

Solid Carbide Drill for Die &amp; Mould Machining WSTAR Drill Series

# MHS

Inventory Item  
Expansion

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.

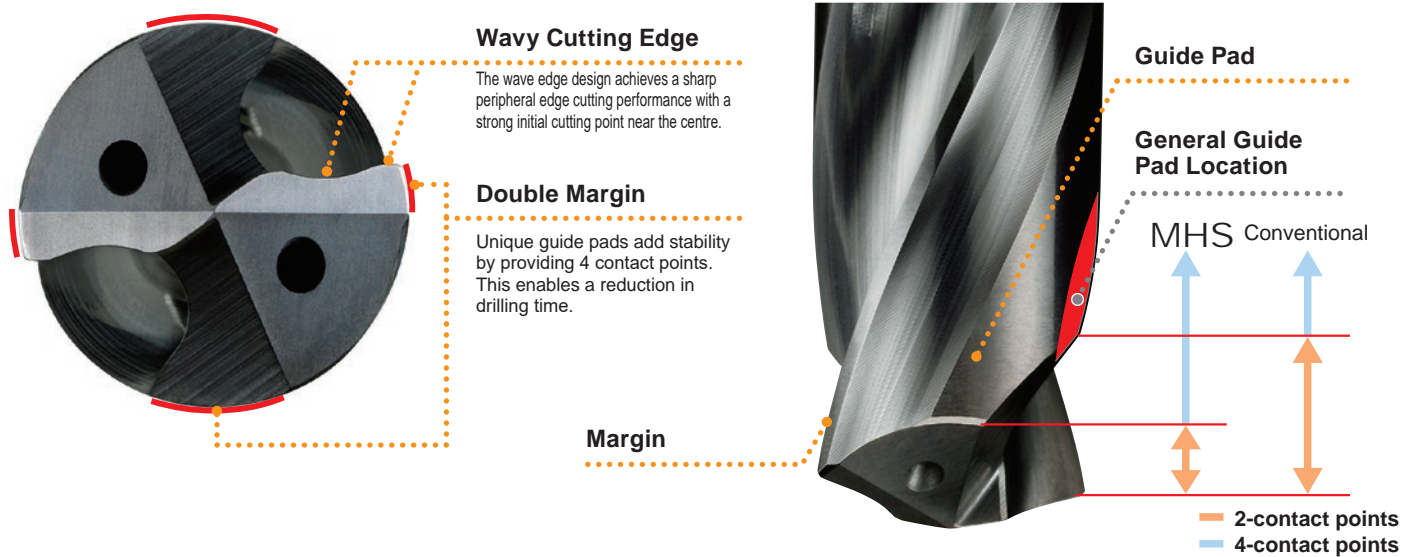


# Solid Carbide Drill for Die & Mould Machining

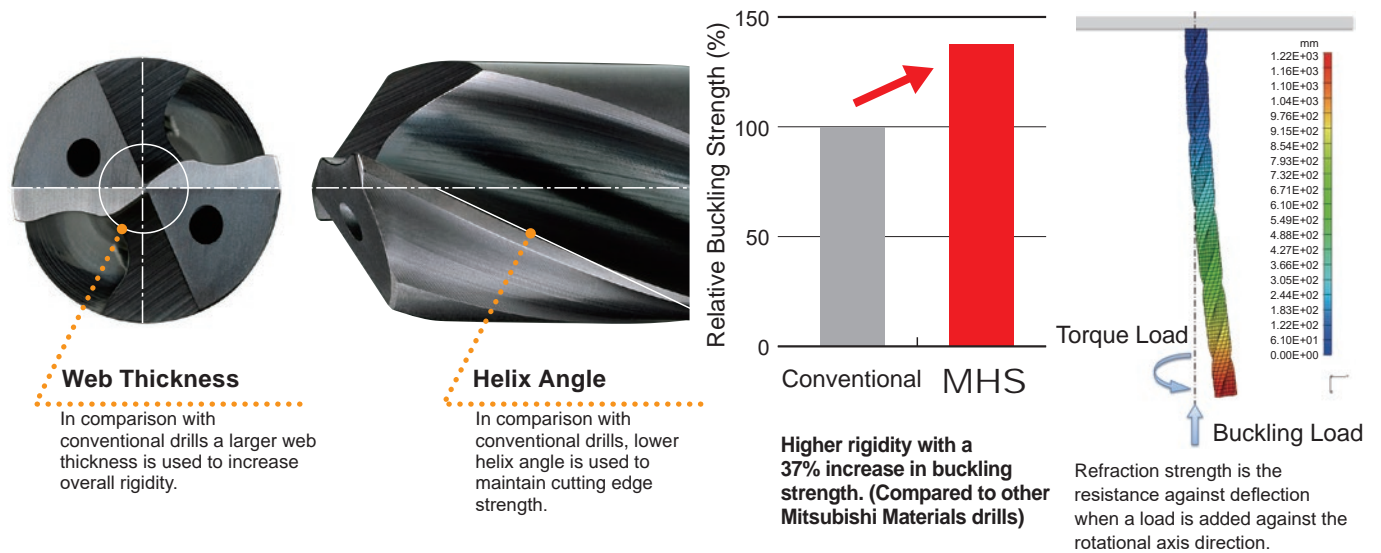
## WSTAR Drill Series

# MHS

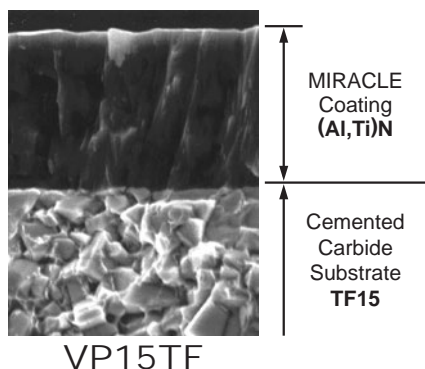
### Stable Machining for the Unique Cutting Edge Geometry & Double Margin Flute



