40.0	1.575	90.0	3.543	6.0	.2362	4
					10	Int.	★	**0480L060B**	59.0	2.323	60.0	2.362	110.0	4.331	6.0	.2362	4
					16	Int.	★	**0480L090B**	89.0	3.504	90.0	3.543	140.0	5.512	6.0	.2362	4
					22	Int.	★	**0480L120B**	119.0	4.685	120.0	4.724	170.0	6.693	6.0	.2362	4
					29	Int.	★	**0480L150B**	149.0	5.866	150.0	5.906	200.0	7.874	6.0	.2362	4
4.9	.1929				1	Int.	□	**0490L020B**	19.0	.748	20.0	.787	70.0	2.756	6.0	.2362	3
					5	Int.	□	**0490L040B**	39.0	1.535	40.0	1.575	90.0	3.543	6.0	.2362	4
					10	Int.	□	**0490L060B**	59.0	2.323	60.0	2.362	110.0	4.331	6.0	.2362	4
					16	Int.	□	**0490L090B**	89.0	3.504	90.0	3.543	140.0	5.512	6.0	.2362	4
					22	Int.	□	**0490L120B**	119.0	4.685	120.0	4.724	170.0	6.693	6.0	.2362	4
					28	Int.	□	**0490L150B**	149.0	5.866	150.0	5.906	200.0	7.874	6.0	.2362	4
5.0	.1969			M6x10	1	Int.	★	**0500L020B**	19.0	.748	20.0	.787	70.0	2.756	6.0	.2362	3
					5	Int.	★	**0500L040B**	39.0	1.535	40.0	1.575	90.0	3.543	6.0	.2362	4
					9	Int.	★	**0500L060B**	59.0	2.323	60.0	2.362	110.0	4.331	6.0	.2362	4
					15	Int.	★	**0500L090B**	89.0	3.504	90.0	3.543	140.0	5.512	6.0	.2362	4
					21	Int.	★	**0500L120B**	119.0	4.685	120.0	4.724	170.0	6.693	6.0	.2362	4
					27	Int.	★	**0500L150B**	149.0	5.866	150.0	5.906	200.0	7.874	6.0	.2362	4
5.1	.2008		7	1/4-20	3	Int.	□	**0510L030B**	29.5	1.161	30.0	1.181	80.0	3.150	6.0	.2362	3
					9	Int.	□	**0510L060B**	59.5	2.343	60.0	2.362	110.0	4.331	6.0	.2362	4
					15	Int.	□	**0510L090B**	89.5	3.524	90.0	3.543	140.0	5.512	6.0	.2362	4
					21	Int.	□	**0510L120B**	119.5	4.705	120.0	4.724	170.0	6.693	6.0	.2362	4
					27	Int.	□	**0510L150B**	149.5	5.886	150.0	5.906	200.0	7.874	6.0	.2362	4
5.2	.2047				3	Int.	□	**0520L030B**	29.5	1.161	30.0	1.181	80.0	3.150	6.0	.2362	3
					9	Int.	□	**0520L060B**	59.5	2.343	60.0	2.362	110.0	4.331	6.0	.2362	4
					15	Int.	□	**0520L090B**	89.5	3.524	90.0	3.543	140.0	5.512	6.0	.2362	4
					20	Int.	□	**0520L120B**	119.5	4.705	120.0	4.724	170.0	6.693	6.0	.2362	4
					26	Int.	□	**0520L150B**	149.5	5.886	150.0	5.906	200.0	7.874	6.0	.2362	4
5.3	.2087		4		3	Int.	□	**0530L030B**	29.5	1.161	30.0	1.181	80.0	3.150	6.0	.2362	3
					9	Int.	□	**0530L060B**	59.5	2.343	60.0	2.362	110.0	4.331	6.0	.2362	4
					14	Int.	□	**0530L090B**	89.5	3.524	90.0	3.543	140.0	5.512	6.0	.2362	4
					20	Int.	□	**0530L120B**	119.5	4.705	120.0	4.724	170.0	6.693	6.0	.2362	4
					26	Int.	□	**0530L150B**	149.5	5.886	150.0	5.906	200.0	7.874	6.0	.2362	4
5.4	.2126		3		3	Int.	□	**0540L030B**	29.5	1.161	30.0	1.181	80.0	3.150	6.0	.2362	3
					9	Int.	□	**0540L060B**	59.5	2.343	60.0	2.362	110.0	4.331	6.0	.2362	4
					14	Int.	□	**0540L090B**	89.5	3.524	90.0	3.543	140.0	5.512	6.0	.2362	4
					20	Int.	□	**0540L120B**	119.5	4.705	120.0	4.724	170.0	6.693	6.0	.2362	4
					25	Int.	□	**0540L150B**	149.5	5.886	150.0	5.906	200.0	7.874	6.0	.2362	4

