

Solid Carbide Drill for Die & Mould Machining  
**WSTAR** Drill Series

**MHS**

Small  
diameters  
now  
included

Drills for die & mould machining

**Innovative drilling in hardened steel by eliminating the need for heat treatment after machining.  
For high precision, deep holes in hard materials for resin and die cast moulds.**



■ **New smaller diameters  $\phi 0.95 \sim \phi 2.95$   
up to  $30 \times D$  added to the range.  
Complete series up to  $\phi 12$ .**

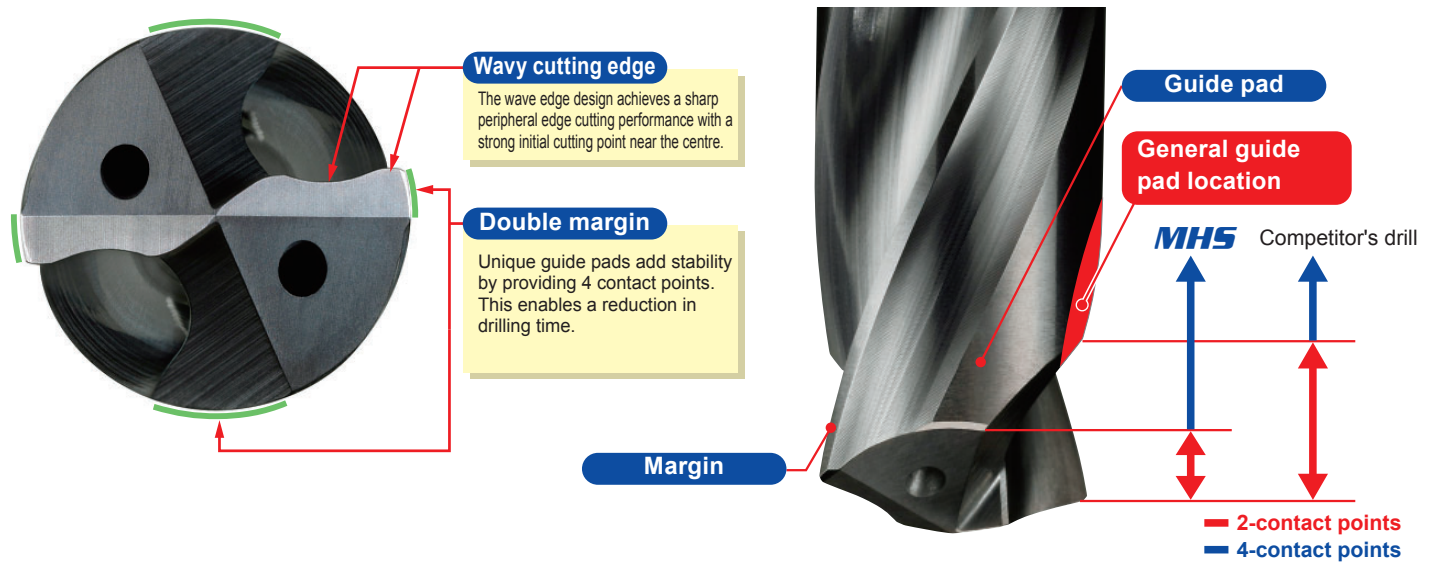
# Solid Carbide Drill for Die & Mould Machining

## WSTAR drill series

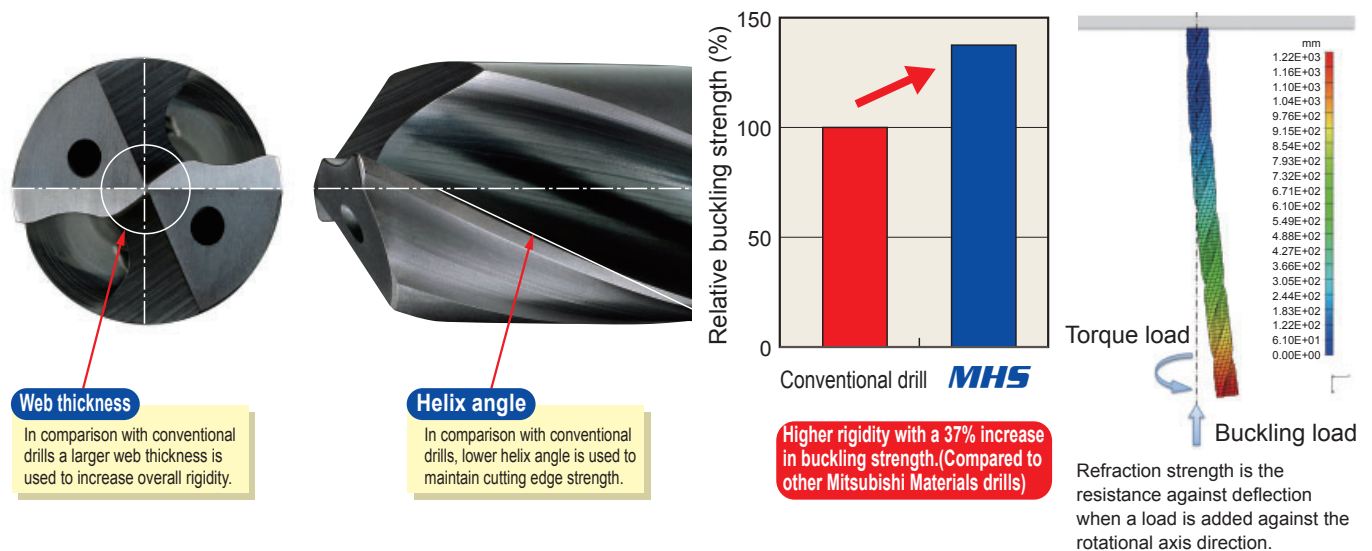
# MHS

### Features

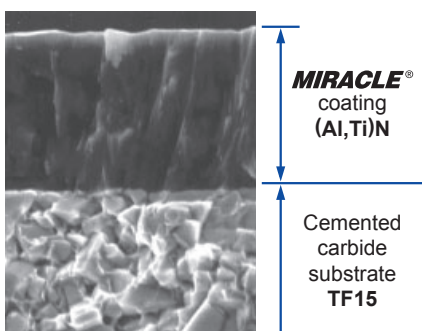
#### Stable machining for the unique cutting edge geometry & double margin flute



#### Strong geometry for stable machining of moulds



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



#### Features of **VP15TF**

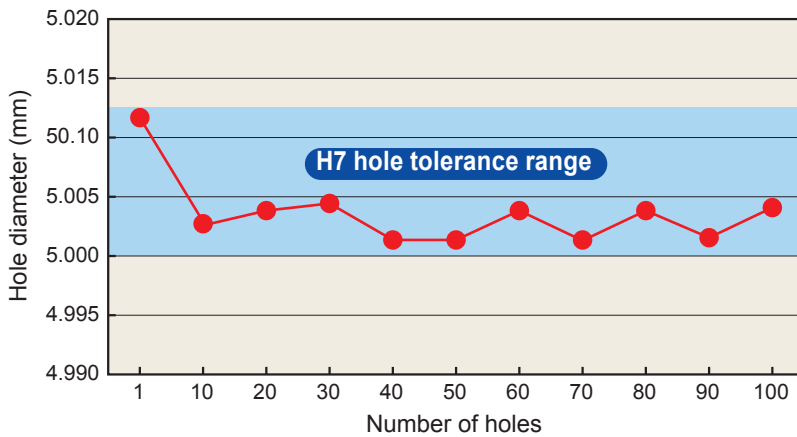
Miracle coated VP15TF is suitable for machining of 35–55HRC mould materials.

**Tough carbide grade**

## Cutting Performance

### High precision (oversize) (48–50HRC)

- Unique geometry specially designed for die & mould machining provides superior hole accuracy!



<Cutting conditions>

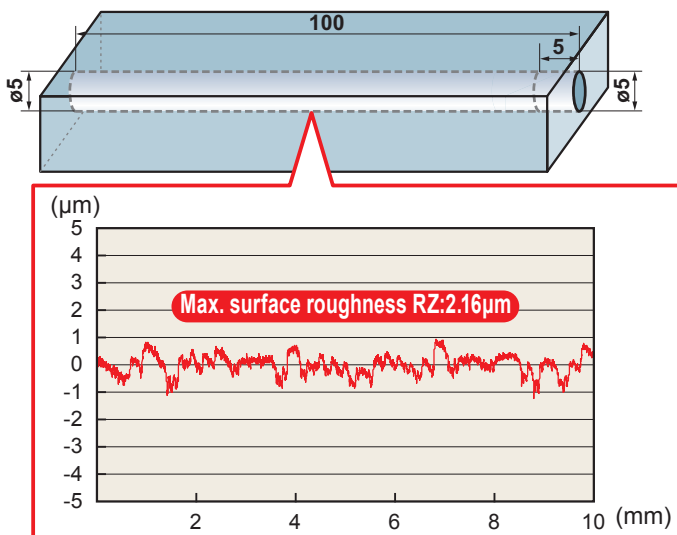
Workpiece : DH31S (Alloy tool steel)  
 Hardness : 48–50HRC  
 Drill : MHS0500L090B (ø5mm)  
 Hole depth : 70mm  
 Cutting speed : 20m/min  
 Feed : 0.15mm/rev (continuous)  
 Feed Rate : 191mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa (Internal coolant)  
 Machine : Machining centre

<Cutting conditions for pilot drilling>

Drill : MHS0500L020B (ø5mm)  
 Hole depth : 5mm  
 Cutting speed : 20m/min  
 Feed : 0.15mm/rev

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

- Unique geometry specially designed for die & mould machining allows for high quality holes!