### Strong Geometry for Stable Machining of Moulds



### Long Tool Life Miracle Coated VP15TF



**MIRACLE Coated**

#### Features of VP15TF

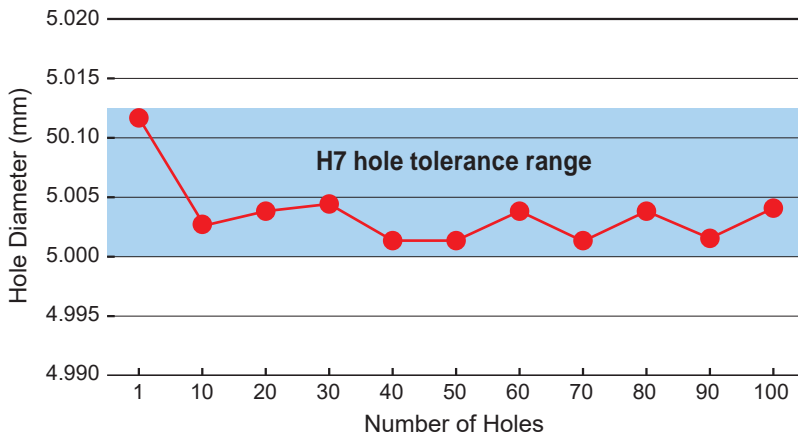
MIRACLE coated VP15TF is suitable for machining of 35–55HRC mould materials.

**Tough Carbide Grade**

# Cutting Performance

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

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

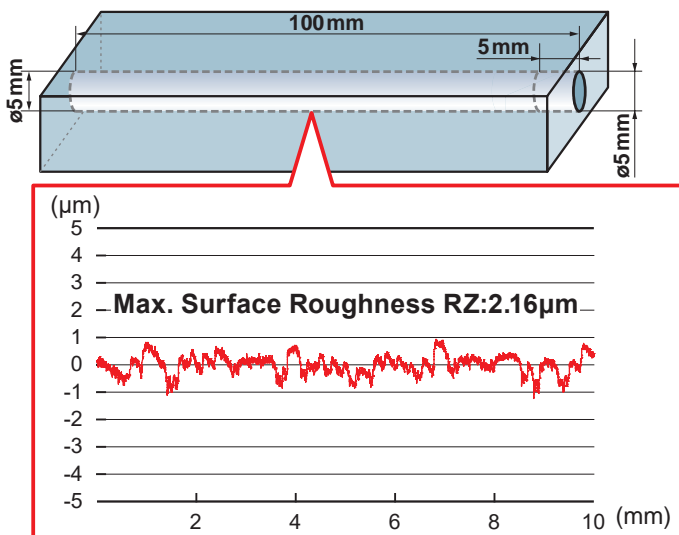


<Cutting Conditions>  
 Workpiece Material : DH31S (48-50HRC)  
 Tool : MHS0500L090B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 70 mm (l=DCx14)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.15 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting  
 (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

<Cutting Conditions for Pilot Drilling>  
 Tool : MHS0500L020B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 5 mm (l=DC)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.15 mm/rev

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

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

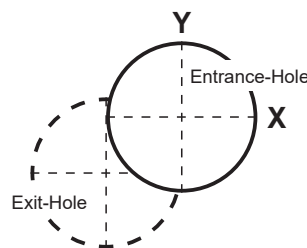
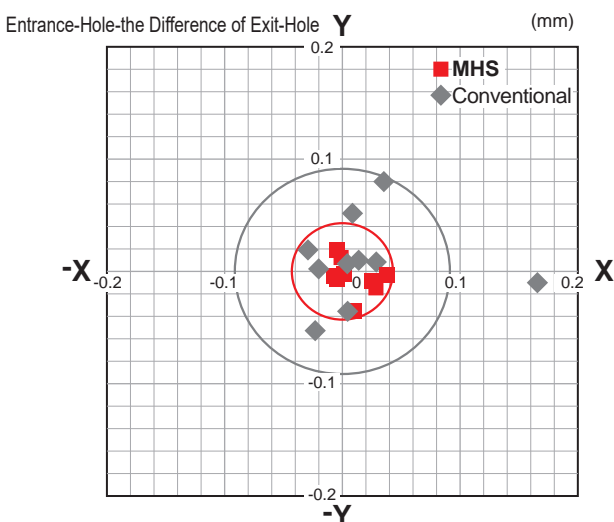


<Cutting Conditions>  
 Workpiece Material : JIS SKD11 (48-50HRC)  
 Tool : MHS0500L120B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 100 mm Through Hole (l=DCx20)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.10 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting  
 (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

<Cutting Conditions for Pilot Drilling>  
 Tool : MHS0500L020B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 5 mm (l=DC)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.10 mm/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.