MHS
WSTAR DRILLS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
					3	Int.	★	MHS0550L030B	29.5	1.161	30.0	1.181	80.0	3.150	6.0	.2362	3
					8	Int.	★	0550L060B	59.5	2.343	60.0	2.362	110.0	4.331	6.0	.2362	4
5.5	.2165				14	Int.	★	0550L090B	89.5	3.524	90.0	3.543	140.0	5.512	6.0	.2362	4
					19	Int.	★	0550L120B	119.5	4.705	120.0	4.724	170.0	6.693	6.0	.2362	4
					25	Int.	★	0550L150B	149.5	5.886	150.0	5.906	200.0	7.874	6.0	.2362	4
					3	Int.	□	0560L030B	30.0	1.181	30.0	1.181	80.0	3.150	6.0	.2362	3
					8	Int.	□	0560L060B	60.0	2.362	60.0	2.362	110.0	4.331	6.0	.2362	4
5.6	.2205		2		14	Int.	□	0560L090B	90.0	3.543	90.0	3.543	140.0	5.512	6.0	.2362	4
					19	Int.	□	0560L120B	120.0	4.724	120.0	4.724	170.0	6.693	6.0	.2362	4
					24	Int.	□	0560L150B	150.0	5.906	150.0	5.906	200.0	7.874	6.0	.2362	4
					3	Int.	□	0570L030B	30.0	1.181	30.0	1.181	80.0	3.150	6.0	.2362	3
					8	Int.	□	0570L060B	60.0	2.362	60.0	2.362	110.0	4.331	6.0	.2362	4
5.7	.2244				13	Int.	□	0570L090B	90.0	3.543	90.0	3.543	140.0	5.512	6.0	.2362	4
					19	Int.	□	0570L120B	120.0	4.724	120.0	4.724	170.0	6.693	6.0	.2362	4
					24	Int.	□	0570L150B	150.0	5.906	150.0	5.906	200.0	7.874	6.0	.2362	4
					3	Int.	★	0580L030B	30.0	1.181	30.0	1.181	80.0	3.150	6.0	.2362	3
					8	Int.	★	0580L060B	60.0	2.362	60.0	2.362	110.0	4.331	6.0	.2362	4
5.8	.2283		1		13	Int.	★	0580L090B	90.0	3.543	90.0	3.543	140.0	5.512	6.0	.2362	4
					18	Int.	★	0580L120B	120.0	4.724	120.0	4.724	170.0	6.693	6.0	.2362	4
					23	Int.	★	0580L150B	150.0	5.906	150.0	5.906	200.0	7.874	6.0	.2362	4
					3	Int.	□	0590L030B	30.0	1.181	30.0	1.181	80.0	3.150	6.0	.2362	3
					8	Int.	□	0590L060B	60.0	2.362	60.0	2.362	110.0	4.331	6.0	.2362	4
5.9	.2323				13	Int.	□	0590L090B	90.0	3.543	90.0	3.543	140.0	5.512	6.0	.2362	4
					18	Int.	□	0590L120B	120.0	4.724	120.0	4.724	170.0	6.693	6.0	.2362	4
					23	Int.	□	0590L150B	150.0	5.906	150.0	5.906	200.0	7.874	6.0	.2362	4
					2	Int.	★	0600L030B	30.0	1.181	30.0	1.181	80.0	3.150	6.0	.2362	3
					7	Int.	★	0600L060B	60.0	2.362	60.0	2.362	110.0	4.331	6.0	.2362	4
6.0	.2362			M7x1.0	12	Int.	★	0600L090B	90.0	3.543	90.0	3.543	140.0	5.512	6.0	.2362	4
					17	Int.	★	0600L120B	120.0	4.724	120.0	4.724	170.0	6.693	6.0	.2362	4
					22	Int.	★	0600L150B	150.0	5.906	150.0	5.906	200.0	7.874	6.0	.2362	4
					2	Int.	□	0610L030B	28.5	1.122	30.0	1.181	80.0	3.150	8.0	.3150	3
					7	Int.	□	0610L060B	58.5	2.303	60.0	2.362	110.0	4.331	8.0	.3150	4
6.1	.2402				12	Int.	□	0610L090B	88.5	3.484	90.0	3.543	140.0	5.512	8.0	.3150	4
					17	Int.	□	0610L120B	118.5	4.665	120.0	4.724	170.0	6.693	8.0	.3150	4
					22	Int.	□	0610L150B	148.5	5.846	150.0	5.906	200.0	7.874	8.0	.3150	4
					2	Int.	□	0620L030B	28.5	1.122	30.0	1.181	80.0	3.150	8.0	.3150	3
					7	Int.	□	0620L060B	58.5	2.303	60.0	2.362	110.0	4.331	8.0	.3150	4
6.2	.2441				12	Int.	□	0620L090B	88.5	3.484	90.0	3.543	140.0	5.512	8.0	.3150	4
					17	Int.	□	0620L120B	118.5	4.665	120.0	4.724	170.0	6.693	8.0	.3150	4
					21	Int.	□	0620L150B	148.5	5.846	150.0	5.906	200.0	7.874	8.0	.3150	4
					2	Int.	□	0630L030B	28.5	1.122	30.0	1.181	80.0	3.150	8.0	.3150	3
					7	Int.	□	0630L060B	58.5	2.303	60.0	2.362	110.0	4.331	8.0	.3150	4
6.3	.2480				12	Int.	□	0630L090B	88.5	3.484	90.0	3.543	140.0	5.512	8.0	.3150	4
					16	Int.	□	0630L120B	118.5	4.665	120.0	4.724	170.0	6.693	8.0	.3150	4
					21	Int.	□	0630L150B	148.5	5.846	150.0	5.906	200.0	7.874	8.0	.3150	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L_3		L_2		L_1		D_4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.4	.2520				2	Int.	□	MHS0640L030B	28.5	1.122	30.0	1.181	80.0	3.150	8.0	.3150	3
					7	Int.	□	0640L060B	58.5	2.303	60.0	2.362	110.0	4.331	8.0	.3150	4
					11	Int.	□	0640L090B	88.5	3.484	90.0	3.543	140.0	5.512	8.0	.3150	4
					16	Int.	□	0640L120B	118.5	4.665	120.0	4.724	170.0	6.693	8.0	.3150	4
					21	Int.	□	0640L150B	148.5	5.846	150.0	5.906	200.0	7.874	8.0	.3150	4
6.5	.2559				2	Int.	★	0650L030B	28.5	1.122	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	★	0650L060B	58.5	2.303	60.0	2.362	110.0	4.331	8.0	.3150	4
					11	Int.	★	0650L090B	88.5	3.484	90.0	3.543	140.0	5.512	8.0	.3150	4
					16	Int.	★	0650L120B	118.5	4.665	120.0	4.724	170.0	6.693	8.0	.3150	4
					20	Int.	★	0650L150B	148.5	5.846	150.0	5.906	200.0	7.874	8.0	.3150	4
6.6	.2598				2	Int.	□	0660L030B	29.0	1.142	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0660L060B	59.0	2.323	60.0	2.362	110.0	4.331	8.0	.3150	4
					11	Int.	□	0660L090B	89.0	3.504	90.0	3.543	140.0	5.512	8.0	.3150	4
					16	Int.	□	0660L120B	119.0	4.685	120.0	4.724	170.0	6.693	8.0	.3150	4
					20	Int.	□	0660L150B	149.0	5.866	150.0	5.906	200.0	7.874	8.0	.3150	4
					28	Int.	□	0660L200B	199.0	7.835	200.0	7.874	250.0	9.843	8.0	.3150	4
6.7	.2638			M8x1.25	2	Int.	□	0670L030B	29.0	1.142	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0670L060B	59.0	2.323	60.0	2.362	110.0	4.331	8.0	.3150	4
					11	Int.	□	0670L090B	89.0	3.504	90.0	3.543	140.0	5.512	8.0	.3150	4
					15	Int.	□	0670L120B	119.0	4.685	120.0	4.724	170.0	6.693	8.0	.3150	4
					20	Int.	□	0670L150B	149.0	5.866	150.0	5.906	200.0	7.874	8.0	.3150	4
					27	Int.	□	0670L200B	199.0	7.835	200.0	7.874	250.0	9.843	8.0	.3150	4
6.8	.2677				2	Int.	★	0680L030B	29.0	1.142	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	★	0680L060B	59.0	2.323	60.0	2.362	110.0	4.331	8.0	.3150	4
					11	Int.	★	0680L090B	89.0	3.504	90.0	3.543	140.0	5.512	8.0	.3150	4
					15	Int.	★	0680L120B	119.0	4.685	120.0	4.724	170.0	6.693	8.0	.3150	4
					19	Int.	★	0680L150B	149.0	5.866	150.0	5.906	200.0	7.874	8.0	.3150	4
					27	Int.	★	0680L200B	199.0	7.835	200.0	7.874	250.0	9.843	8.0	.3150	4
6.9	.2717		I	5/16-24	2	Int.	□	0690L030B	29.0	1.142	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0690L060B	59.0	2.323	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	□	0690L090B	89.0	3.504	90.0	3.543	140.0	5.512	8.0	.3150	4
					15	Int.	□	0690L120B	119.0	4.685	120.0	4.724	170.0	6.693	8.0	.3150	4
					19	Int.	□	0690L150B	149.0	5.866	150.0	5.906	200.0	7.874	8.0	.3150	4
					26	Int.	□	0690L200B	199.0	7.835	200.0	7.874	250.0	9.843	8.0	.3150	4
7.0	.2756			M8x1.0	2	Int.	★	0700L030B	29.0	1.142	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	★	0700L060B	59.0	2.323	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	★	0700L090B	89.0	3.504	90.0	3.543	140.0	5.512	8.0	.3150	4
					14	Int.	★	0700L120B	119.0	4.685	120.0	4.724	170.0	6.693	8.0	.3150	4
					19	Int.	★	0700L150B	149.0	5.866	150.0	5.906	200.0	7.874	8.0	.3150	4
					26	Int.	★	0700L200B	199.0	7.835	200.0	7.874	250.0	9.843	8.0	.3150	4
7.1	.2795				2	Int.	□	0710L030B	29.5	1.161	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0710L060B	59.5	2.343	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	□	0710L090B	89.5	3.524	90.0	3.543	140.0	5.512	8.0	.3150	4
					14	Int.	□	0710L120B	119.5	4.705	120.0	4.724	170.0	6.693	8.0	.3150	4
					19	Int.	□	0710L150B	149.5	5.886	150.0	5.906	200.0	7.874	8.0	.3150	4
					26	Int.	□	0710L200B	199.5	7.854	200.0	7.874	250.0	9.843	8.0	.3150	4