<Cutting conditions>

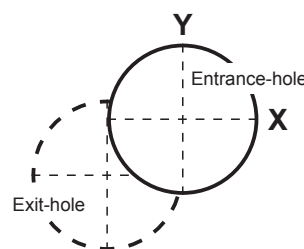
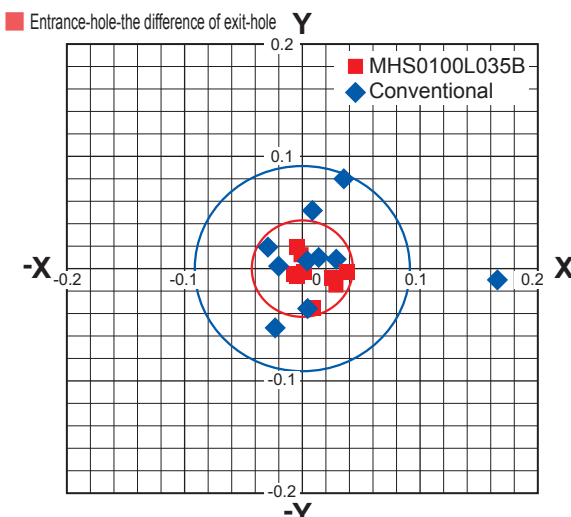
Workpiece : JIS SKD11  
 Hardness : 48–50HRC  
 Drill : MHS0500L120B (ø5mm)  
 Hole depth : 100mm (Through hole)  
 Cutting speed : 20m/min  
 Feed : 0.10mm/rev (continuous)  
 Feed Rate : 127mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa (Internal coolant)  
 Machine : Machining centre

<Cutting conditions for pilot drilling>

Drill : MHS0500L020B (ø5mm)  
 Hole depth : 5mm  
 Cutting speed : 20m/min  
 Feed : 0.10mm/rev

### 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 (ø1mm×Flute length35mm)  
 Hole depth : 25mm (Through hole)  
 Cutting speed : 40m/min  
 Feed : 0.04mm/rev (continuous)  
 Feed Rate : 637mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa  
 Machine : Machining centre

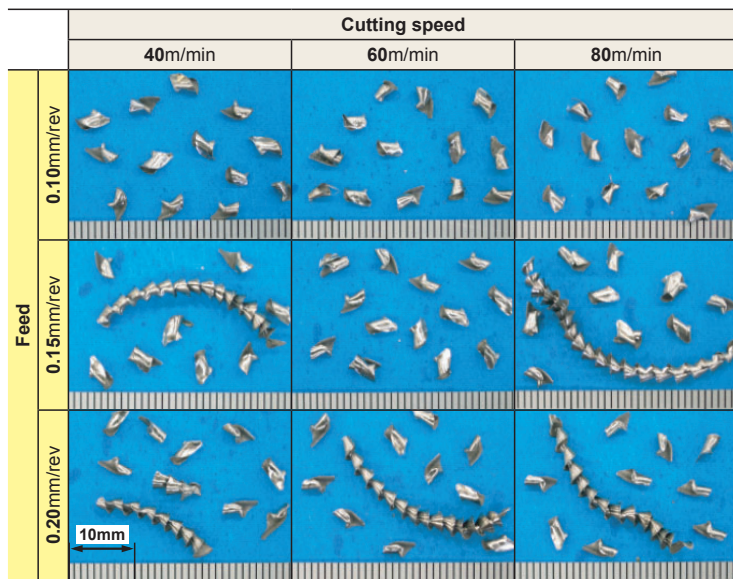
<Cutting conditions for pilot drilling>

Drill : MHS0100L006B(ø1mm)  
 Hole depth : 2mm  
 Cutting speed : 50m/min  
 Feed : 0.04mm/rev



## High efficiency drilling (continuous feed) (40HRC)

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



<Cutting conditions>

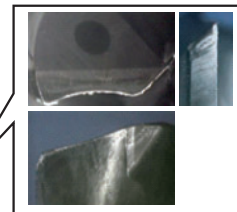
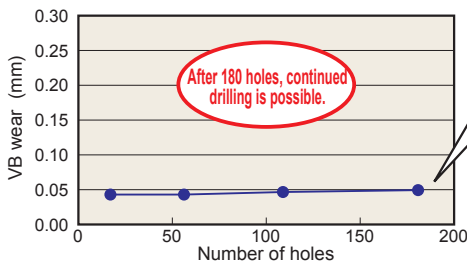
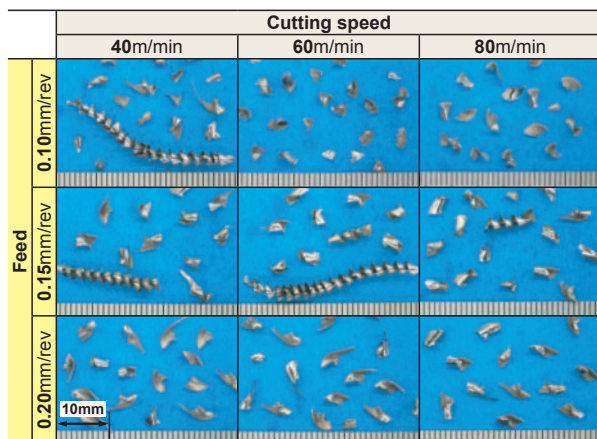
Workpiece : CENA1 (Plastic mould steel)  
 Hardness : 40HRC  
 Drill : MHS0600L150B (ø6mm)  
 Hole depth : 115mm  
 Cutting speed : 60m/min  
 Feed : 0.15mm/rev (continuous)  
 Feed Rate : 477mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa (Internal coolant)  
 Machine : Machining centre

<Cutting conditions for pilot drilling>

Drill : MHS0600L030B (ø6mm)  
 Hole depth : 6mm  
 Cutting speed : 60m/min  
 Feed : 0.15mm/rev

## Cutting performance for different workpieces

### STAVAX (33HRC)



<Cutting conditions>

Workpiece : STAVAX  
 (Chromium-alloy stainless steel)  
 Hardness : 33HRC  
 Drill : MHS0600L150B (ø6mm)  
 Hole depth : 115mm (Through hole)  
 Coolant : W.S.O.  
 Emission pressure : 2MPa  
 (Internal coolant)

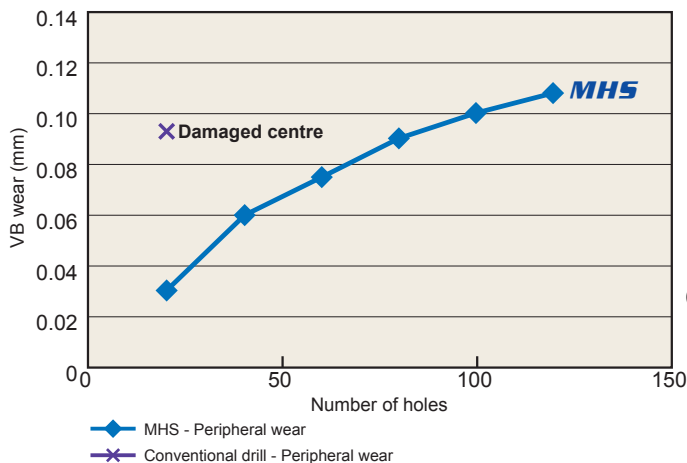
<Cutting conditions>

Cutting speed : 40m/min  
 Feed : 0.15mm/rev  
 (continuous)  
 Feed Rate : 318mm/min

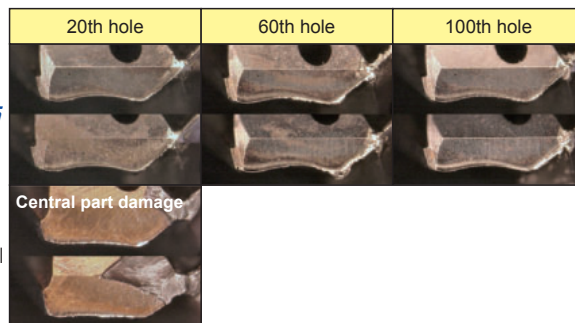
<Cutting conditions for pilot drilling>

Drill : MHS0600L030B  
 (ø6mm): 6mm  
 Hole depth : 40m/min  
 Cutting speed : 0.15mm/rev  
 Feed

### STAVAX ESR (52HRC)



#### Cutting edge damage



<Cutting conditions>

Workpiece : STAVAX ESR  
 Hardness : 52HRC  
 Drill : MHS0200L065B  
 Drill : 30WHNS0200-TH  
 Hole depth : 50mm  
 Coolant : Chlorine-free emulsion  
 Emission pressure : 1.5MPa  
 Machine : Machining centre

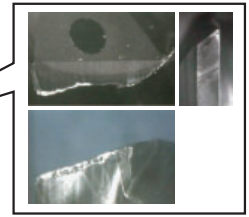
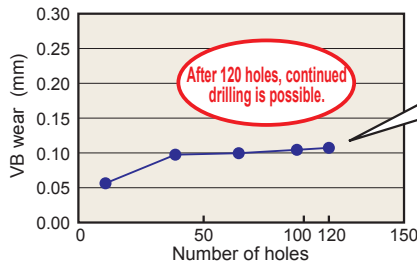
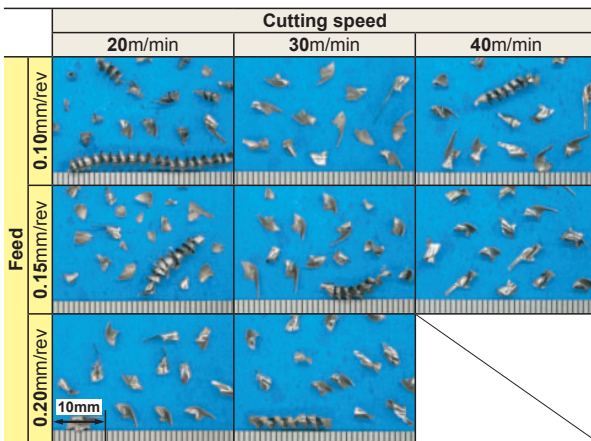
<Cutting conditions for pilot drilling>

Drill : MHS0200L010B  
 Hole depth : 4mm  
 Cutting speed : 50m/min  
 Feed : 0.04mm/rev

<Cutting conditions>

Cutting speed : 50m/min  
 Feed : 0.04mm/rev  
 (continuous)

## DAC55 (45HRC)



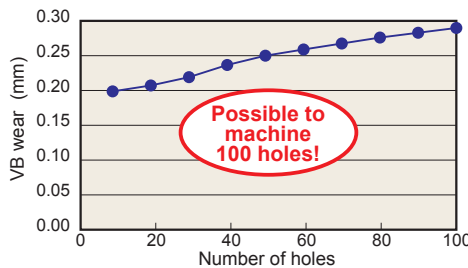
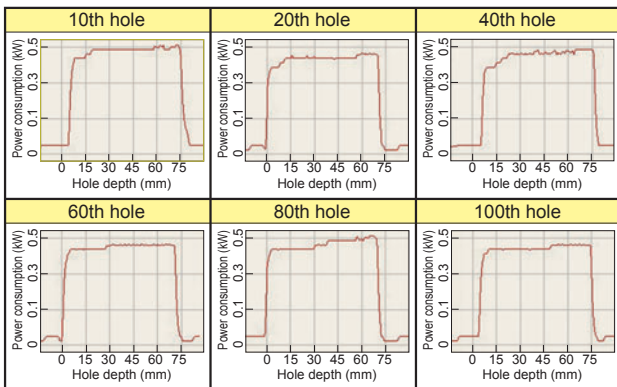
<Cutting conditions>  
 Workpiece : DAC55 (Die-cast mould steel)  
 Hardness : 45HRC  
 Drill : MHS0600L150B (ø6mm)  
 Hole depth : 115mm  
 Coolant : W.S.O.  
 Emission pressure: 2MPa (Internal coolant)