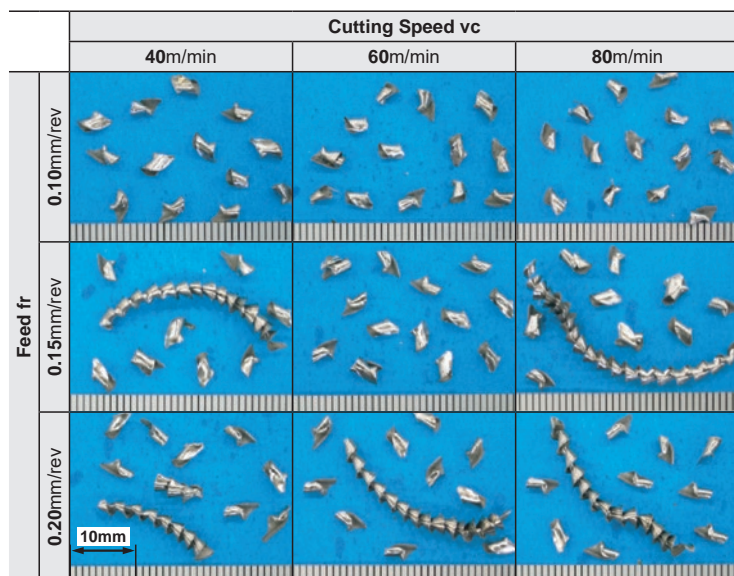
<Cutting Conditions>  
 Workpiece Material : JIS SKD11 (17HRC)  
 Tool : MHS0100L035B  
 Drill Dia. : DC=ø1 mm  
 Hole Depth : 25 mm Through Hole (l=DCx25)  
 Cutting Speed : vc=40 m/min  
 Feed per Rev. : fr=0.04 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting  
 (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

<Cutting Conditions for Pilot Drilling>  
 Tool : MHS0100L006B  
 Drill Dia. : DC=ø1 mm  
 Hole Depth : 2 mm (l=DCx2)  
 Cutting Speed : vc=50 m/min  
 Feed per Rev. : fr=0.04 mm/rev



## High Efficiency Drilling (continuous feed) (40HRC)

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



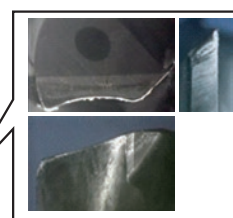
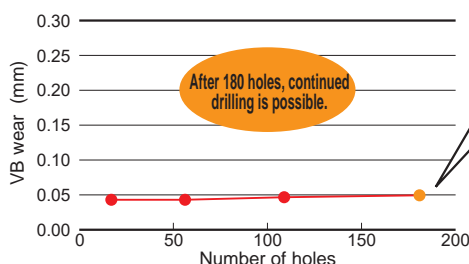
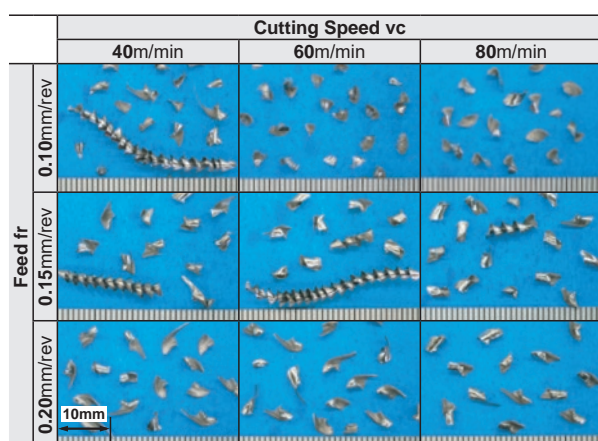
<Cutting Conditions>

Workpiece Material : CENA1 (40HRC)  
 Tool : MHS0600L150B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 115 mm (l=DCx19)  
 Cutting Speed : vc=60 m/min  
 Feed per Rev. : fr=0.15 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting  
 (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

<Cutting Conditions for Pilot Drilling>

Tool : MHS0600L030B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 6 mm (l=DC)  
 Cutting Speed : vc=60 m/min  
 Feed per Rev. : fr=0.15 mm/rev

## Cutting Performance for Different Workpiece Material STAVAX (33HRC)



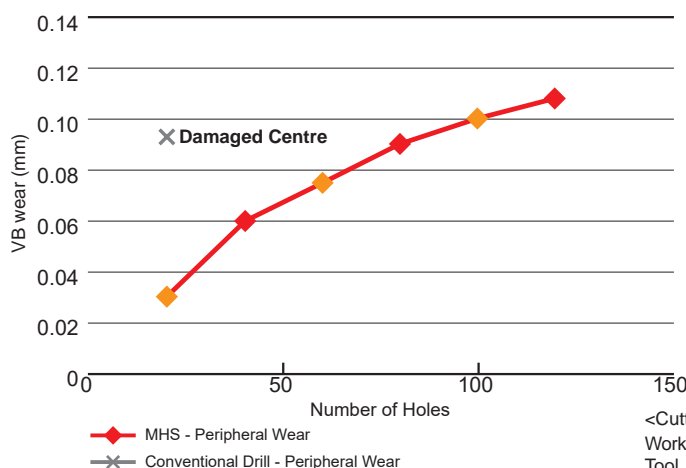
<Cutting Conditions>

Workpiece Material : STAVAX (33HRC)  
 Tool : MHS0600L150B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 115 mm (l=DCx19)  
 Cutting Speed : vc=40 m/min  
 Feed per Rev. : fr=0.15 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting  
 (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