MHS
WSTAR DRILLS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.2	.2835				2	Int.	□	MHS0720L030B	29.5	1.161	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0720L060B	59.5	2.343	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	□	0720L090B	89.5	3.524	90.0	3.543	140.0	5.512	8.0	.3150	4
					14	Int.	□	0720L120B	119.5	4.705	120.0	4.724	170.0	6.693	8.0	.3150	4
					18	Int.	□	0720L150B	149.5	5.886	150.0	5.906	200.0	7.874	8.0	.3150	4
					25	Int.	□	0720L200B	199.5	7.854	200.0	7.874	250.0	9.843	8.0	.3150	4
7.3	.2874				2	Int.	□	0730L030B	29.5	1.161	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0730L060B	59.5	2.343	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	□	0730L090B	89.5	3.524	90.0	3.543	140.0	5.512	8.0	.3150	4
					14	Int.	□	0730L120B	119.5	4.705	120.0	4.724	170.0	6.693	8.0	.3150	4
					18	Int.	□	0730L150B	149.5	5.886	150.0	5.906	200.0	7.874	8.0	.3150	4
					25	Int.	□	0730L200B	199.5	7.854	200.0	7.874	250.0	9.843	8.0	.3150	4
7.4	.2913				1	Int.	□	0740L030B	29.5	1.161	30.0	1.181	80.0	3.150	8.0	.3150	3
					6	Int.	□	0740L060B	59.5	2.343	60.0	2.362	110.0	4.331	8.0	.3150	4
					10	Int.	□	0740L090B	89.5	3.524	90.0	3.543	140.0	5.512	8.0	.3150	4
					14	Int.	□	0740L120B	119.5	4.705	120.0	4.724	170.0	6.693	8.0	.3150	4
					18	Int.	□	0740L150B	149.5	5.886	150.0	5.906	200.0	7.874	8.0	.3150	4
					24	Int.	□	0740L200B	199.5	7.854	200.0	7.874	250.0	9.843	8.0	.3150	4
7.5	.2953		M		1	Int.	★	0750L030B	29.5	1.161	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	★	0750L060B	59.5	2.343	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	★	0750L090B	89.5	3.524	90.0	3.543	140.0	5.512	8.0	.3150	4
					13	Int.	★	0750L120B	119.5	4.705	120.0	4.724	170.0	6.693	8.0	.3150	4
					17	Int.	★	0750L150B	149.5	5.886	150.0	5.906	200.0	7.874	8.0	.3150	4
					24	Int.	★	0750L200B	199.5	7.854	200.0	7.874	250.0	9.843	8.0	.3150	4
7.6	.2992				1	Int.	□	0760L030B	30.0	1.181	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	□	0760L060B	60.0	2.362	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	□	0760L090B	90.0	3.543	90.0	3.543	140.0	5.512	8.0	.3150	4
					13	Int.	□	0760L120B	120.0	4.724	120.0	4.724	170.0	6.693	8.0	.3150	4
					17	Int.	□	0760L150B	150.0	5.906	150.0	5.906	200.0	7.874	8.0	.3150	4
					24	Int.	□	0760L200B	200.0	7.874	200.0	7.874	250.0	9.843	8.0	.3150	4
					30	Int.	□	0760L250B	250.0	9.843	250.0	9.843	300.0	11.811	8.0	.3150	4
7.7	.3031				1	Int.	□	0770L030B	30.0	1.181	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	□	0770L060B	60.0	2.362	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	□	0770L090B	90.0	3.543	90.0	3.543	140.0	5.512	8.0	.3150	4
					13	Int.	□	0770L120B	120.0	4.724	120.0	4.724	170.0	6.693	8.0	.3150	4
					17	Int.	□	0770L150B	150.0	5.906	150.0	5.906	200.0	7.874	8.0	.3150	4
					23	Int.	□	0770L200B	200.0	7.874	200.0	7.874	250.0	9.843	8.0	.3150	4
					30	Int.	□	0770L250B	250.0	9.843	250.0	9.843	300.0	11.811	8.0	.3150	4
7.8	.3071				1	Int.	★	0780L030B	30.0	1.181	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	★	0780L060B	60.0	2.362	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	★	0780L090B	90.0	3.543	90.0	3.543	140.0	5.512	8.0	.3150	4
					13	Int.	★	0780L120B	120.0	4.724	120.0	4.724	170.0	6.693	8.0	.3150	4
					17	Int.	★	0780L150B	150.0	5.906	150.0	5.906	200.0	7.874	8.0	.3150	4
					23	Int.	★	0780L200B	200.0	7.874	200.0	7.874	250.0	9.843	8.0	.3150	4
					30	Int.	★	0780L250B	250.0	9.843	250.0	9.843	300.0	11.811	8.0	.3150	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.9	.3110				1	Int.	□	MHS0790L030B	30.0	1.181	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	□	0790L060B	60.0	2.362	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	□	0790L090B	90.0	3.543	90.0	3.543	140.0	5.512	8.0	.3150	4
					13	Int.	□	0790L120B	120.0	4.724	120.0	4.724	170.0	6.693	8.0	.3150	4
					16	Int.	□	0790L150B	150.0	5.906	150.0	5.906	200.0	7.874	8.0	.3150	4
					23	Int.	□	0790L200B	200.0	7.874	200.0	7.874	250.0	9.843	8.0	.3150	4
					29	Int.	□	0790L250B	250.0	9.843	250.0	9.843	300.0	11.811	8.0	.3150	4
8.0	.3150				1	Int.	★	0800L030B	30.0	1.181	30.0	1.181	80.0	3.150	8.0	.3150	3
					5	Int.	★	0800L060B	60.0	2.362	60.0	2.362	110.0	4.331	8.0	.3150	4
					9	Int.	★	0800L090B	90.0	3.543	90.0	3.543	140.0	5.512	8.0	.3150	4
					12	Int.	★	0800L120B	120.0	4.724	120.0	4.724	170.0	6.693	8.0	.3150	4
					16	Int.	★	0800L150B	150.0	5.906	150.0	5.906	200.0	7.874	8.0	.3150	4
					22	Int.	★	0800L200B	200.0	7.874	200.0	7.874	250.0	9.843	8.0	.3150	4
					29	Int.	★	0800L250B	250.0	9.843	250.0	9.843	300.0	11.811	8.0	.3150	4
8.1	.3189				2	Int.	□	0810L040B	38.5	1.516	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0810L090B	88.5	3.484	90.0	3.543	150.0	5.906	10.0	.3937	4
					12	Int.	□	0810L120B	118.5	4.665	120.0	4.724	180.0	7.087	10.0	.3937	4
					16	Int.	□	0810L150B	148.5	5.846	150.0	5.906	210.0	8.268	10.0	.3937	4
					22	Int.	□	0810L200B	198.5	7.815	200.0	7.874	260.0	10.236	10.0	.3937	4
					28	Int.	□	0810L250B	248.5	9.783	250.0	9.843	310.0	12.205	10.0	.3937	4
8.2	.3228		P		2	Int.	□	0820L040B	38.5	1.516	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0820L090B	88.5	3.484	90.0	3.543	150.0	5.906	10.0	.3937	4
					12	Int.	□	0820L120B	118.5	4.665	120.0	4.724	180.0	7.087	10.0	.3937	4
					16	Int.	□	0820L150B	148.5	5.846	150.0	5.906	210.0	8.268	10.0	.3937	4
					22	Int.	□	0820L200B	198.5	7.815	200.0	7.874	260.0	10.236	10.0	.3937	4
					28	Int.	□	0820L250B	248.5	9.783	250.0	9.843	310.0	12.205	10.0	.3937	4
8.3	.3268				2	Int.	□	0830L040B	38.5	1.516	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0830L090B	88.5	3.484	90.0	3.543	150.0	5.906	10.0	.3937	4
					12	Int.	□	0830L120B	118.5	4.665	120.0	4.724	180.0	7.087	10.0	.3937	4
					15	Int.	□	0830L150B	148.5	5.846	150.0	5.906	210.0	8.268	10.0	.3937	4
					21	Int.	□	0830L200B	198.5	7.815	200.0	7.874	260.0	10.236	10.0	.3937	4
					27	Int.	□	0830L250B	248.5	9.783	250.0	9.843	310.0	12.205	10.0	.3937	4
8.4	.3307				2	Int.	□	0840L040B	38.5	1.516	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0840L090B	88.5	3.484	90.0	3.543	150.0	5.906	10.0	.3937	4
					12	Int.	□	0840L120B	118.5	4.665	120.0	4.724	180.0	7.087	10.0	.3937	4
					15	Int.	□	0840L150B	148.5	5.846	150.0	5.906	210.0	8.268	10.0	.3937	4
					21	Int.	□	0840L200B	198.5	7.815	200.0	7.874	260.0	10.236	10.0	.3937	4
					27	Int.	□	0840L250B	248.5	9.783	250.0	9.843	310.0	12.205	10.0	.3937	4
8.5	.3346			M10x1.5	2	Int.	★	0850L040B	38.5	1.516	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	★	0850L090B	88.5	3.484	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	★	0850L120B	118.5	4.665	120.0	4.724	180.0	7.087	10.0	.3937	4
					15	Int.	★	0850L150B	148.5	5.846	150.0	5.906	210.0	8.268	10.0	.3937	4
					21	Int.	★	0850L200B	198.5	7.815	200.0	7.874	260.0	10.236	10.0	.3937	4
					27	Int.	★	0850L250B	248.5	9.783	250.0	9.843	310.0	12.205	10.0	.3937	4