<Cutting conditions>  
 Cutting speed: 30m/min  
 Feed : 0.10mm/rev (continuous)  
 Feed Rate : 159mm/min

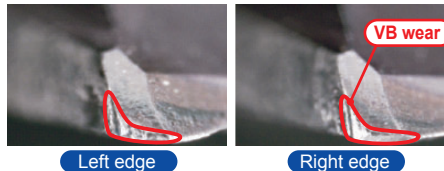
<Cutting conditions for pilot drilling>  
 Drill : MHS0600L030B (ø6mm)  
 Hole depth : 6mm  
 Cutting speed : 30m/min  
 Feed : 0.1mm/rev

## DH31S (50HRC)

### Consistent power consumption



VB wear after machining 100 holes

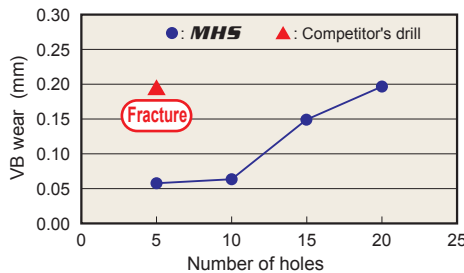
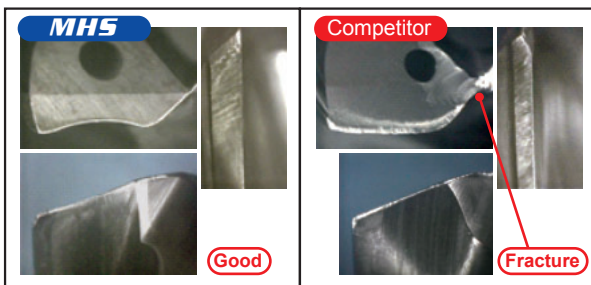


<Cutting conditions>  
 Workpiece : DH31S (Alloy tool steel)  
 Hardness : 50HRC  
 Drill : MHS0500L090B (ø5mm)  
 Hole depth : 70mm  
 Cutting speed : 20m/min  
 Feed : 0.15mm/rev (continuous)  
 Feed Rate : 191mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa (Internal coolant)  
 Machine : Machining centre

<Cutting conditions for pilot drilling>  
 Drill : MHS0500L020B (ø5mm)  
 Hole depth : 5mm  
 Cutting : 20m/min  
 Speed feed : 0.16mm/rev

## SKD11 (55HRC)

### Cutting edges after machining 5 holes



<Cutting conditions>  
 Workpiece : JIS SKD11  
 Hardness : 55HRC  
 Drill : MHS0600L120B (ø6mm)  
 Hole depth : 95mm  
 Cutting speed : 20m/min  
 Feed : 0.05mm/rev (continuous)  
 Feed Rate : 53mm/min  
 Coolant : W.S.O.  
 Emission pressure : 2MPa (Internal coolant)  
 Machine : Machining centre

<Cutting conditions for pilot drilling>  
 Drill : MHS0600L030B (ø6mm)  
 Hole depth : 6mm  
 Cutting : 20m/min  
 Speed feed : 0.05mm/rev

# Solid Carbide Drill for Die & Mould Machining

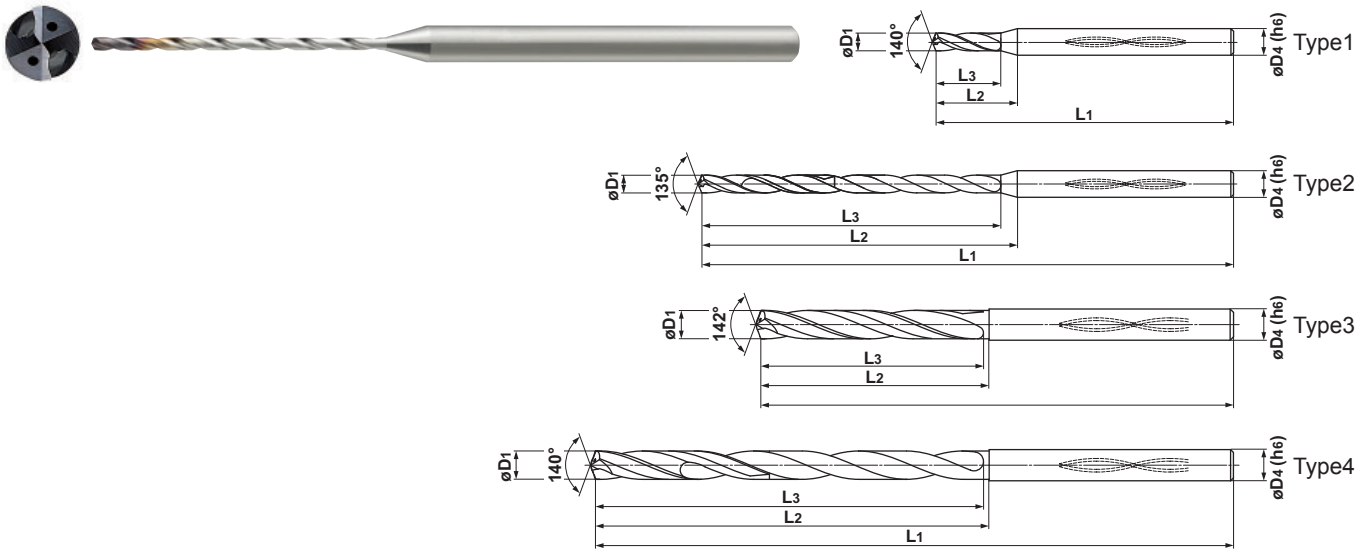
## MHS

### 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
○	◎	○			○

	D1 ≤ 3	3 < D1 ≤ 6	6 < D1 ≤ 10	10 < D1 ≤ 12
h6	+0.010 -0.002	+0.010 -0.002	+0.010 -0.005	+0.010 -0.008
	0 -0.006	0 -0.008	0 -0.009	0 -0.011