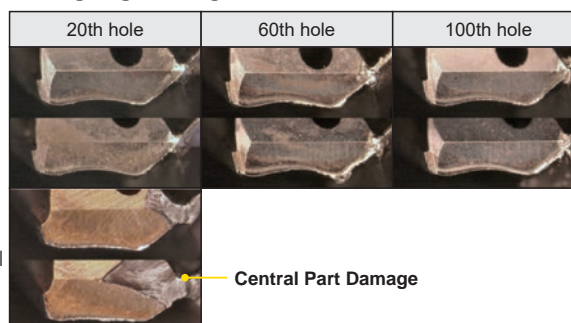
<Cutting Conditions for Pilot Drilling>

Tool : MHS0600L030B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 6 mm (l=DC)  
 Cutting Speed : vc=40 m/min  
 Feed per Rev. : fr=0.15 mm/rev

## STAVAX ESR (52HRC)



### Cutting Edge Damage



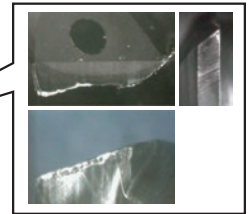
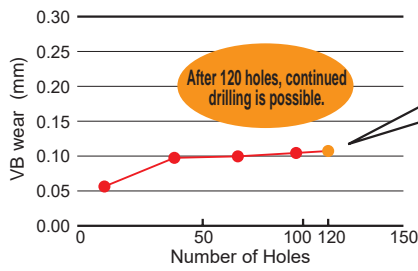
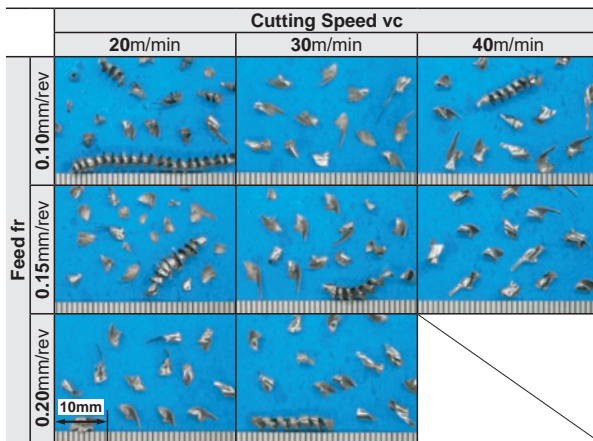
<Cutting Conditions>

Workpiece Material : STAVAX ESR (52 HRC)  
 Tool : MHS0200L065B  
 Drill Dia. : DC=ø2 mm  
 Hole Depth : 50 mm (l=DCx25)  
 Cutting Speed : vc=50 m/min  
 Feed per Rev. : fr=0.04 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

<Cutting Conditions for Pilot Drilling>

Tool : MHS0200L010B  
 Drill Dia. : DC=ø2 mm  
 Hole Depth : 4 mm (l=DCx2)  
 Cutting Speed : vc=50 m/min  
 Feed per Rev. : fr=0.04 mm/rev

# DAC55 (45HRC)



**<Cutting Conditions>**

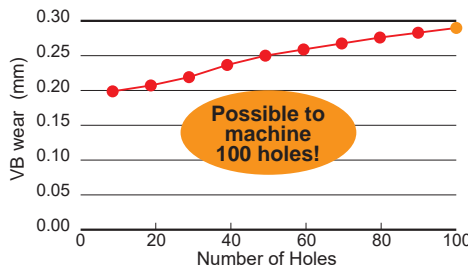
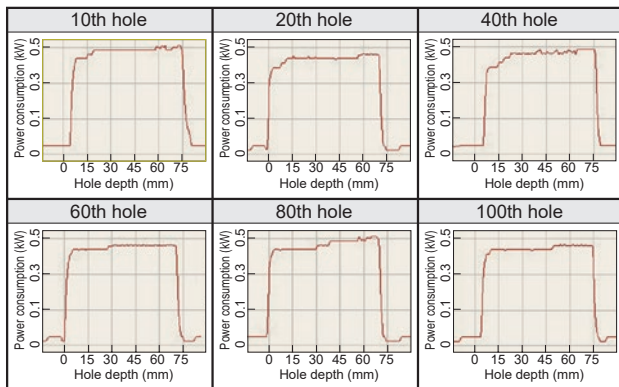
Workpiece Material : DAC55 (45HRC)  
 Tool : MHS0600L150B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 115 mm (l=DCx19)  
 Cutting Speed : vc=30m/min  
 Feed per Rev. : fr=0.10mm/rev (Continuous)  
 Cutting Mode : Wet Cutting (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