MHS
WSTAR DRILLS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
8.6	.3386		R		2	Int.	□	MHS0860L040B	39.0	1.535	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0860L090B	89.0	3.504	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	□	0860L120B	119.0	4.685	120.0	4.724	180.0	7.087	10.0	.3937	4
					15	Int.	□	0860L150B	149.0	5.866	150.0	5.906	210.0	8.268	10.0	.3937	4
					21	Int.	□	0860L200B	199.0	7.835	200.0	7.874	260.0	10.236	10.0	.3937	4
					26	Int.	□	0860L250B	249.0	9.803	250.0	9.843	310.0	12.205	10.0	.3937	4
8.7	.3425			M10x1.25	2	Int.	□	0870L040B	39.0	1.535	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	□	0870L090B	89.0	3.504	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	□	0870L120B	119.0	4.685	120.0	4.724	180.0	7.087	10.0	.3937	4
					15	Int.	□	0870L150B	149.0	5.866	150.0	5.906	210.0	8.268	10.0	.3937	4
					20	Int.	□	0870L200B	199.0	7.835	200.0	7.874	260.0	10.236	10.0	.3937	4
					26	Int.	□	0870L250B	249.0	9.803	250.0	9.843	310.0	12.205	10.0	.3937	4
8.8	.3465				2	Int.	★	0880L040B	39.0	1.535	40.0	1.575	100.0	3.937	10.0	.3937	3
					8	Int.	★	0880L090B	89.0	3.504	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	★	0880L120B	119.0	4.685	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	★	0880L150B	149.0	5.866	150.0	5.906	210.0	8.268	10.0	.3937	4
					20	Int.	★	0880L200B	199.0	7.835	200.0	7.874	260.0	10.236	10.0	.3937	4
					26	Int.	★	0880L250B	249.0	9.803	250.0	9.843	310.0	12.205	10.0	.3937	4
8.9	.3504				2	Int.	□	0890L040B	39.0	1.535	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0890L090B	89.0	3.504	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	□	0890L120B	119.0	4.685	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	□	0890L150B	149.0	5.866	150.0	5.906	210.0	8.268	10.0	.3937	4
					20	Int.	□	0890L200B	199.0	7.835	200.0	7.874	260.0	10.236	10.0	.3937	4
					25	Int.	□	0890L250B	249.0	9.803	250.0	9.843	310.0	12.205	10.0	.3937	4
9.0	.3543				2	Int.	★	0900L040B	39.0	1.535	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	★	0900L090B	89.0	3.504	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	★	0900L120B	119.0	4.685	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	★	0900L150B	149.0	5.866	150.0	5.906	210.0	8.268	10.0	.3937	4
					20	Int.	★	0900L200B	199.0	7.835	200.0	7.874	260.0	10.236	10.0	.3937	4
					25	Int.	★	0900L250B	249.0	9.803	250.0	9.843	310.0	12.205	10.0	.3937	4
9.1	.3583		T		2	Int.	□	0910L040B	39.5	1.555	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0910L090B	89.5	3.524	90.0	3.543	150.0	5.906	10.0	.3937	4
					11	Int.	□	0910L120B	119.5	4.705	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	□	0910L150B	149.5	5.886	150.0	5.906	210.0	8.268	10.0	.3937	4
					19	Int.	□	0910L200B	199.5	7.854	200.0	7.874	260.0	10.236	10.0	.3937	4
					25	Int.	□	0910L250B	249.5	9.823	250.0	9.843	310.0	12.205	10.0	.3937	4
					30	Int.	□	0910L300B	299.5	11.791	300.0	11.811	360.0	14.173	10.0	.3937	4
9.2	.3622				2	Int.	□	0920L040B	39.5	1.555	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0920L090B	89.5	3.524	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0920L120B	119.5	4.705	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	□	0920L150B	149.5	5.886	150.0	5.906	210.0	8.268	10.0	.3937	4
					19	Int.	□	0920L200B	199.5	7.854	200.0	7.874	260.0	10.236	10.0	.3937	4
					25	Int.	□	0920L250B	249.5	9.823	250.0	9.843	310.0	12.205	10.0	.3937	4
					30	Int.	□	0920L300B	299.5	11.791	300.0	11.811	360.0	14.173	10.0	.3937	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.3	.3661				2	Int.	□	MHS0930L040B	39.5	1.555	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0930L090B	89.5	3.524	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0930L120B	119.5	4.705	120.0	4.724	180.0	7.087	10.0	.3937	4
					14	Int.	□	0930L150B	149.5	5.886	150.0	5.906	210.0	8.268	10.0	.3937	4
					19	Int.	□	0930L200B	199.5	7.854	200.0	7.874	260.0	10.236	10.0	.3937	4
					24	Int.	□	0930L250B	249.5	9.823	250.0	9.843	310.0	12.205	10.0	.3937	4
					30	Int.	□	0930L300B	299.5	11.791	300.0	11.811	360.0	14.173	10.0	.3937	4
9.4	.3701				2	Int.	□	0940L040B	39.5	1.555	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0940L090B	89.5	3.524	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0940L120B	119.5	4.705	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	□	0940L150B	149.5	5.886	150.0	5.906	210.0	8.268	10.0	.3937	4
					19	Int.	□	0940L200B	199.5	7.854	200.0	7.874	260.0	10.236	10.0	.3937	4
					24	Int.	□	0940L250B	249.5	9.823	250.0	9.843	310.0	12.205	10.0	.3937	4
					29	Int.	□	0940L300B	299.5	11.791	300.0	11.811	360.0	14.173	10.0	.3937	4
9.5	.3740				2	Int.	★	0950L040B	39.5	1.555	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	★	0950L090B	89.5	3.524	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	★	0950L120B	119.5	4.705	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	★	0950L150B	149.5	5.886	150.0	5.906	210.0	8.268	10.0	.3937	4
					18	Int.	★	0950L200B	199.5	7.854	200.0	7.874	260.0	10.236	10.0	.3937	4
					24	Int.	★	0950L250B	249.5	9.823	250.0	9.843	310.0	12.205	10.0	.3937	4
					29	Int.	★	0950L300B	299.5	11.791	300.0	11.811	360.0	14.173	10.0	.3937	4
9.6	.3780				2	Int.	□	0960L040B	40.0	1.575	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0960L090B	90.0	3.543	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0960L120B	120.0	4.724	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	□	0960L150B	150.0	5.906	150.0	5.906	210.0	8.268	10.0	.3937	4
					18	Int.	□	0960L200B	200.0	7.874	200.0	7.874	260.0	10.236	10.0	.3937	4
					24	Int.	□	0960L250B	250.0	9.843	250.0	9.843	310.0	12.205	10.0	.3937	4
					29	Int.	□	0960L300B	300.0	11.811	300.0	11.811	360.0	14.173	10.0	.3937	4
9.7	.3819		Tube sheet		2	Int.	□	0970L040B	40.0	1.575	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0970L090B	90.0	3.543	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0970L120B	120.0	4.724	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	□	0970L150B	150.0	5.906	150.0	5.906	210.0	8.268	10.0	.3937	4
					18	Int.	□	0970L200B	200.0	7.874	200.0	7.874	260.0	10.236	10.0	.3937	4
					23	Int.	□	0970L250B	250.0	9.843	250.0	9.843	310.0	12.205	10.0	.3937	4
					28	Int.	□	0970L300B	300.0	11.811	300.0	11.811	360.0	14.173	10.0	.3937	4
9.8	.3858		W		2	Int.	★	0980L040B	40.0	1.575	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	★	0980L090B	90.0	3.543	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	★	0980L120B	120.0	4.724	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	★	0980L150B	150.0	5.906	150.0	5.906	210.0	8.268	10.0	.3937	4
					18	Int.	★	0980L200B	200.0	7.874	200.0	7.874	260.0	10.236	10.0	.3937	4
					23	Int.	★	0980L250B	250.0	9.843	250.0	9.843	310.0	12.205	10.0	.3937	4
					28	Int.	★	0980L300B	300.0	11.811	300.0	11.811	360.0	14.173	10.0	.3937	4