(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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP-15TF	Order Number	Dimensions (mm)				
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	Type
NEW 0.95	3	Int.	●	MHS0095L006B	6	9.8	60	3	1
	6	Int.	●	0095L009B	9	12.8	60	3	2
	13	Int.	●	0095L015B	15	18.8	60	3	2
	23	Int.	●	0095L025B	25	28.8	60	3	2
	30	Int.	●	0095L035B	35	38.8	80	3	2
NEW 1.00	3	Int.	●	0100L006B	6	9.7	60	3	1
	6	Int.	●	0100L009B	9	12.7	60	3	2
	12	Int.	●	0100L015B	15	18.7	60	3	2
	22	Int.	●	0100L025B	25	28.7	60	3	2
	30	Int.	●	0100L035B	35	38.7	80	3	2
NEW 1.10	2	Int.	●	0110L006B	6	9.5	60	3	1
	5	Int.	●	0110L009B	9	12.5	60	3	2
	11	Int.	●	0110L015B	15	18.5	60	3	2
	20	Int.	●	0110L025B	25	28.5	60	3	2
	29	Int.	●	0110L035B	35	38.5	80	3	2
NEW 1.20	2	Int.	●	0120L006B	6	9.4	60	3	1
	5	Int.	●	0120L009B	9	12.4	60	3	2
	10	Int.	●	0120L015B	15	18.4	60	3	2
	18	Int.	●	0120L025B	25	28.4	60	3	2
	26	Int.	●	0120L035B	35	38.4	80	3	2
NEW 1.30	2	Int.	●	0130L007B	7	10.2	60	3	1
	5	Int.	●	0130L011B	11	14.2	60	3	2
	12	Int.	●	0130L020B	20	23.2	60	3	2
	20	Int.	●	0130L030B	30	33.2	80	3	2
	30	Int.	●	0130L045B	45	48.2	80	3	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP-15TF	Order Number	Dimensions (mm)				
					Flute Length L3	Neck Length L2	Overall Length L1	Shank Dia. D4	Type
NEW 1.40	2	Int.	●	MHS0140L007B	7	10.0	60	3	1
	5	Int.	●	0140L011B	11	14.0	60	3	2
	11	Int.	●	0140L020B	20	23.0	60	3	2
	18	Int.	●	0140L030B	30	33.0	80	3	2
	29	Int.	●	0140L045B	45	48.0	80	3	2
NEW 1.45	3	Int.	●	0145L008B	8	10.9	60	3	1
	6	Int.	●	0145L013B	13	15.9	60	3	2
	11	Int.	●	0145L020B	20	22.9	60	3	2
	21	Int.	●	0145L035B	35	37.9	80	3	2
	30	Int.	●	0145L055B	55	57.9	100	3	2
NEW 1.50	2	Int.	●	0150L008B	8	10.8	60	3	1
	6	Int.	●	0150L013B	13	15.8	60	3	2
	10	Int.	●	0150L020B	20	22.8	60	3	2
	20	Int.	●	0150L035B	35	37.8	80	3	2
	30	Int.	●	0150L055B	55	57.8	100	3	2
NEW 1.60	2	Int.	●	0160L008B	8	10.6	60	3	1
	5	Int.	●	0160L013B	13	15.6	60	3	2
	10	Int.	●	0160L020B	20	22.6	60	3	2
	19	Int.	●	0160L035B	35	37.6	80	3	2
	30	Int.	●	0160L055B	55	57.6	100	3	2
NEW 1.70	2	Int.	●	0170L008B	8	10.4	60	3	1
	5	Int.	●	0170L013B	13	15.4	60	3	2
	9	Int.	●	0170L020B	20	22.4	60	3	2
	18	Int.	●	0170L035B	35	37.4	80	3	2
	29	Int.	●	0170L055B	55	57.4	100	3	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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
NEW	3	Int.	●	MHS0180L010B	10	12.2	60	3	1
	5	Int.	●	0180L015B	15	17.2	60	3	2
1.80	11	Int.	●	0180L025B	25	27.2	60	3	2
	22	Int.	●	0180L045B	45	47.2	80	3	2
	30	Int.	●	0180L065B	65	67.2	100	3	2
NEW	2	Int.	●	0190L010B	10	12.1	60	3	1
	5	Int.	●	0190L015B	15	17.1	60	3	2
1.90	10	Int.	●	0190L025B	25	27.1	60	3	2
	21	Int.	●	0190L045B	45	47.1	80	3	2
	30	Int.	●	0190L065B	65	67.1	100	3	2
NEW	2	Int.	●	0195L010B	10	12.0	60	3	1
	5	Int.	●	0195L015B	15	17.0	60	3	2
1.95	10	Int.	●	0195L025B	25	27.0	60	3	2
	20	Int.	●	0195L045B	45	47.0	80	3	2
	30	Int.	●	0195L065B	65	67.0	100	3	2
NEW	2	Int.	●	0200L010B	10	11.9	60	3	1
	5	Int.	●	0200L015B	15	16.9	60	3	2
2.00	9	Int.	●	0200L025B	25	26.9	60	3	2
	20	Int.	●	0200L045B	45	46.9	80	3	2
	30	Int.	●	0200L065B	65	66.9	100	3	2
NEW	3	Int.	●	0210L012B	12	13.7	60	3	1
	7	Int.	●	0210L020B	20	21.7	60	3	2
2.10	11	Int.	●	0210L030B	30	31.7	80	3	2
	23	Int.	●	0210L055B	55	56.7	100	3	2
	30	Int.	●	0210L075B	75	76.7	120	3	2
NEW	2	Int.	●	0220L012B	12	13.5	60	3	1
	6	Int.	●	0220L020B	20	21.5	60	3	2
2.20	11	Int.	●	0220L030B	30	31.5	80	3	2
	22	Int.	●	0220L055B	55	56.5	100	3	2
	30	Int.	●	0220L075B	75	76.5	120	3	2
NEW	2	Int.	●	0230L012B	12	13.3	60	3	1
	6	Int.	●	0230L020B	20	21.3	60	3	2
2.30	10	Int.	●	0230L030B	30	31.3	80	3	2
	21	Int.	●	0230L055B	55	56.3	100	3	2
	30	Int.	●	0230L075B	75	76.3	120	3	2
NEW	2	Int.	●	0240L012B	12	13.1	60	3	1
	5	Int.	●	0240L020B	20	21.1	60	3	2
2.40	9	Int.	●	0240L030B	30	31.1	80	3	2
	20	Int.	●	0240L055B	55	56.1	100	3	2
	28	Int.	●	0240L075B	75	76.1	120	3	2
NEW	2	Int.	●	0245L013B	13	14.0	70	4	1
	5	Int.	●	0245L020B	20	21.0	70	4	2
2.45	11	Int.	●	0245L035B	35	36.0	90	4	2
	24	Int.	●	0245L065B	65	66.0	110	4	2
	30	Int.	●	0245L090B	90	91.0	140	4	2
NEW	2	Int.	●	0250L013B	13	15.8	70	4	1
	5	Int.	●	0250L020B	20	22.8	70	4	2
2.50	11	Int.	●	0250L035B	35	37.8	90	4	2
	23	Int.	●	0250L065B	65	67.8	110	4	2
	30	Int.	●	0250L090B	90	92.8	140	4	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
NEW	2	Int.	●	MHS0260L013B	13	15.6	70	4	1
	5	Int.	●	0260L020B	20	22.6	70	4	2
2.60	10	Int.	●	0260L035B	35	37.6	90	4	2
	22	Int.	●	0260L065B	65	67.6	110	4	2
	30	Int.	●	0260L090B	90	92.6	140	4	2
NEW	2	Int.	●	0270L013B	13	15.4	70	4	1
	4	Int.	●	0270L020B	20	22.4	70	4	2
2.70	10	Int.	●	0270L035B	35	37.4	90	4	2
	21	Int.	●	0270L065B	65	67.4	110	4	2
	30	Int.	●	0270L090B	90	92.4	140	4	2
NEW	2	Int.	●	0280L014B	14	16.2	70	4	1
	4	Int.	●	0280L020B	20	22.2	70	4	2
2.80	9	Int.	●	0280L035B	35	37.2	90	4	2
	20	Int.	●	0280L065B	65	67.2	110	4	2
	29	Int.	●	0280L090B	90	92.2	140	4	2
NEW	2	Int.	●	0290L014B	14	16.1	70	4	1
	4	Int.	●	0290L020B	20	22.1	70	4	2
2.90	9	Int.	●	0290L035B	35	37.1	90	4	2
	19	Int.	●	0290L065B	65	67.1	110	4	2
	28	Int.	●	0290L090B	90	92.1	140	4	2
NEW	2	Int.	●	0295L014B	14	16	70	4	1
	4	Int.	●	0295L020B	20	22	70	4	2
2.95	9	Int.	●	0295L035B	35	37	90	4	2
	19	Int.	●	0295L065B	65	67	110	4	2
	28	Int.	●	0295L090B	90	92	140	4	2
	4	Int.	●	0300L020B	19	20	70	4	3
3.0	10	Int.	●	0300L040B	39	40	90	4	4
	17	Int.	●	0300L060B	59	60	110	4	4
	27	Int.	●	0300L090B	89	90	140	4	4
	4	Int.	□	0310L020B	19.5	20	70	4	3
3.1	10	Int.	□	0310L040B	39.5	40	90	4	4
	17	Int.	□	0310L060B	59.5	60	110	4	4
	26	Int.	□	0310L090B	89.5	90	140	4	4
	4	Int.	□	0320L020B	19.5	20	70	4	3
3.2	10	Int.	□	0320L040B	39.5	40	90	4	4
	16	Int.	□	0320L060B	59.5	60	110	4	4
	25	Int.	□	0320L090B	89.5	90	140	4	4
	3	Int.	□	0330L020B	19.5	20	70	4	3
3.3	9	Int.	□	0330L040B	39.5	40	90	4	4
	16	Int.	□	0330L060B	59.5	60	110	4	4
	25	Int.	□	0330L090B	89.5	90	140	4	4
	3	Int.	□	0340L020B	19.5	20	70	4	3
3.4	9	Int.	□	0340L040B	39.5	40	90	4	4
	15	Int.	□	0340L060B	59.5	60	110	4	4
	24	Int.	□	0340L090B	89.5	90	140	4	4
	3	Int.	●	0350L020B	19.5	20	70	4	3
3.5	9	Int.	●	0350L040B	39.5	40	90	4	4
	14	Int.	●	0350L060B	59.5	60	110	4	4
	23	Int.	●	0350L090B	89.5	90	140	4	4