**<Cutting Conditions for Pilot Drilling>**

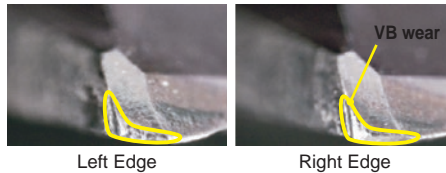
Tool : MHS0600L030B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 6 mm (l=DCx2)  
 Cutting Speed : vc=30m/min  
 Feed per Rev. : fr=0.10mm/rev

# DH31S (50HRC)

**Consistent Power Consumption**



VB wear after machining 100 holes



**<Cutting Conditions>**

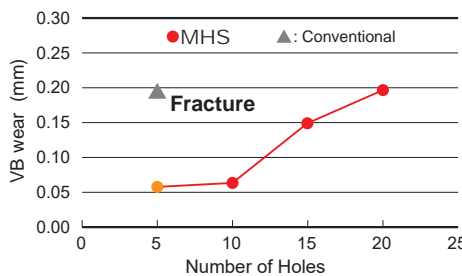
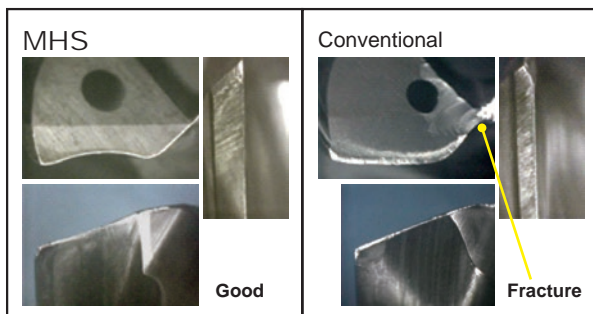
Workpiece Material : DH31S (50 HRC)  
 Tool : MHS0500L090B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 70 mm (l=DCx14)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.10 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

**<Cutting Conditions for Pilot Drilling>**

Tool : MHS0500L020B  
 Drill Dia. : DC=ø5 mm  
 Hole Depth : 5 mm (l=DC)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.16 mm/rev

# SKD11 (55HRC)

**Cutting Edges After Machining 5 Holes**



**<Cutting Conditions>**

Workpiece Material : JIS SKD11(55HRC)  
 Tool : MHS0600L120B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 95 mm (l=DCx16)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.05 mm/rev (Continuous)  
 Cutting Mode : Wet Cutting (Internal Coolant  
 Water-soluble Coolants 2MPa)  
 Machine : Vertical MC

**<Cutting Conditions for Pilot Drilling>**

Tool : MHS0600L030B  
 Drill Dia. : DC=ø6 mm  
 Hole Depth : 6 mm (l=DC)  
 Cutting Speed : vc=20 m/min  
 Feed per Rev. : fr=0.05 mm/rev

# Solid Carbide Drill for Die & Mould Machining

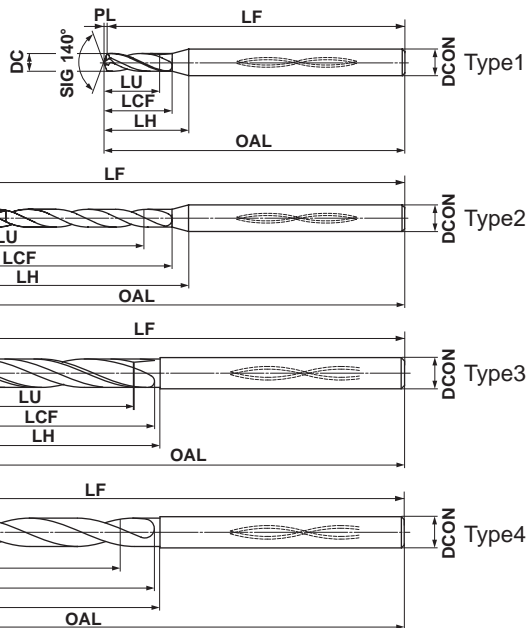
## MHS WSTAR DRILLS

- High backing strength and unique double margin.
- Non-step drilling with long tool life for high hardness steel, 35HRC-55HRC



P M K N S H

Internal Coolant



	DC ≤ 3	3 < DC ≤ 6	6 < DC ≤ 10	10 < DC ≤ 12
	+0.010 -0.002	+0.010 -0.002	+0.010 -0.005	+0.010 -0.008
	DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 12
$h_6$	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.

DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
0.95	3	●	MHS0095L006B	3.0	6.2	10.0	60.2	60	0.17	3	1
0.95	6	●	MHS0095L009B	5.9	9.2	13.0	60.2	60	0.17	3	2
0.95	13	●	MHS0095L015B	12.5	15.2	19.0	60.2	60	0.17	3	2
0.95	23	●	MHS0095L025B	22.0	25.2	29.0	60.2	60	0.17	3	2
0.95	30	●	MHS0095L035B	28.7	35.2	39.0	80.2	80	0.17	3	2
1.00	3	●	MHS0100L006B	3.2	6.2	9.9	60.2	60	0.2	3	1
1.00	6	●	MHS0100L009B	6.2	9.2	12.9	60.2	60	0.2	3	2
1.00	12	●	MHS0100L015B	12.2	15.2	18.9	60.2	60	0.2	3	2
1.00	22	●	MHS0100L025B	22.2	25.2	28.9	60.2	60	0.2	3	2
1.00	30	●	MHS0100L035B	30.2	35.2	38.9	80.2	80	0.2	3	2
1.10	2	●	MHS0110L006B	2.4	6.2	9.7	60.2	60	0.2	3	1
1.10	5	●	MHS0110L009B	5.7	9.2	12.7	60.2	60	0.2	3	2
1.10	11	●	MHS0110L015B	12.3	15.2	18.7	60.2	60	0.2	3	2
1.10	20	●	MHS0110L025B	22.2	25.2	28.7	60.2	60	0.2	3	2
1.10	29	●	MHS0110L035B	32.1	35.2	38.7	80.2	80	0.2	3	2
1.20	2	●	MHS0120L006B	2.6	6.2	9.6	60.2	60	0.2	3	1
1.20	5	●	MHS0120L009B	6.2	9.2	12.6	60.2	60	0.2	3	2
1.20	10	●	MHS0120L015B	12.2	15.2	18.6	60.2	60	0.2	3	2
1.20	18	●	MHS0120L025B	21.8	25.2	28.6	60.2	60	0.2	3	2
1.20	26	●	MHS0120L035B	31.4	35.2	38.6	80.2	80	0.2	3	2
1.30	2	●	MHS0130L007B	2.8	7.2	10.4	60.2	60	0.2	3	1
1.30	5	●	MHS0130L011B	6.8	11.3	14.5	60.3	60	0.3	3	2
1.30	12	●	MHS0130L020B	15.9	20.3	23.5	60.3	60	0.3	3	2
1.30	20	●	MHS0130L030B	26.3	30.3	33.5	80.3	80	0.3	3	2

DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
1.30	30	●	MHS0130L045B	39.3	45.3	48.5	80.3	80	0.3	3	2
1.40	2	●	MHS0140L007B	3.1	7.3	10.3	60.3	60	0.3	3	1
1.40	5	●	MHS0140L011B	7.3	11.3	14.3	60.3	60	0.3	3	2
1.40	11	●	MHS0140L020B	15.7	20.3	23.3	60.3	60	0.3	3	2
1.40	18	●	MHS0140L030B	25.5	30.3	33.3	80.3	80	0.3	3	2
1.40	29	●	MHS0140L045B	40.9	45.3	48.3	80.3	80	0.3	3	2
1.45	3	●	MHS0145L008B	4.7	8.3	11.2	60.3	60	0.3	3	1
1.45	6	●	MHS0145L013B	9.0	13.3	16.2	60.3	60	0.3	3	2
1.45	11	●	MHS0145L020B	16.3	20.3	23.2	60.3	60	0.3	3	2
1.45	21	●	MHS0145L035B	30.8	35.3	38.2	80.3	80	0.3	3	2
1.45	30	●	MHS0145L055B	43.8	55.3	58.2	100.3	100	0.3	3	2
1.50	2	●	MHS0150L008B	3.3	8.3	11.1	60.3	60	0.3	3	1
1.50	6	●	MHS0150L013B	9.3	13.3	16.1	60.3	60	0.3	3	2
1.50	10	●	MHS0150L020B	15.3	20.3	23.1	60.3	60	0.3	3	2
1.50	20	●	MHS0150L035B	30.3	35.3	38.1	80.3	80	0.3	3	2
1.50	30	●	MHS0150L055B	45.3	55.3	58.1	100.3	100	0.3	3	2
1.60	2	●	MHS0160L008B	3.5	8.3	10.9	60.3	60	0.3	3	1
1.60	5	●	MHS0160L013B	8.3	13.3	15.9	60.3	60	0.3	3	2
1.60	10	●	MHS0160L020B	16.3	20.3	22.9	60.3	60	0.3	3	2
1.60	19	●	MHS0160L035B	30.7	35.3	37.9	80.3	80	0.3	3	2
1.60	30	●	MHS0160L055B	48.3	55.3	57.9	100.3	100	0.3	3	2
1.70	2	●	MHS0170L008B	3.7	8.3	10.7	60.3	60	0.3	3	1
1.70	5	●	MHS0170L013B	8.9	13.4	15.8	60.4	60	0.4	3	2
1.70	9	●	MHS0170L020B	15.7	20.4	22.8	60.4	60	0.4	3	2

Note 1) 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.