MHS
WSTAR DRILLS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.9	.3898				2	Int.	□	MHS0990L040B	40.0	1.575	40.0	1.575	100.0	3.937	10.0	.3937	3
					7	Int.	□	0990L090B	90.0	3.543	90.0	3.543	150.0	5.906	10.0	.3937	4
					10	Int.	□	0990L120B	120.0	4.724	120.0	4.724	180.0	7.087	10.0	.3937	4
					13	Int.	□	0990L150B	150.0	5.906	150.0	5.906	210.0	8.268	10.0	.3937	4
					18	Int.	□	0990L200B	200.0	7.874	200.0	7.874	260.0	10.236	10.0	.3937	4
					23	Int.	□	0990L250B	250.0	9.843	250.0	9.843	310.0	12.205	10.0	.3937	4
					28	Int.	□	0990L300B	300.0	11.811	300.0	11.811	360.0	14.173	10.0	.3937	4
10.0	.3937				1	Int.	★	1000L040B	40.0	1.575	40.0	1.575	100.0	3.937	10.0	.3937	3
					6	Int.	★	1000L090B	90.0	3.543	90.0	3.543	150.0	5.906	10.0	.3937	4
					9	Int.	★	1000L120B	120.0	4.724	120.0	4.724	180.0	7.087	10.0	.3937	4
					12	Int.	★	1000L150B	150.0	5.906	150.0	5.906	210.0	8.268	10.0	.3937	4
					17	Int.	★	1000L200B	200.0	7.874	200.0	7.874	260.0	10.236	10.0	.3937	4
					22	Int.	★	1000L250B	250.0	9.843	250.0	9.843	310.0	12.205	10.0	.3937	4
					27	Int.	★	1000L300B	300.0	11.811	300.0	11.811	360.0	14.173	10.0	.3937	4
10.1	.3976				1	Int.	□	1010L040B	38.5	1.516	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1010L090B	88.5	3.484	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1010L120B	118.5	4.665	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	□	1010L150B	148.5	5.846	150.0	5.906	210.0	8.268	12.0	.4724	4
					17	Int.	□	1010L200B	198.5	7.815	200.0	7.874	260.0	10.236	12.0	.4724	4
					22	Int.	□	1010L250B	248.5	9.783	250.0	9.843	310.0	12.205	12.0	.4724	4
					27	Int.	□	1010L300B	298.5	11.752	300.0	11.811	360.0	14.173	12.0	.4724	4
10.2	.4016			M12x1.75	1	Int.	□	1020L040B	38.5	1.516	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1020L090B	88.5	3.484	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1020L120B	118.5	4.665	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	□	1020L150B	148.5	5.846	150.0	5.906	210.0	8.268	12.0	.4724	4
					17	Int.	□	1020L200B	198.5	7.815	200.0	7.874	260.0	10.236	12.0	.4724	4
					22	Int.	□	1020L250B	248.5	9.783	250.0	9.843	310.0	12.205	12.0	.4724	4
					27	Int.	□	1020L300B	298.5	11.752	300.0	11.811	360.0	14.173	12.0	.4724	4
10.3	.4055				1	Int.	□	1030L040B	38.5	1.516	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1030L090B	88.5	3.484	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1030L120B	118.5	4.665	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	□	1030L150B	148.5	5.846	150.0	5.906	210.0	8.268	12.0	.4724	4
					17	Int.	□	1030L200B	198.5	7.815	200.0	7.874	260.0	10.236	12.0	.4724	4
					22	Int.	□	1030L250B	248.5	9.783	250.0	9.843	310.0	12.205	12.0	.4724	4
					26	Int.	□	1030L300B	298.5	11.752	300.0	11.811	360.0	14.173	12.0	.4724	4
10.4	.4094				1	Int.	□	1040L040B	38.5	1.516	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1040L090B	88.5	3.484	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1040L120B	118.5	4.665	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	□	1040L150B	148.5	5.846	150.0	5.906	210.0	8.268	12.0	.4724	4
					17	Int.	□	1040L200B	198.5	7.815	200.0	7.874	260.0	10.236	12.0	.4724	4
					21	Int.	□	1040L250B	248.5	9.783	250.0	9.843	310.0	12.205	12.0	.4724	4
					26	Int.	□	1040L300B	298.5	11.752	300.0	11.811	360.0	14.173	12.0	.4724	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3 mm	L3 inch	L2 mm	L2 inch	L1 mm	L1 inch	D4 mm	D4 inch	
10.5	.4134		Z		1	Int.	★	MHS1050L040B	38.5	1.516	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	★	1050L090B	88.5	3.484	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	★	1050L120B	118.5	4.665	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	★	1050L150B	148.5	5.846	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	★	1050L200B	198.5	7.815	200.0	7.874	260.0	10.236	12.0	.4724	4
					21	Int.	★	1050L250B	248.5	9.783	250.0	9.843	310.0	12.205	12.0	.4724	4
					26	Int.	★	1050L300B	298.5	11.752	300.0	11.811	360.0	14.173	12.0	.4724	4
10.6	.4173				1	Int.	□	1060L040B	39.0	1.535	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1060L090B	89.0	3.504	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1060L120B	119.0	4.685	120.0	4.724	180.0	7.087	12.0	.4724	4
					12	Int.	□	1060L150B	149.0	5.866	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	□	1060L200B	199.0	7.835	200.0	7.874	260.0	10.236	12.0	.4724	4
					21	Int.	□	1060L250B	249.0	9.803	250.0	9.843	310.0	12.205	12.0	.4724	4
					26	Int.	□	1060L300B	299.0	11.772	300.0	11.811	360.0	14.173	12.0	.4724	4
10.7	.4213				1	Int.	□	1070L040B	39.0	1.535	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1070L090B	89.0	3.504	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	□	1070L120B	119.0	4.685	120.0	4.724	180.0	7.087	12.0	.4724	4
					11	Int.	□	1070L150B	149.0	5.866	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	□	1070L200B	199.0	7.835	200.0	7.874	260.0	10.236	12.0	.4724	4
					21	Int.	□	1070L250B	249.0	9.803	250.0	9.843	310.0	12.205	12.0	.4724	4
					25	Int.	□	1070L300B	299.0	11.772	300.0	11.811	360.0	14.173	12.0	.4724	4
10.8	.4252			M12x1.25	1	Int.	★	1080L040B	39.0	1.535	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	★	1080L090B	89.0	3.504	90.0	3.543	150.0	5.906	12.0	.4724	4
					9	Int.	★	1080L120B	119.0	4.685	120.0	4.724	180.0	7.087	12.0	.4724	4
					11	Int.	★	1080L150B	149.0	5.866	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	★	1080L200B	199.0	7.835	200.0	7.874	260.0	10.236	12.0	.4724	4
					21	Int.	★	1080L250B	249.0	9.803	250.0	9.843	310.0	12.205	12.0	.4724	4
					25	Int.	★	1080L300B	299.0	11.772	300.0	11.811	360.0	14.173	12.0	.4724	4
10.9	.4291				1	Int.	□	1090L040B	39.0	1.535	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	1090L090B	89.0	3.504	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	1090L120B	119.0	4.685	120.0	4.724	180.0	7.087	12.0	.4724	4
					11	Int.	□	1090L150B	149.0	5.866	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	□	1090L200B	199.0	7.835	200.0	7.874	260.0	10.236	12.0	.4724	4
					20	Int.	□	1090L250B	249.0	9.803	250.0	9.843	310.0	12.205	12.0	.4724	4
					25	Int.	□	1090L300B	299.0	11.772	300.0	11.811	360.0	14.173	12.0	.4724	4
11.0	.4331				1	Int.	★	1100L040B	39.0	1.535	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	★	1100L090B	89.0	3.504	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	★	1100L120B	119.0	4.685	120.0	4.724	180.0	7.087	12.0	.4724	4
					11	Int.	★	1100L150B	149.0	5.866	150.0	5.906	210.0	8.268	12.0	.4724	4
					16	Int.	★	1100L200B	199.0	7.835	200.0	7.874	260.0	10.236	12.0	.4724	4
					20	Int.	★	1100L250B	249.0	9.803	250.0	9.843	310.0	12.205	12.0	.4724	4
					25	Int.	★	1100L300B	299.0	11.772	300.0	11.811	360.0	14.173	12.0	.4724	4