# Solid Carbide Drill for Die & Mould Machining

## MHS WSTAR DRILLS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
3.6	3	Int.	<input type="checkbox"/>	MHS0360L020B	20	20	70	4	3
	9	Int.	<input type="checkbox"/>	0360L040B	40	40	90	4	4
	14	Int.	<input type="checkbox"/>	0360L060B	60	60	110	4	4
	22	Int.	<input type="checkbox"/>	0360L090B	90	90	140	4	4
	30	Int.	<input type="checkbox"/>	0360L120B	120	120	170	4	4
3.7	3	Int.	<input type="checkbox"/>	0370L020B	20	20	70	4	3
	8	Int.	<input type="checkbox"/>	0370L040B	40	40	90	4	4
	14	Int.	<input type="checkbox"/>	0370L060B	60	60	110	4	4
	22	Int.	<input type="checkbox"/>	0370L090B	90	90	140	4	4
3.8	3	Int.	<input checked="" type="checkbox"/>	0380L020B	20	20	70	4	3
	8	Int.	<input checked="" type="checkbox"/>	0380L040B	40	40	90	4	4
	13	Int.	<input checked="" type="checkbox"/>	0380L060B	60	60	110	4	4
	21	Int.	<input checked="" type="checkbox"/>	0380L090B	90	90	140	4	4
3.9	3	Int.	<input type="checkbox"/>	0390L020B	20	20	70	4	3
	8	Int.	<input type="checkbox"/>	0390L040B	40	40	90	4	4
	13	Int.	<input type="checkbox"/>	0390L060B	60	60	110	4	4
	21	Int.	<input type="checkbox"/>	0390L090B	90	90	140	4	4
	28	Int.	<input type="checkbox"/>	0390L120B	120	120	170	4	4
4.0	2	Int.	<input checked="" type="checkbox"/>	0400L020B	20	20	70	4	3
	7	Int.	<input checked="" type="checkbox"/>	0400L040B	40	40	90	4	4
	12	Int.	<input checked="" type="checkbox"/>	0400L060B	60	60	110	4	4
	20	Int.	<input checked="" type="checkbox"/>	0400L090B	90	90	140	4	4
	27	Int.	<input checked="" type="checkbox"/>	0400L120B	120	120	170	4	4
4.1	2	Int.	<input type="checkbox"/>	0410L020B	18.5	20	70	6	3
	7	Int.	<input type="checkbox"/>	0410L040B	38.5	40	90	6	4
	12	Int.	<input type="checkbox"/>	0410L060B	58.5	60	110	6	4
	19	Int.	<input type="checkbox"/>	0410L090B	88.5	90	140	6	4
	26	Int.	<input type="checkbox"/>	0410L120B	118.5	120	170	6	4
4.2	2	Int.	<input type="checkbox"/>	0420L020B	18.5	20	70	6	3
	7	Int.	<input type="checkbox"/>	0420L040B	38.5	40	90	6	4
	11	Int.	<input type="checkbox"/>	0420L060B	58.5	60	110	6	4
	19	Int.	<input type="checkbox"/>	0420L090B	88.5	90	140	6	4
4.3	2	Int.	<input type="checkbox"/>	0430L020B	18.5	20	70	6	3
	6	Int.	<input type="checkbox"/>	0430L040B	38.5	40	90	6	4
	11	Int.	<input type="checkbox"/>	0430L060B	58.5	60	110	6	4
	18	Int.	<input type="checkbox"/>	0430L090B	88.5	90	140	6	4
	25	Int.	<input type="checkbox"/>	0430L120B	118.5	120	170	6	4
4.4	2	Int.	<input type="checkbox"/>	0440L020B	18.5	20	70	6	3
	6	Int.	<input type="checkbox"/>	0440L040B	38.5	40	90	6	4
	11	Int.	<input type="checkbox"/>	0440L060B	58.5	60	110	6	4
	18	Int.	<input type="checkbox"/>	0440L090B	88.5	90	140	6	4
	24	Int.	<input type="checkbox"/>	0440L120B	118.5	120	170	6	4
4.5	2	Int.	<input checked="" type="checkbox"/>	0450L020B	18.5	20	70	6	3
	6	Int.	<input checked="" type="checkbox"/>	0450L040B	38.5	40	90	6	4
	10	Int.	<input checked="" type="checkbox"/>	0450L060B	58.5	60	110	6	4
	17	Int.	<input checked="" type="checkbox"/>	0450L090B	88.5	90	140	6	4
	24	Int.	<input checked="" type="checkbox"/>	0450L120B	118.5	120	170	6	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
4.6	2	Int.	<input type="checkbox"/>	MHS0460L020B	19	20	70	6	3
	6	Int.	<input type="checkbox"/>	0460L040B	39	40	90	6	4
	10	Int.	<input type="checkbox"/>	0460L060B	59	60	110	6	4
	17	Int.	<input type="checkbox"/>	0460L090B	89	90	140	6	4
	23	Int.	<input type="checkbox"/>	0460L120B	119	120	170	6	4
	30	Int.	<input type="checkbox"/>	0460L150B	149	150	200	6	4
4.7	2	Int.	<input type="checkbox"/>	0470L020B	19	20	70	6	3
	6	Int.	<input type="checkbox"/>	0470L040B	39	40	90	6	4
	10	Int.	<input type="checkbox"/>	0470L060B	59	60	110	6	4
	16	Int.	<input type="checkbox"/>	0470L090B	89	90	140	6	4
	23	Int.	<input type="checkbox"/>	0470L120B	119	120	170	6	4
	29	Int.	<input type="checkbox"/>	0470L150B	149	150	200	6	4
4.8	1	Int.	<input checked="" type="checkbox"/>	0480L020B	19	20	70	6	3
	6	Int.	<input checked="" type="checkbox"/>	0480L040B	39	40	90	6	4
	10	Int.	<input checked="" type="checkbox"/>	0480L060B	59	60	110	6	4
	16	Int.	<input checked="" type="checkbox"/>	0480L090B	89	90	140	6	4
	22	Int.	<input checked="" type="checkbox"/>	0480L120B	119	120	170	6	4
4.9	1	Int.	<input type="checkbox"/>	0490L020B	19	20	70	6	3
	5	Int.	<input type="checkbox"/>	0490L040B	39	40	90	6	4
	10	Int.	<input type="checkbox"/>	0490L060B	59	60	110	6	4
	16	Int.	<input type="checkbox"/>	0490L090B	89	90	140	6	4
	22	Int.	<input type="checkbox"/>	0490L120B	119	120	170	6	4
5.0	1	Int.	<input checked="" type="checkbox"/>	0500L020B	19	20	70	6	3
	5	Int.	<input checked="" type="checkbox"/>	0500L040B	39	40	90	6	4
	9	Int.	<input checked="" type="checkbox"/>	0500L060B	59	60	110	6	4
	15	Int.	<input checked="" type="checkbox"/>	0500L090B	89	90	140	6	4
	21	Int.	<input checked="" type="checkbox"/>	0500L120B	119	120	170	6	4
	27	Int.	<input checked="" type="checkbox"/>	0500L150B	149	150	200	6	4
5.1	3	Int.	<input type="checkbox"/>	0510L030B	29.5	30	80	6	3
	9	Int.	<input type="checkbox"/>	0510L060B	59.5	60	110	6	4
	15	Int.	<input type="checkbox"/>	0510L090B	89.5	90	140	6	4
	21	Int.	<input type="checkbox"/>	0510L120B	119.5	120	170	6	4
5.2	3	Int.	<input type="checkbox"/>	0520L030B	29.5	30	80	6	3
	9	Int.	<input type="checkbox"/>	0520L060B	59.5	60	110	6	4
	15	Int.	<input type="checkbox"/>	0520L090B	89.5	90	140	6	4
	20	Int.	<input type="checkbox"/>	0520L120B	119.5	120	170	6	4
	26	Int.	<input type="checkbox"/>	0520L150B	149.5	150	200	6	4
5.3	3	Int.	<input type="checkbox"/>	0530L030B	29.5	30	80	6	3
	9	Int.	<input type="checkbox"/>	0530L060B	59.5	60	110	6	4
	14	Int.	<input type="checkbox"/>	0530L090B	89.5	90	140	6	4
	20	Int.	<input type="checkbox"/>	0530L120B	119.5	120	170	6	4
	26	Int.	<input type="checkbox"/>	0530L150B	149.5	150	200	6	4
5.4	3	Int.	<input type="checkbox"/>	0540L030B	29.5	30	80	6	3
	9	Int.	<input type="checkbox"/>	0540L060B	59.5	60	110	6	4
	14	Int.	<input type="checkbox"/>	0540L090B	89.5	90	140	6	4
	20	Int.	<input type="checkbox"/>	0540L120B	119.5	120	170	6	4
	25	Int.	<input type="checkbox"/>	0540L150B	149.5	150	200	6	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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
5.5	3	Int.	●	MHS0550L030B	29.5	30	80	6	3
	8	Int.	●	0550L060B	59.5	60	110	6	4
	14	Int.	●	0550L090B	89.5	90	140	6	4
	19	Int.	●	0550L120B	119.5	120	170	6	4
	25	Int.	●	0550L150B	149.5	150	200	6	4
5.6	3	Int.	□	0560L030B	30	30	80	6	3
	8	Int.	□	0560L060B	60	60	110	6	4
	14	Int.	□	0560L090B	90	90	140	6	4
	19	Int.	□	0560L120B	120	120	170	6	4
	24	Int.	□	0560L150B	150	150	200	6	4
5.7	3	Int.	□	0570L030B	30	30	80	6	3
	8	Int.	□	0570L060B	60	60	110	6	4
	13	Int.	□	0570L090B	90	90	140	6	4
	19	Int.	□	0570L120B	120	120	170	6	4
	24	Int.	□	0570L150B	150	150	200	6	4
5.8	3	Int.	●	0580L030B	30	30	80	6	3
	8	Int.	●	0580L060B	60	60	110	6	4
	13	Int.	●	0580L090B	90	90	140	6	4
	18	Int.	●	0580L120B	120	120	170	6	4
	23	Int.	●	0580L150B	150	150	200	6	4
5.9	3	Int.	□	0590L030B	30	30	80	6	3
	8	Int.	□	0590L060B	60	60	110	6	4
	13	Int.	□	0590L090B	90	90	140	6	4
	18	Int.	□	0590L120B	120	120	170	6	4
	23	Int.	□	0590L150B	150	150	200	6	4
6.0	2	Int.	●	0600L030B	30	30	80	6	3
	7	Int.	●	0600L060B	60	60	110	6	4
	12	Int.	●	0600L090B	90	90	140	6	4
	17	Int.	●	0600L120B	120	120	170	6	4
	22	Int.	●	0600L150B	150	150	200	6	4
6.1	2	Int.	□	0610L030B	28.5	30	80	8	3
	7	Int.	□	0610L060B	58.5	60	110	8	4
	12	Int.	□	0610L090B	88.5	90	140	8	4
	17	Int.	□	0610L120B	118.5	120	170	8	4
	22	Int.	□	0610L150B	148.5	150	200	8	4
6.2	2	Int.	□	0620L030B	28.5	30	80	8	3
	7	Int.	□	0620L060B	58.5	60	110	8	4
	12	Int.	□	0620L090B	88.5	90	140	8	4
	17	Int.	□	0620L120B	118.5	120	170	8	4
	21	Int.	□	0620L150B	148.5	150	200	8	4
6.3	2	Int.	□	0630L030B	28.5	30	80	8	3
	7	Int.	□	0630L060B	58.5	60	110	8	4
	12	Int.	□	0630L090B	88.5	90	140	8	4
	16	Int.	□	0630L120B	118.5	120	170	8	4
	21	Int.	□	0630L150B	148.5	150	200	8	4
6.4	2	Int.	□	0640L030B	28.5	30	80	8	3
	7	Int.	□	0640L060B	58.5	60	110	8	4
	11	Int.	□	0640L090B	88.5	90	140	8	4
	16	Int.	□	0640L120B	118.5	120	170	8	4
	21	Int.	□	0640L150B	148.5	150	200	8	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
6.5	2	Int.	●	MHS0650L030B	28.5	30	80	8	3
	6	Int.	●	0650L060B	58.5	60	110	8	4
	11	Int.	●	0650L090B	88.5	90	140	8	4
	16	Int.	●	0650L120B	118.5	120	170	8	4
	20	Int.	●	0650L150B	148.5	150	200	8	4
6.6	2	Int.	□	0660L030B	29	30	80	8	3
	6	Int.	□	0660L060B	59	60	110	8	4
	11	Int.	□	0660L090B	89	90	140	8	4
	16	Int.	□	0660L120B	119	120	170	8	4
	20	Int.	□	0660L150B	149	150	200	8	4
6.7	2	Int.	□	0670L030B	29	30	80	8	3
	6	Int.	□	0670L060B	59	60	110	8	4
	11	Int.	□	0670L090B	89	90	140	8	4
	15	Int.	□	0670L120B	119	120	170	8	4
	20	Int.	□	0670L150B	149	150	200	8	4
6.8	2	Int.	●	0680L030B	29	30	80	8	3
	6	Int.	●	0680L060B	59	60	110	8	4
	11	Int.	●	0680L090B	89	90	140	8	4
	15	Int.	●	0680L120B	119	120	170	8	4
	19	Int.	●	0680L150B	149	150	200	8	4
6.9	2	Int.	□	0690L030B	29	30	80	8	3
	6	Int.	□	0690L060B	59	60	110	8	4
	10	Int.	□	0690L090B	89	90	140	8	4
	15	Int.	□	0690L120B	119	120	170	8	4
	19	Int.	□	0690L150B	149	150	200	8	4
7.0	2	Int.	●	0700L030B	29	30	80	8	3
	6	Int.	●	0700L060B	59	60	110	8	4
	10	Int.	●	0700L090B	89	90	140	8	4
	14	Int.	●	0700L120B	119	120	170	8	4
	19	Int.	●	0700L150B	149	150	200	8	4
7.1	2	Int.	□	0710L030B	29.5	30	80	8	3
	6	Int.	□	0710L060B	59.5	60	110	8	4
	10	Int.	□	0710L090B	89.5	90	140	8	4
	14	Int.	□	0710L120B	119.5	120	170	8	4
	19	Int.	□	0710L150B	149.5	150	200	8	4
7.2	2	Int.	□	0720L030B	29.5	30	80	8	3
	6	Int.	□	0720L060B	59.5	60	110	8	4
	10	Int.	□	0720L090B	89.5	90	140	8	4
	14	Int.	□	0720L120B	119.5	120	170	8	4
	18	Int.	□	0720L150B	149.5	150	200	8	4
25	Int.	□	0720L200B	199.5	200	250	8	4	