(mm)

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
1.70	18	●	MHS0170L035B	31.0	35.4	37.8	80.4	80	0.4	3	2
1.70	29	●	MHS0170L055B	49.7	55.4	57.8	100.4	100	0.4	3	2
1.80	3	●	MHS0180L010B	5.7	10.3	12.5	60.3	60	0.3	3	1
1.80	5	●	MHS0180L015B	9.4	15.4	17.6	60.4	60	0.4	3	2
1.80	11	●	MHS0180L025B	20.2	25.4	27.6	60.4	60	0.4	3	2
1.80	22	●	MHS0180L045B	40.0	45.4	47.6	80.4	80	0.4	3	2
1.80	30	●	MHS0180L065B	54.4	65.4	67.6	100.4	100	0.4	3	2
1.90	2	●	MHS0190L010B	4.1	10.3	12.4	60.3	60	0.3	3	1
1.90	5	●	MHS0190L015B	9.9	15.4	17.5	60.4	60	0.4	3	2
1.90	10	●	MHS0190L025B	19.4	25.4	27.5	60.4	60	0.4	3	2
1.90	21	●	MHS0190L045B	40.3	45.4	47.5	80.4	80	0.4	3	2
1.90	30	●	MHS0190L065B	57.4	65.4	67.5	100.4	100	0.4	3	2
1.95	2	●	MHS0195L010B	4.3	10.4	12.4	60.4	60	0.4	3	1
1.95	5	●	MHS0195L015B	10.2	15.4	17.4	60.4	60	0.4	3	2
1.95	10	●	MHS0195L025B	19.9	25.4	27.4	60.4	60	0.4	3	2
1.95	20	●	MHS0195L045B	39.4	45.4	47.4	80.4	80	0.4	3	2
1.95	30	●	MHS0195L065B	58.9	65.4	67.4	100.4	100	0.4	3	2
2.00	2	●	MHS0200L010B	4.4	10.4	12.3	60.4	60	0.4	3	1
2.00	5	●	MHS0200L015B	10.4	15.4	17.3	60.4	60	0.4	3	2
2.00	9	●	MHS0200L025B	18.4	25.4	27.3	60.4	60	0.4	3	2
2.00	20	●	MHS0200L045B	40.4	45.4	47.3	80.4	80	0.4	3	2
2.00	30	●	MHS0200L065B	60.4	65.4	67.3	100.4	100	0.4	3	2
2.10	3	●	MHS0210L012B	6.7	12.4	14.1	60.4	60	0.4	3	1
2.10	7	●	MHS0210L020B	15.1	20.4	22.1	60.4	60	0.4	3	2
2.10	11	●	MHS0210L030B	23.5	30.4	32.1	80.4	80	0.4	3	2
2.10	23	●	MHS0210L055B	48.7	55.4	57.1	100.4	100	0.4	3	2
2.10	30	●	MHS0210L075B	63.4	75.4	77.1	120.4	120	0.4	3	2
2.20	2	●	MHS0220L012B	4.8	12.4	13.9	60.4	60	0.4	3	1
2.20	6	●	MHS0220L020B	13.7	20.5	22.0	60.5	60	0.5	3	2
2.20	11	●	MHS0220L030B	24.7	30.5	32.0	80.5	80	0.5	3	2
2.20	22	●	MHS0220L055B	48.9	55.5	57.0	100.5	100	0.5	3	2
2.20	30	●	MHS0220L075B	66.5	75.5	77.0	120.5	120	0.5	3	2
2.30	2	●	MHS0230L012B	5.0	12.4	13.7	60.4	60	0.4	3	1
2.30	6	●	MHS0230L020B	14.3	20.5	21.8	60.5	60	0.5	3	2
2.30	10	●	MHS0230L030B	23.5	30.5	31.8	80.5	80	0.5	3	2
2.30	21	●	MHS0230L055B	48.8	55.5	56.8	100.5	100	0.5	3	2
2.30	30	●	MHS0230L075B	69.5	75.5	76.8	120.5	120	0.5	3	2
2.40	2	●	MHS0240L012B	5.2	12.4	13.5	60.4	60	0.4	3	1
2.40	5	●	MHS0240L020B	12.5	20.5	21.6	60.5	60	0.5	3	2
2.40	9	●	MHS0240L030B	22.1	30.5	31.6	80.5	80	0.5	3	2
2.40	20	●	MHS0240L055B	48.5	55.5	56.6	100.5	100	0.5	3	2
2.40	28	●	MHS0240L075B	67.7	75.5	76.6	120.5	120	0.5	3	2
2.45	2	●	MHS0245L013B	5.3	13.4	14.4	70.4	70	0.4	4	1
2.45	5	●	MHS0245L020B	12.8	20.5	21.5	70.5	70	0.5	4	2
2.45	11	●	MHS0245L035B	27.5	35.5	36.5	90.5	90	0.5	4	2
2.45	24	●	MHS0245L065B	59.3	65.5	66.5	110.5	110	0.5	4	2
2.45	30	●	MHS0245L090B	74.0	90.5	91.5	140.5	140	0.5	4	2
2.50	2	●	MHS0250L013B	5.5	13.5	16.3	70.5	70	0.5	4	1