MHS
WSTAR DRILLS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
					1	Int.	□	**MHS1110L040B**	39.5	1.555	40.0	1.575	100.0	3.937	12.0	.4724	3
					6	Int.	□	**1110L090B**	89.5	3.524	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1110L120B**	119.5	4.705	120.0	4.724	180.0	7.087	12.0	.4724	4
11.1	**.4370**				11	Int.	□	**1110L150B**	149.5	5.886	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1110L200B**	199.5	7.854	200.0	7.874	260.0	10.236	12.0	.4724	4
					20	Int.	□	**1110L250B**	249.5	9.823	250.0	9.843	310.0	12.205	12.0	.4724	4
					24	Int.	□	**1110L300B**	299.5	11.791	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	□	**1120L040B**	39.5	1.555	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1120L090B**	89.5	3.524	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1120L120B**	119.5	4.705	120.0	4.724	180.0	7.087	12.0	.4724	4
11.2	**.4409**				11	Int.	□	**1120L150B**	149.5	5.886	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1120L200B**	199.5	7.854	200.0	7.874	260.0	10.236	12.0	.4724	4
					20	Int.	□	**1120L250B**	249.5	9.823	250.0	9.843	310.0	12.205	12.0	.4724	4
					24	Int.	□	**1120L300B**	299.5	11.791	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	□	**1130L040B**	39.5	1.555	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1130L090B**	89.5	3.524	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1130L120B**	119.5	4.705	120.0	4.724	180.0	7.087	12.0	.4724	4
11.3	**.4449**				11	Int.	□	**1130L150B**	149.5	5.886	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1130L200B**	199.5	7.854	200.0	7.874	260.0	10.236	12.0	.4724	4
					20	Int.	□	**1130L250B**	249.5	9.823	250.0	9.843	310.0	12.205	12.0	.4724	4
					24	Int.	□	**1130L300B**	299.5	11.791	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	□	**1140L040B**	39.5	1.555	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1140L090B**	89.5	3.524	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1140L120B**	119.5	4.705	120.0	4.724	180.0	7.087	12.0	.4724	4
11.4	**.4488**				11	Int.	□	**1140L150B**	149.5	5.886	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1140L200B**	199.5	7.854	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	□	**1140L250B**	249.5	9.823	250.0	9.843	310.0	12.205	12.0	.4724	4
					24	Int.	□	**1140L300B**	299.5	11.791	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	★	**1150L040B**	39.5	1.555	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	★	**1150L090B**	89.5	3.524	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	★	**1150L120B**	119.5	4.705	120.0	4.724	180.0	7.087	12.0	.4724	4
11.5	**.4528**				10	Int.	★	**1150L150B**	149.5	5.886	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	★	**1150L200B**	199.5	7.854	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	★	**1150L250B**	249.5	9.823	250.0	9.843	310.0	12.205	12.0	.4724	4
					24	Int.	★	**1150L300B**	299.5	11.791	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	□	**1160L040B**	40.0	1.575	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1160L090B**	90.0	3.543	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1160L120B**	120.0	4.724	120.0	4.724	180.0	7.087	12.0	.4724	4
11.6	**.4567**				10	Int.	□	**1160L150B**	150.0	5.906	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1160L200B**	200.0	7.874	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	□	**1160L250B**	250.0	9.843	250.0	9.843	310.0	12.205	12.0	.4724	4
					23	Int.	□	**1160L300B**	300.0	11.811	300.0	11.811	360.0	14.173	12.0	.4724	4

(Note) Please contact us for any geometry that is not in this catalogue (e.g. different diameter and length).