# Solid Carbide Drill for Die & Mould Machining

## MHS WSTAR DRILLS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
7.3	2	Int.	□	MHS0730L030B	29.5	30	80	8	3
	6	Int.	□	0730L060B	59.5	60	110	8	4
	10	Int.	□	0730L090B	89.5	90	140	8	4
	14	Int.	□	0730L120B	119.5	120	170	8	4
	18	Int.	□	0730L150B	149.5	150	200	8	4
	25	Int.	□	0730L200B	199.5	200	250	8	4
7.4	1	Int.	□	0740L030B	29.5	30	80	8	3
	6	Int.	□	0740L060B	59.5	60	110	8	4
	10	Int.	□	0740L090B	89.5	90	140	8	4
	14	Int.	□	0740L120B	119.5	120	170	8	4
	18	Int.	□	0740L150B	149.5	150	200	8	4
	24	Int.	□	0740L200B	199.5	200	250	8	4
7.5	1	Int.	●	0750L030B	29.5	30	80	8	3
	5	Int.	●	0750L060B	59.5	60	110	8	4
	9	Int.	●	0750L090B	89.5	90	140	8	4
	13	Int.	●	0750L120B	119.5	120	170	8	4
	17	Int.	●	0750L150B	149.5	150	200	8	4
	24	Int.	●	0750L200B	199.5	200	250	8	4
7.6	1	Int.	□	0760L030B	30	30	80	8	3
	5	Int.	□	0760L060B	60	60	110	8	4
	9	Int.	□	0760L090B	90	90	140	8	4
	13	Int.	□	0760L120B	120	120	170	8	4
	17	Int.	□	0760L150B	150	150	200	8	4
	24	Int.	□	0760L200B	200	200	250	8	4
7.7	1	Int.	□	0770L030B	30	30	80	8	3
	5	Int.	□	0770L060B	60	60	110	8	4
	9	Int.	□	0770L090B	90	90	140	8	4
	13	Int.	□	0770L120B	120	120	170	8	4
	17	Int.	□	0770L150B	150	150	200	8	4
	23	Int.	□	0770L200B	200	200	250	8	4
7.8	1	Int.	●	0780L030B	30	30	80	8	3
	5	Int.	●	0780L060B	60	60	110	8	4
	9	Int.	●	0780L090B	90	90	140	8	4
	13	Int.	●	0780L120B	120	120	170	8	4
	17	Int.	●	0780L150B	150	150	200	8	4
	23	Int.	●	0780L200B	200	200	250	8	4
7.9	1	Int.	□	0790L030B	30	30	80	8	3
	5	Int.	□	0790L060B	60	60	110	8	4
	9	Int.	□	0790L090B	90	90	140	8	4
	13	Int.	□	0790L120B	120	120	170	8	4
	16	Int.	□	0790L150B	150	150	200	8	4
	23	Int.	□	0790L200B	200	200	250	8	4
7.9	1	Int.	□	0790L030B	30	30	80	8	3
	5	Int.	□	0790L060B	60	60	110	8	4
	9	Int.	□	0790L090B	90	90	140	8	4
	13	Int.	□	0790L120B	120	120	170	8	4
	16	Int.	□	0790L150B	150	150	200	8	4
	29	Int.	□	0790L250B	250	250	300	8	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.0	1	Int.	●	MHS0800L030B	30	30	80	8	3
	5	Int.	●	0800L060B	60	60	110	8	4
	9	Int.	●	0800L090B	90	90	140	8	4
	12	Int.	●	0800L120B	120	120	170	8	4
	16	Int.	●	0800L150B	150	150	200	8	4
	22	Int.	●	0800L200B	200	200	250	8	4
	29	Int.	●	0800L250B	250	250	300	8	4
	8.1	2	Int.	□	0810L040B	38.5	40	100	10
8		Int.	□	0810L090B	88.5	90	150	10	4
12		Int.	□	0810L120B	118.5	120	180	10	4
16		Int.	□	0810L150B	148.5	150	210	10	4
22		Int.	□	0810L200B	198.5	200	260	10	4
28		Int.	□	0810L250B	248.5	250	310	10	4
8.2	2	Int.	□	0820L040B	38.5	40	100	10	3
	8	Int.	□	0820L090B	88.5	90	150	10	4
	12	Int.	□	0820L120B	118.5	120	180	10	4
	16	Int.	□	0820L150B	148.5	150	210	10	4
	22	Int.	□	0820L200B	198.5	200	260	10	4
	28	Int.	□	0820L250B	248.5	250	310	10	4
8.3	2	Int.	□	0830L040B	38.5	40	100	10	3
	8	Int.	□	0830L090B	88.5	90	150	10	4
	12	Int.	□	0830L120B	118.5	120	180	10	4
	15	Int.	□	0830L150B	148.5	150	210	10	4
	21	Int.	□	0830L200B	198.5	200	260	10	4
	27	Int.	□	0830L250B	248.5	250	310	10	4
8.4	2	Int.	□	0840L040B	38.5	40	100	10	3
	8	Int.	□	0840L090B	88.5	90	150	10	4
	12	Int.	□	0840L120B	118.5	120	180	10	4
	15	Int.	□	0840L150B	148.5	150	210	10	4
	21	Int.	□	0840L200B	198.5	200	260	10	4
	27	Int.	□	0840L250B	248.5	250	310	10	4
8.5	2	Int.	●	0850L040B	38.5	40	100	10	3
	8	Int.	●	0850L090B	88.5	90	150	10	4
	11	Int.	●	0850L120B	118.5	120	180	10	4
	15	Int.	●	0850L150B	148.5	150	210	10	4
	21	Int.	●	0850L200B	198.5	200	260	10	4
	27	Int.	●	0850L250B	248.5	250	310	10	4
8.6	2	Int.	□	0860L040B	39	40	100	10	3
	8	Int.	□	0860L090B	89	90	150	10	4
	11	Int.	□	0860L120B	119	120	180	10	4
	15	Int.	□	0860L150B	149	150	210	10	4
	21	Int.	□	0860L200B	199	200	260	10	4
	26	Int.	□	0860L250B	249	250	310	10	4
8.7	2	Int.	□	0870L040B	39	40	100	10	3
	8	Int.	□	0870L090B	89	90	150	10	4
	11	Int.	□	0870L120B	119	120	180	10	4
	15	Int.	□	0870L150B	149	150	210	10	4
	20	Int.	□	0870L200B	199	200	260	10	4
	26	Int.	□	0870L250B	249	250	310	10	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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
8.8	2	Int.	●	MHS0880L040B	39	40	100	10	3
	8	Int.	●	0880L090B	89	90	150	10	4
	11	Int.	●	0880L120B	119	120	180	10	4
	14	Int.	●	0880L150B	149	150	210	10	4
	20	Int.	●	0880L200B	199	200	260	10	4
	26	Int.	●	0880L250B	249	250	310	10	4
8.9	2	Int.	□	0890L040B	39	40	100	10	3
	7	Int.	□	0890L090B	89	90	150	10	4
	11	Int.	□	0890L120B	119	120	180	10	4
	14	Int.	□	0890L150B	149	150	210	10	4
	20	Int.	□	0890L200B	199	200	260	10	4
	25	Int.	□	0890L250B	249	250	310	10	4
9.0	2	Int.	●	0900L040B	39	40	100	10	3
	7	Int.	●	0900L090B	89	90	150	10	4
	11	Int.	●	0900L120B	119	120	180	10	4
	14	Int.	●	0900L150B	149	150	210	10	4
	20	Int.	●	0900L200B	199	200	260	10	4
	25	Int.	●	0900L250B	249	250	310	10	4
9.1	2	Int.	□	0910L040B	39.5	40	100	10	3
	7	Int.	□	0910L090B	89.5	90	150	10	4
	11	Int.	□	0910L120B	119.5	120	180	10	4
	14	Int.	□	0910L150B	149.5	150	210	10	4
	19	Int.	□	0910L200B	199.5	200	260	10	4
	25	Int.	□	0910L250B	249.5	250	310	10	4
9.2	2	Int.	□	0920L040B	39.5	40	100	10	3
	7	Int.	□	0920L090B	89.5	90	150	10	4
	10	Int.	□	0920L120B	119.5	120	180	10	4
	14	Int.	□	0920L150B	149.5	150	210	10	4
	19	Int.	□	0920L200B	199.5	200	260	10	4
	25	Int.	□	0920L250B	249.5	250	310	10	4
9.3	2	Int.	□	0930L040B	39.5	40	100	10	3
	7	Int.	□	0930L090B	89.5	90	150	10	4
	10	Int.	□	0930L120B	119.5	120	180	10	4
	14	Int.	□	0930L150B	149.5	150	210	10	4
	19	Int.	□	0930L200B	199.5	200	260	10	4
	24	Int.	□	0930L250B	249.5	250	310	10	4
9.4	2	Int.	□	0940L040B	39.5	40	100	10	3
	7	Int.	□	0940L090B	89.5	90	150	10	4
	10	Int.	□	0940L120B	119.5	120	180	10	4
	13	Int.	□	0940L150B	149.5	150	210	10	4
	19	Int.	□	0940L200B	199.5	200	260	10	4
	24	Int.	□	0940L250B	249.5	250	310	10	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
9.5	2	Int.	●	MHS0950L040B	39.5	40	100	10	3
	7	Int.	●	0950L090B	89.5	90	150	10	4
	10	Int.	●	0950L120B	119.5	120	180	10	4
	13	Int.	●	0950L150B	149.5	150	210	10	4
	18	Int.	●	0950L200B	199.5	200	260	10	4
	24	Int.	●	0950L250B	249.5	250	310	10	4
	29	Int.	●	0950L300B	299.5	300	360	10	4
	9.6	2	Int.	□	0960L040B	40	40	100	10
7		Int.	□	0960L090B	90	90	150	10	4
10		Int.	□	0960L120B	120	120	180	10	4
13		Int.	□	0960L150B	150	150	210	10	4
18		Int.	□	0960L200B	200	200	260	10	4
24		Int.	□	0960L250B	250	250	310	10	4
29		Int.	□	0960L300B	300	300	360	10	4
9.7		2	Int.	□	0970L040B	40	40	100	10
	7	Int.	□	0970L090B	90	90	150	10	4
	10	Int.	□	0970L120B	120	120	180	10	4
	13	Int.	□	0970L150B	150	150	210	10	4
	18	Int.	□	0970L200B	200	200	260	10	4
	23	Int.	□	0970L250B	250	250	310	10	4
	28	Int.	□	0970L300B	300	300	360	10	4
	9.8	2	Int.	●	0980L040B	40	40	100	10
7		Int.	●	0980L090B	90	90	150	10	4
10		Int.	●	0980L120B	120	120	180	10	4
13		Int.	●	0980L150B	150	150	210	10	4
18		Int.	●	0980L200B	200	200	260	10	4
23		Int.	●	0980L250B	250	250	310	10	4
28		Int.	●	0980L300B	300	300	360	10	4
9.9		2	Int.	□	0990L040B	40	40	100	10
	7	Int.	□	0990L090B	90	90	150	10	4
	10	Int.	□	0990L120B	120	120	180	10	4
	13	Int.	□	0990L150B	150	150	210	10	4
	18	Int.	□	0990L200B	200	200	260	10	4
	23	Int.	□	0990L250B	250	250	310	10	4
	28	Int.	□	0990L300B	300	300	360	10	4
	10.0	1	Int.	●	1000L040B	40	40	100	10
6		Int.	●	1000L090B	90	90	150	10	4
9		Int.	●	1000L120B	120	120	180	10	4
12		Int.	●	1000L150B	150	150	210	10	4
17		Int.	●	1000L200B	200	200	260	10	4
22		Int.	●	1000L250B	250	250	310	10	4
27		Int.	●	1000L300B	300	300	360	10	4
10.1		1	Int.	□	1010L040B	38.5	40	100	12
	6	Int.	□	1010L090B	88.5	90	150	12	4
	9	Int.	□	1010L120B	118.5	120	180	12	4
	12	Int.	□	1010L150B	148.5	150	210	12	4
	17	Int.	□	1010L200B	198.5	200	260	12	4
	22	Int.	□	1010L250B	248.5	250	310	12	4
	27	Int.	□	1010L300B	298.5	300	360	12	4



Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.2	1	Int.	□	MHS1020L040B	38.5	40	100	12	3
	6	Int.	□	1020L090B	88.5	90	150	12	4
	9	Int.	□	1020L120B	118.5	120	180	12	4
	12	Int.	□	1020L150B	148.5	150	210	12	4
	17	Int.	□	1020L200B	198.5	200	260	12	4
	22	Int.	□	1020L250B	248.5	250	310	12	4
	27	Int.	□	1020L300B	298.5	300	360	12	4
10.3	1	Int.	□	1030L040B	38.5	40	100	12	3
	6	Int.	□	1030L090B	88.5	90	150	12	4
	9	Int.	□	1030L120B	118.5	120	180	12	4
	12	Int.	□	1030L150B	148.5	150	210	12	4
	17	Int.	□	1030L200B	198.5	200	260	12	4
	22	Int.	□	1030L250B	248.5	250	310	12	4
	26	Int.	□	1030L300B	298.5	300	360	12	4
10.4	1	Int.	□	1040L040B	38.5	40	100	12	3
	6	Int.	□	1040L090B	88.5	90	150	12	4
	9	Int.	□	1040L120B	118.5	120	180	12	4
	12	Int.	□	1040L150B	148.5	150	210	12	4
	17	Int.	□	1040L200B	198.5	200	260	12	4
	21	Int.	□	1040L250B	248.5	250	310	12	4
	26	Int.	□	1040L300B	298.5	300	360	12	4
10.5	1	Int.	●	1050L040B	38.5	40	100	12	3
	6	Int.	●	1050L090B	88.5	90	150	12	4
	9	Int.	●	1050L120B	118.5	120	180	12	4
	12	Int.	●	1050L150B	148.5	150	210	12	4
	16	Int.	●	1050L200B	198.5	200	260	12	4
	21	Int.	●	1050L250B	248.5	250	310	12	4
	26	Int.	●	1050L300B	298.5	300	360	12	4
10.6	1	Int.	□	1060L040B	39	40	100	12	3
	6	Int.	□	1060L090B	89	90	150	12	4
	9	Int.	□	1060L120B	119	120	180	12	4
	12	Int.	□	1060L150B	149	150	210	12	4
	16	Int.	□	1060L200B	199	200	260	12	4
	21	Int.	□	1060L250B	249	250	310	12	4
	26	Int.	□	1060L300B	299	300	360	12	4
10.7	1	Int.	□	1070L040B	39	40	100	12	3
	6	Int.	□	1070L090B	89	90	150	12	4
	9	Int.	□	1070L120B	119	120	180	12	4
	11	Int.	□	1070L150B	149	150	210	12	4
	16	Int.	□	1070L200B	199	200	260	12	4
	21	Int.	□	1070L250B	249	250	310	12	4
	25	Int.	□	1070L300B	299	300	360	12	4
10.8	1	Int.	●	1080L040B	39	40	100	12	3
	6	Int.	●	1080L090B	89	90	150	12	4
	9	Int.	●	1080L120B	119	120	180	12	4
	11	Int.	●	1080L150B	149	150	210	12	4
	16	Int.	●	1080L200B	199	200	260	12	4
	21	Int.	●	1080L250B	249	250	310	12	4
	25	Int.	●	1080L300B	299	300	360	12	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
10.9	1	Int.	□	MHS1090L040B	39	40	100	12	3
	6	Int.	□	1090L090B	89	90	150	12	4
	8	Int.	□	1090L120B	119	120	180	12	4
	11	Int.	□	1090L150B	149	150	210	12	4
	16	Int.	□	1090L200B	199	200	260	12	4
	20	Int.	□	1090L250B	249	250	310	12	4
	25	Int.	□	1090L300B	299	300	360	12	4
11.0	1	Int.	●	1100L040B	39	40	100	12	3
	6	Int.	●	1100L090B	89	90	150	12	4
	8	Int.	●	1100L120B	119	120	180	12	4
	11	Int.	●	1100L150B	149	150	210	12	4
	16	Int.	●	1100L200B	199	200	260	12	4
	20	Int.	●	1100L250B	249	250	310	12	4
	25	Int.	●	1100L300B	299	300	360	12	4
11.1	1	Int.	□	1110L040B	39.5	40	100	12	3
	6	Int.	□	1110L090B	89.5	90	150	12	4
	8	Int.	□	1110L120B	119.5	120	180	12	4
	11	Int.	□	1110L150B	149.5	150	210	12	4
	15	Int.	□	1110L200B	199.5	200	260	12	4
	20	Int.	□	1110L250B	249.5	250	310	12	4
	24	Int.	□	1110L300B	299.5	300	360	12	4
11.2	1	Int.	□	1120L040B	39.5	40	100	12	3
	5	Int.	□	1120L090B	89.5	90	150	12	4
	8	Int.	□	1120L120B	119.5	120	180	12	4
	11	Int.	□	1120L150B	149.5	150	210	12	4
	15	Int.	□	1120L200B	199.5	200	260	12	4
	20	Int.	□	1120L250B	249.5	250	310	12	4
	24	Int.	□	1120L300B	299.5	300	360	12	4
11.3	1	Int.	□	1130L040B	39.5	40	100	12	3
	5	Int.	□	1130L090B	89.5	90	150	12	4
	8	Int.	□	1130L120B	119.5	120	180	12	4
	11	Int.	□	1130L150B	149.5	150	210	12	4
	15	Int.	□	1130L200B	199.5	200	260	12	4
	20	Int.	□	1130L250B	249.5	250	310	12	4
	24	Int.	□	1130L300B	299.5	300	360	12	4
11.4	1	Int.	□	1140L040B	39.5	40	100	12	3
	5	Int.	□	1140L090B	89.5	90	150	12	4
	8	Int.	□	1140L120B	119.5	120	180	12	4
	11	Int.	□	1140L150B	149.5	150	210	12	4
	15	Int.	□	1140L200B	199.5	200	260	12	4
	19	Int.	□	1140L250B	249.5	250	310	12	4
	24	Int.	□	1140L300B	299.5	300	360	12	4
11.5	1	Int.	●	1150L040B	39.5	40	100	12	3
	5	Int.	●	1150L090B	89.5	90	150	12	4
	8	Int.	●	1150L120B	119.5	120	180	12	4
	10	Int.	●	1150L150B	149.5	150	210	12	4
	15	Int.	●	1150L200B	199.5	200	260	12	4
	19	Int.	●	1150L250B	249.5	250	310	12	4
	24	Int.	●	1150L300B	299.5	300	360	12	4

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



Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm)				Type
					Flute Length	Neck Length	Overall Length	Shank Dia.	
					L3	L2	L1	D4	
11.6	1	Int.	□	<b>MHS1160L040B</b>	40	40	100	12	3
	5	Int.	□	<b>1160L090B</b>	90	90	150	12	4
	8	Int.	□	<b>1160L120B</b>	120	120	180	12	4
	10	Int.	□	<b>1160L150B</b>	150	150	210	12	4
	15	Int.	□	<b>1160L200B</b>	200	200	260	12	4
	19	Int.	□	<b>1160L250B</b>	250	250	310	12	4
	23	Int.	□	<b>1160L300B</b>	300	300	360	12	4
11.7	1	Int.	□	<b>1170L040B</b>	40	40	100	12	3
	5	Int.	□	<b>1170L090B</b>	90	90	150	12	4
	8	Int.	□	<b>1170L120B</b>	120	120	180	12	4
	10	Int.	□	<b>1170L150B</b>	150	150	210	12	4
	15	Int.	□	<b>1170L200B</b>	200	200	260	12	4
	19	Int.	□	<b>1170L250B</b>	250	250	310	12	4
	23	Int.	□	<b>1170L300B</b>	300	300	360	12	4
11.8	1	Int.	●	<b>1180L040B</b>	40	40	100	12	3
	5	Int.	●	<b>1180L090B</b>	90	90	150	12	4
	8	Int.	●	<b>1180L120B</b>	120	120	180	12	4
	10	Int.	●	<b>1180L150B</b>	150	150	210	12	4
	14	Int.	●	<b>1180L200B</b>	200	200	260	12	4
	19	Int.	●	<b>1180L250B</b>	250	250	310	12	4
	23	Int.	●	<b>1180L300B</b>	300	300	360	12	4
11.9	1	Int.	□	<b>1190L040B</b>	40	40	100	12	3
	5	Int.	□	<b>1190L090B</b>	90	90	150	12	4
	8	Int.	□	<b>1190L120B</b>	120	120	180	12	4
	10	Int.	□	<b>1190L150B</b>	150	150	210	12	4
	14	Int.	□	<b>1190L200B</b>	200	200	260	12	4
	19	Int.	□	<b>1190L250B</b>	250	250	310	12	4
	23	Int.	□	<b>1190L300B</b>	300	300	360	12	4
12.0	1	Int.	●	<b>1200L040B</b>	40	40	100	12	3
	5	Int.	●	<b>1200L090B</b>	90	90	150	12	4
	7	Int.	●	<b>1200L120B</b>	120	120	180	12	4
	10	Int.	●	<b>1200L150B</b>	150	150	210	12	4
	14	Int.	●	<b>1200L200B</b>	200	200	260	12	4
	18	Int.	●	<b>1200L250B</b>	250	250	310	12	4
	22	Int.	●	<b>1200L300B</b>	300	300	360	12	4