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

Drill Diameter **D1**					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		VP15TF		**L3**		**L2**		**L1**		**D4**		
									mm	inch	mm	inch	mm	inch	mm	inch	
					1	Int.	□	**MHS1170L040B**	40.0	1.575	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1170L090B**	90.0	3.543	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1170L120B**	120.0	4.724	120.0	4.724	180.0	7.087	12.0	.4724	4
11.7	**.4606**				10	Int.	□	**1170L150B**	150.0	5.906	150.0	5.906	210.0	8.268	12.0	.4724	4
					15	Int.	□	**1170L200B**	200.0	7.874	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	□	**1170L250B**	250.0	9.843	250.0	9.843	310.0	12.205	12.0	.4724	4
					23	Int.	□	**1170L300B**	300.0	11.811	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	★	**1180L040B**	40.0	1.575	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	★	**1180L090B**	90.0	3.543	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	★	**1180L120B**	120.0	4.724	120.0	4.724	180.0	7.087	12.0	.4724	4
11.8	**.4646**				10	Int.	★	**1180L150B**	150.0	5.906	150.0	5.906	210.0	8.268	12.0	.4724	4
					14	Int.	★	**1180L200B**	200.0	7.874	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	★	**1180L250B**	250.0	9.843	250.0	9.843	310.0	12.205	12.0	.4724	4
					23	Int.	★	**1180L300B**	300.0	11.811	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	□	**1190L040B**	40.0	1.575	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	□	**1190L090B**	90.0	3.543	90.0	3.543	150.0	5.906	12.0	.4724	4
					8	Int.	□	**1190L120B**	120.0	4.724	120.0	4.724	180.0	7.087	12.0	.4724	4
11.9	**.4685**	**15/32**			10	Int.	□	**1190L150B**	150.0	5.906	150.0	5.906	210.0	8.268	12.0	.4724	4
					14	Int.	□	**1190L200B**	200.0	7.874	200.0	7.874	260.0	10.236	12.0	.4724	4
					19	Int.	□	**1190L250B**	250.0	9.843	250.0	9.843	310.0	12.205	12.0	.4724	4
					23	Int.	□	**1190L300B**	300.0	11.811	300.0	11.811	360.0	14.173	12.0	.4724	4
					1	Int.	★	**1200L040B**	40.0	1.575	40.0	1.575	100.0	3.937	12.0	.4724	3
					5	Int.	★	**1200L090B**	90.0	3.543	90.0	3.543	150.0	5.906	12.0	.4724	4
					7	Int.	★	**1200L120B**	120.0	4.724	120.0	4.724	180.0	7.087	12.0	.4724	4
12.0	**.4724**			M14x2.0	10	Int.	★	**1200L150B**	150.0	5.906	150.0	5.906	210.0	8.268	12.0	.4724	4
					14	Int.	★	**1200L200B**	200.0	7.874	200.0	7.874	260.0	10.236	12.0	.4724	4
					18	Int.	★	**1200L250B**	250.0	9.843	250.0	9.843	310.0	12.205	12.0	.4724	4
					22	Int.	★	**1200L300B**	300.0	11.811	300.0	11.811	360.0	14.173	12.0	.4724	4

RECOMMENDED CUTTING CONDITIONS

Work Material		Mild Steel (≤180HB) Carbon Steel, Alloy Steel (180-280HB) AISI 1010, 1045, 4140 etc.			Austenitic Stainless Steel (≤200HB) Ferritic, Martensitic Stainless Steel (>200HB) AISI 304, 316 AISI 431, 420 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	130	12700	.0012 (.0008—.0016)	65	6400	.0012 (.0008—.0016)
.0472	**1.2**	160	13200	.0014 (.0010—.0020)	95	8000	.0014 (.0010—.0020)
.0630	**1.6**	195	11900	.0020 (.0012—.0026)	130	8000	.0020 (.0012—.0026)
.0787	**2.0**	230	11100	.0024 (.0016—.0031)	160	8000	.0024 (.0016—.0031)
.0984	**2.5**	260	10200	.0030 (.0020—.0039)	195	7600	.0030 (.0020—.0039)
.1260	**3.2**	260	8000	.0039 (.0028—.0051)	195	6000	.0039 (.0028—.0051)
.1575	**4.0**	260	6400	.0039 (.0035—.0043)	190	4800	.0035 (.0031—.0035)
.1969	**5.0**	260	5100	.0051 (.0043—.0055)	195	3800	.0043 (.0039—.0047)
.2480	**6.3**	260	4000	.0063 (.0055—.0071)	195	3000	.0055 (.0051—.0059)
.3150	**8.0**	255	3200	.0079 (.0071—.0091)	190	2400	.0067 (.0063—.0075)
.3937	**10.0**	255	2600	.0098 (.0087—.0110)	195	1900	.0087 (.0079—.0091)
.4724	**12.0**	260	2100	.0118 (.0106—.0134)	185	1600	.0102 (.0094—.0110)

Work Material		Pre-hardened Steel (35-45HRC) Alloy Tool Steel (≤350HB) AISI P21, P20 ASTM H13, AISI L6 etc.			Hardened Steel (40-55HRC) Precipitation Hardening Martensitic Stainless Steel (<450HB) AISI 431, 420 S17400, S17700 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	65	6400	.0010 (.0008—.0012)	65	6400	.0008 (.0006—.0010)
.0472	**1.2**	95	8000	.0012 (.0008—.0014)	95	8000	.0010 (.0008—.0012)
.0630	**1.6**	130	8000	.0016 (.0012—.0018)	130	8000	.0014 (.0010—.0016)
.0787	**2.0**	160	8000	.0018 (.0014—.0024)	160	8000	.0016 (.0012—.0020)
.0984	**2.5**	195	7600	.0024 (.0018—.0030)	195	7600	.0020 (.0016—.0026)
.1260	**3.2**	195	6000	.0031 (.0024—.0035)	195	6000	.0024 (.0020—.0031)
.1575	**4.0**	190	4800	.0031 (.0028—.0039)	190	4800	.0031 (.0024—.0039)
.1969	**5.0**	195	3800	.0043 (.0035—.0051)	195	3800	.0039 (.0031—.0051)
.2480	**6.3**	195	3000	.0051 (.0043—.0063)	195	3000	.0043 (.0035—.0051)
.3150	**8.0**	190	2400	.0067 (.0055—.0079)	190	2400	.0055 (.0047—.0063)
.3937	**10.0**	195	1900	.0083 (.0067—.0098)	195	1900	.0067 (.0055—.0079)
.4724	**12.0**	185	1600	.0098 (.0083—.0118)	185	1600	.0083 (.0067—.0094)

Work Material		Hardened Steel (40-55HRC) Heat Resistant Alloy ASTM H13, AISI L6 Inconel718 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.0394	**1.0**	30	3200	.0006 (.0006—.0008)
.0472	**1.2**	30	2700	.0008 (.0006—.0010)
.0630	**1.6**	30	2000	.0010 (.0008—.0012)
.0787	**2.0**	60	3200	.0014 (.0010—.0016)
.0984	**2.5**	65	2600	.0016 (.0012—.0020)
.1260	**3.2**	60	2000	.0020 (.0016—.0028)
.1575	**4.0**	95	2400	.0028 (.0020—.0031)
.1969	**5.0**	95	1900	.0031 (.0024—.0039)
.2480	**6.3**	95	1500	.0035 (.0031—.0043)
.3150	**8.0**	120	1500	.0047 (.0039—.0051)
.3937	**10.0**	120	1300	.0059 (.0051—.0067)
.4724	**12.0**	120	1100	.0071 (.0059—.0079)

(Note 1) When using the drill with alength over l/d 10, it is necessary to use a pilot hole as a guide. (If no pilot hole is used then drill breakage can occur)

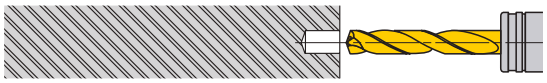
(Note 2) Use the shortest flute drill in the respective size as a pilot drill.

(Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D≥10)

FLAT FACE DRILLING ● Drilling a blind hole

1. Drilling a pilot hole



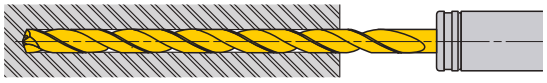
①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial cutting with the long type drill



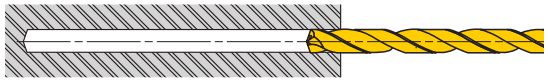
①Penetrate the guide hole at low revolution.
(Revolution 1000 RPM, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction



①After drilling, lower the cutting revolution about .020—.039 inch short of the hole end. (Revolution 1000 RPM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.
③Finally, clear the hole at a cutting speed of 66—98 SFM and feed rate of .008—.012 IPR.