### RECOMMENDED CUTTING CONDITIONS

V2.5

Work Material	Mild Steel ( $\leq 180\text{HB}$ ), Carbon Steel, Alloy Steel (180–280HB)				Ferritic and Martensitic Stainless Steel ( $>200\text{HB}$ )			
	SS400, S10C, S45C, SCM440				SUS431, SUS420J2			
Dia. (mm)	Cutting speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed (Min.–Max.) (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed (Min.–Max.) (mm/rev)	Feed rate (mm/min)
1	40	12700	0.030 (0.020–0.040)	380	20	6400	0.030 (0.020–0.040)	190
1.2	50	13300	0.035 (0.025–0.050)	465	30	8000	0.035 (0.025–0.050)	280
1.6	60	11900	0.050 (0.030–0.065)	595	40	8000	0.050 (0.030–0.065)	400
2	70	11100	0.060 (0.040–0.080)	665	50	8000	0.060 (0.040–0.080)	480
2.5	80	10200	0.075 (0.050–0.100)	765	60	7600	0.075 (0.050–0.100)	570
3.2	80	8000	0.100 (0.070–0.130)	800	60	6000	0.100 (0.070–0.130)	600
4	80	6400	0.100 (0.090–0.110)	640	60	4800	0.090 (0.080–0.090)	430
5	80	5100	0.130 (0.110–0.140)	665	60	3800	0.110 (0.100–0.120)	420
6.3	80	4000	0.160 (0.140–0.180)	640	60	3000	0.140 (0.130–0.150)	420
8	80	3200	0.200 (0.180–0.230)	640	60	2400	0.170 (0.160–0.190)	410
10	80	2600	0.250 (0.220–0.280)	650	60	1900	0.220 (0.200–0.230)	420
12	80	2100	0.300 (0.270–0.340)	630	60	1600	0.260 (0.240–0.280)	415

Work Material	Pre-Hardened Steel (35–45HRC), Alloy Steel, Tool Steel ( $\leq 350\text{HB}$ )				Hardened Steel (40–55HRC), Hardened Stainless Steel ( $<450\text{HB}$ )			
	NAK, PX5, SKD, SKT				SUS431, SUS420J2, SUS630, SUS631			
Dia. (mm)	Cutting speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed (Min.–Max.) (mm/rev)	Feed rate (mm/min)	Cutting speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed (Min.–Max.) (mm/rev)	Feed rate (mm/min)
1	20	6400	0.025 (0.020–0.030)	160	40	12700	0.020 (0.015–0.025)	255
1.2	30	8000	0.030 (0.020–0.035)	240	40	10600	0.025 (0.020–0.030)	265
1.6	40	8000	0.040 (0.030–0.045)	320	50	10000	0.035 (0.025–0.040)	350
2	50	8000	0.045 (0.035–0.060)	360	50	8000	0.040 (0.030–0.050)	320
2.5	60	7600	0.060 (0.045–0.075)	455	60	7600	0.050 (0.040–0.065)	380
3.2	60	6000	0.080 (0.060–0.090)	480	60	6000	0.060 (0.050–0.080)	360
4	60	4800	0.080 (0.070–0.100)	385	60	4800	0.080 (0.060–0.100)	385
5	60	3800	0.110 (0.090–0.130)	420	60	3800	0.100 (0.080–0.130)	380
6.3	60	3000	0.130 (0.110–0.160)	390	60	3000	0.110 (0.090–0.130)	330
8	60	2400	0.170 (0.140–0.200)	410	60	2400	0.140 (0.120–0.160)	335
10	60	1900	0.210 (0.170–0.250)	400	60	1900	0.170 (0.140–0.200)	325
12	60	1600	0.250 (0.210–0.300)	400	60	1600	0.210 (0.170–0.240)	335

Work Material	Hardened Steel (40–55HRC), Heat Resistant Alloy			
	SKD61, SKT4, Inconel718			
Dia. (mm)	Cutting speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed (Min.–Max.) (mm/rev)	Feed rate (mm/min)
1	10	3200	0.015 (0.015–0.020)	50
1.2	10	2700	0.020 (0.015–0.025)	55
1.6	10	2000	0.025 (0.020–0.030)	50
2	20	3200	0.035 (0.025–0.040)	110
2.5	20	2600	0.040 (0.030–0.050)	105
3.2	20	2000	0.050 (0.040–0.070)	100
4	30	2400	0.070 (0.050–0.080)	170
5	30	1900	0.080 (0.060–0.100)	150
6.3	30	1500	0.090 (0.080–0.110)	135
8	40	1600	0.120 (0.100–0.130)	190
10	40	1300	0.150 (0.130–0.170)	195
12	40	1100	0.180 (0.150–0.200)	200

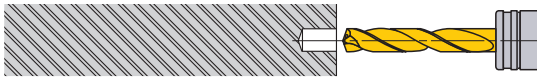
(Note 1) When using the drill with a length over  $l/d$  10, it is necessary to use a pilot hole as a guide. (If no pilot hole is used then drill breakage can occur)

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

## OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D $\geq$ 10)

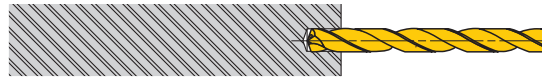
### FLAT FACE DRILLING ●Drilling a blind hole

#### 1. Drilling a pilot hole



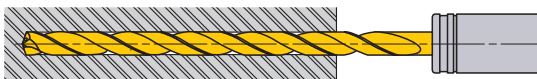
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.  
(Adjust the pilot hole depth according to the length of the long type drill.)

#### 2. Initial cutting with the long type drill



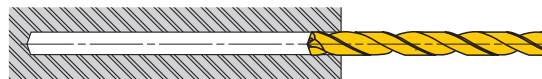
- ① Penetrate the guide hole at low revolution.  
(Revolution 1000min<sup>-1</sup>, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1mm short of the guide hole bottom.

#### 3. Drill the deep hole



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

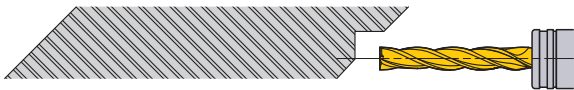
#### 4. Drill retraction



- ① After drilling, lower the cutting revolution about 0.5–1mm short of the hole end. (Revolution 1000min<sup>-1</sup>)
- ② Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
- ③ Finally, clear the hole at a cutting speed of 20–30m/min and feed rate of 0.2–0.3mm/rev.

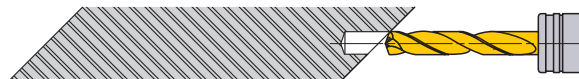
### INTERRUPTED DRILLING ●Drilling and breaking through on irregular faces or angles

#### 1. Spot facing



- ① Machine 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



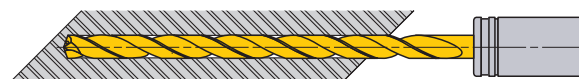
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D.  
(Adjust the pilot hole depth according to the length of the long type drill.)

#### 3. Initial cutting with the long type drill



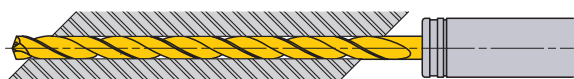
- ① Penetrate the guide hole at a low revolution.  
(Revolution 1000min<sup>-1</sup>, feed rate 0.2–0.3mm/rev)
- ② Stop the long type drill 0.5–1mm short of the guide hole bottom.

#### 4. Drill the deep hole



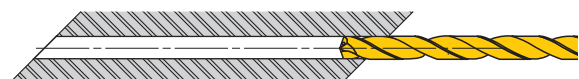
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
- ② Feed as usual until breaking through.

#### 5. Breaking through



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

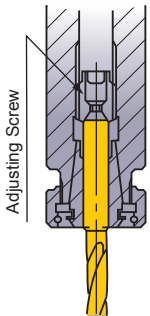
#### 6. Drill retraction



- ① Finally clear the hole at a revolution speed 1000min<sup>-1</sup> and feed rate of 0.2–0.3mm/rev.
- ② Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.

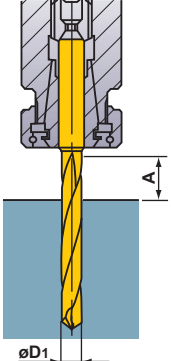
## OPERATIONAL GUIDANCE

### Drill Holding



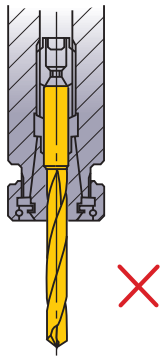
Thrust bearing type collet chuck holds the drill securely.

### Drill Length



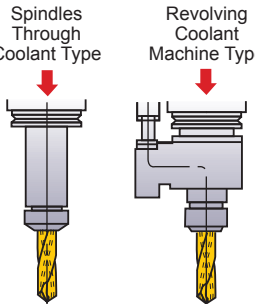
$A \geq D1 \times 1.5$

### Drill Installation



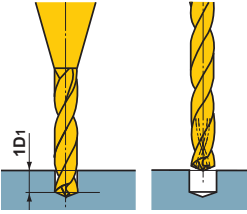
Do not clamp on the flutes.

### Through Coolant Type



Less than  $\phi 3$  : 1.5MPa-7MP  
More than  $\phi 3$  : 0.5MPa-7MPa  
More than 3MPa is recommended.

### Drill Installation

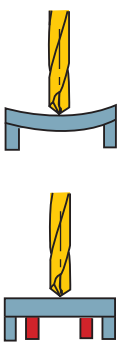


- ① Drill a prepared hole about  $1D1$  using the shortest flute length of MHS. ( $D1$ =drill diameter)
- ② Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

### 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.

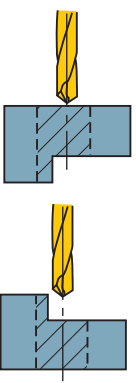
### Thin Workpiece



If Bending Occurs

Support the Workpiece

### Interrupted Cutting



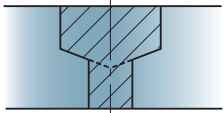
One Process

① Lower the feed when drilling the interrupted part.

Requires Prior Machining

① Spot face with an end mill prior to drilling.

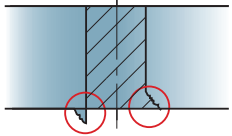
### Stepped Holes



- ① Divide the two processes.
- ② Drill the larger hole first.

\* A tool for machining both chamfer and spot face can be produced to order.

### Burring and Workpiece Chipping



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

#### 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 using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc. ●Grinding or heating of cutting tools produces dust and mist. Inhaling large amount of dust or contacting with eyes and skins may harm your body.

# MITSUBISHI MATERIALS CORPORATION

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