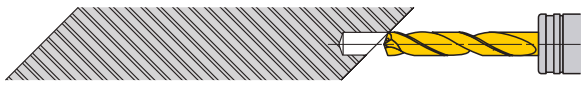
INTERRUPED DRILLING ● Drilling and breaking through on irregular faces or angles

1. Spot facing



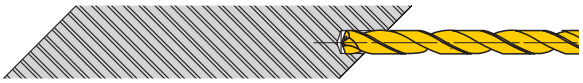
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



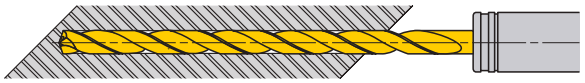
①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1D.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial cutting with the long type drill



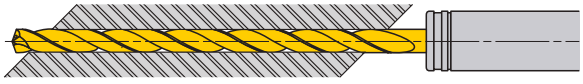
①Penetrate the guide hole at a low revolution.
(Revolution 1000 RPM, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

4. Drill the deep hole



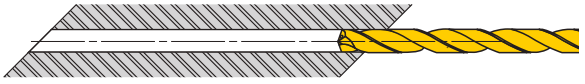
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
②Feed as usual until breaking through.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②Recommend about half rate of the usual feed rate after breaking through.

6. Drill retraction

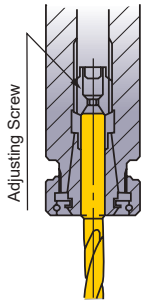


①Finally clear the hole at a revolution speed 1000 RPM and feed rate of .008—.012 IPR.
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.

Solid Carbide Drill for Die & Mold Machining

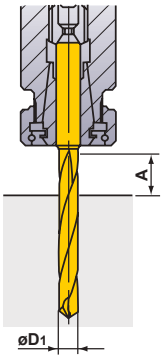
OPERATIONAL GUIDANCE

Drill Holding



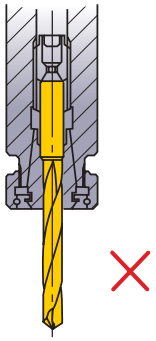
Thrust bearing type collet chuck holds the drill securely.

Drill Length



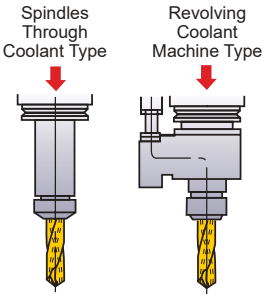
A ≥ D1 x 1.5

Drill Installation



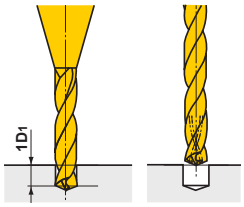
Do not clamp on the flutes.

Through Coolant Type



Less than ø.118 : 1.5MPa-7MP
More than ø.118 : 0.5MPa-7MPa
More than 3MPa is recommended.

Drill Installation



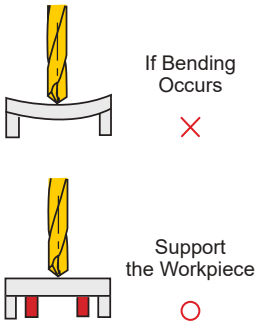
① Drill a prepared hole about 1D1 using the shortest flute length of MHS. (D1=drill diameter)
② Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

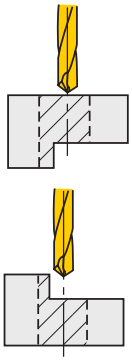
Thin Workpiece



If Bending Occurs ×

Support the Workpiece ○

Interrupted Cutting



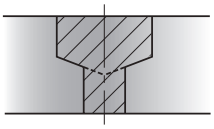
One Process ○

①Lower the feed when drilling the interrupted part.

Requires Prior Machining △

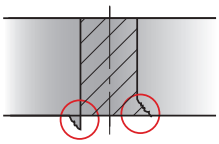
①Spot face with an end mill prior to drilling.

Stepped Holes



①Divide the two processes.
②Drill the larger hole first.
✱ A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate by 50% at the end of through cutting.
②Change the point angle.

Memo

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Dedicated local professionals to answer any of your order, product or technical questions.

TRAINING

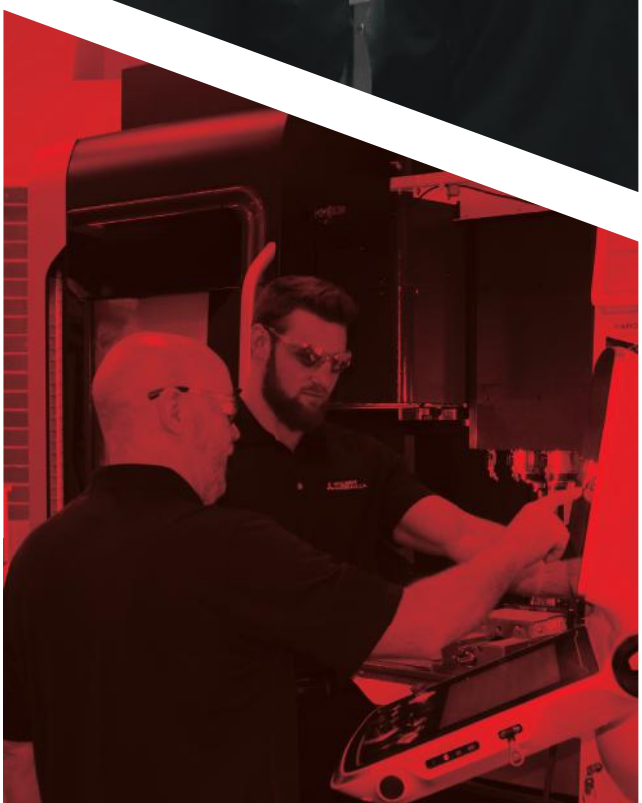
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

PROCESS IMPROVEMENTS

Review of the complete part processing and recommend changes of speed, feed, new tooling, reduction of passes, modifying programming and other solutions to reduce cycle time, save money and be proactive.







WEBINARS

Our FREE online webinar series is available anytime on-demand. Narrated by the MTEC training staff, you will receive in-depth knowledge of the topic. Simply register online at the link below for access. You will receive a certificate upon completion of each course.

mmusnewsstand.com/register

ONLINE TRAINING

Our FREE e-learning program offers 11 courses in drilling, milling, turning, threading, tool grades and workpiece materials. Once each course is completed, you will be given the opportunity to print a certificate.

- Basic Drilling
- Basic Milling
- Basic Turning
- Advanced Drilling
- Advanced End Milling
- Advanced Turning
- Basic Threading
- Advanced Face Milling
- Basic Workpiece Materials
- Tool Grades
- Advanced Workpiece Materials

TRAINING COURSES

Programs are designed for several levels of skill development – from basic understanding to advance manufacturing with digital solutions, complementing to your valued experience in CNC machining environment. Participate in machining demonstrations with Mitsubishi Materials' skilled engineers. Discover methods to reduce setup and cycle time, optimize programs and enhance your knowledge base.

Information on course schedule,
course description, and accommodations

MTECTRAINING.INFO

Follow the QR Code for a virtual facility tour

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MITSUBISHI MATERIALS U.S.A. CORPORATION

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41700 Gardenbrook Road, Suite 120
Novi, MI 48375
Main: 248.308.2620
Fax: 248.308.2627

FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

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