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
2.50	5	●	MHS0250L020B	13.0	20.5	23.3	70.5	70	0.5	4	2
2.50	11	●	MHS0250L035B	28.0	35.5	38.3	90.5	90	0.5	4	2
2.50	23	●	MHS0250L065B	58.0	65.5	68.3	110.5	110	0.5	4	2
2.50	30	●	MHS0250L090B	75.5	90.5	93.3	140.5	140	0.5	4	2
2.60	2	●	MHS0260L013B	5.7	13.5	16.1	70.5	70	0.5	4	1
2.60	5	●	MHS0260L020B	13.5	20.5	23.1	70.5	70	0.5	4	2
2.60	10	●	MHS0260L035B	26.5	35.5	38.1	90.5	90	0.5	4	2
2.60	22	●	MHS0260L065B	57.7	65.5	68.1	110.5	110	0.5	4	2
2.60	30	●	MHS0260L090B	78.5	90.5	93.1	140.5	140	0.5	4	2
2.70	2	●	MHS0270L013B	5.9	13.5	15.9	70.5	70	0.5	4	1
2.70	4	●	MHS0270L020B	11.4	20.6	23.0	70.6	70	0.6	4	2
2.70	10	●	MHS0270L035B	27.6	35.6	38.0	90.6	90	0.6	4	2
2.70	21	●	MHS0270L065B	57.3	65.6	68.0	110.6	110	0.6	4	2
2.70	30	●	MHS0270L090B	81.6	90.6	93.0	140.6	140	0.6	4	2
2.80	2	●	MHS0280L014B	6.1	14.5	16.7	70.5	70	0.5	4	1
2.80	4	●	MHS0280L020B	11.8	20.6	22.8	70.6	70	0.6	4	2
2.80	9	●	MHS0280L035B	25.8	35.6	37.8	90.6	90	0.6	4	2
2.80	20	●	MHS0280L065B	56.6	65.6	67.8	110.6	110	0.6	4	2
2.80	29	●	MHS0280L090B	81.8	90.6	92.8	140.6	140	0.6	4	2
2.90	2	●	MHS0290L014B	6.3	14.5	16.6	70.5	70	0.5	4	1
2.90	4	●	MHS0290L020B	12.2	20.6	22.7	70.6	70	0.6	4	2
2.90	9	●	MHS0290L035B	26.7	35.6	37.7	90.6	90	0.6	4	2
2.90	19	●	MHS0290L065B	55.7	65.6	67.7	110.6	110	0.6	4	2
2.90	28	●	MHS0290L090B	81.8	90.6	92.7	140.6	140	0.6	4	2
2.95	2	●	MHS0295L014B	6.4	14.5	16.5	70.5	70	0.5	4	1
2.95	4	●	MHS0295L020B	12.4	20.6	22.6	70.6	70	0.6	4	2
2.95	9	●	MHS0295L035B	27.2	35.6	37.6	90.6	90	0.6	4	2
2.95	19	●	MHS0295L065B	56.7	65.6	67.6	110.6	110	0.6	4	2
2.95	28	●	MHS0295L090B	83.2	90.6	92.6	140.6	140	0.6	4	2
3.0	4	●	MHS0300L020B	12.5	19.5	20.5	70.5	70	0.5	4	3
3.0	10	●	MHS0300L040B	30.5	39.5	40.5	90.5	90	0.5	4	4
3.0	17	●	MHS0300L060B	51.5	59.5	60.5	110.5	110	0.5	4	4
3.0	27	●	MHS0300L090B	81.5	89.5	90.5	140.5	140	0.5	4	4
3.1	4	□	MHS0310L020B	12.9	20.0	20.5	70.5	70	0.5	4	3
3.1	10	□	MHS0310L040B	31.6	40.1	40.6	90.6	90	0.6	4	4
3.1	17	□	MHS0310L060B	53.3	60.1	60.6	110.6	110	0.6	4	4
3.1	26	□	MHS0310L090B	81.2	90.1	90.6	140.6	140	0.6	4	4
3.2	4	□	MHS0320L020B	13.4	20.1	20.6	70.6	70	0.6	4	3
3.2	10	□	MHS0320L040B	32.6	40.1	40.6	90.6	90	0.6	4	4
3.2	16	□	MHS0320L060B	51.8	60.1	60.6	110.6	110	0.6	4	4
3.2	25	□	MHS0320L090B	80.6	90.1	90.6	140.6	140	0.6	4	4
3.3	3	□	MHS0330L020B	10.5	20.1	20.6	70.6	70	0.6	4	3
3.3	9	□	MHS0330L040B	30.3	40.1	40.6	90.6	90	0.6	4	4
3.3	16	□	MHS0330L060B	53.4	60.1	60.6	110.6	110	0.6	4	4
3.3	25	□	MHS0330L090B	83.1	90.1	90.6	140.6	140	0.6	4	4
3.4	3	□	MHS0340L020B	10.8	20.1	20.6	70.6	70	0.6	4	3
3.4	9	□	MHS0340L040B	31.2	40.1	40.6	90.6	90	0.6	4	4
3.4	15	□	MHS0340L060B	51.6	60.1	60.6	110.6	110	0.6	4	4

DC = Cutting Diameter  
LU = Usable Length  
LCF = Length Chip Flute

LH = Neck Length  
OAL = Overall Length  
LF = Functional Length

PL = Point Length  
DCON = Connection Diameter

# MHS

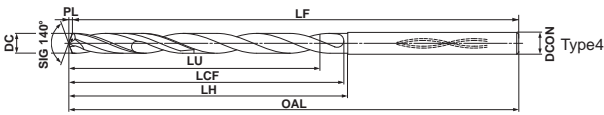
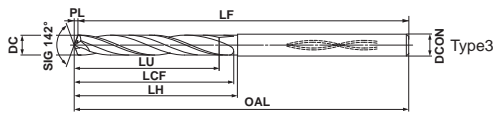
## WSTAR DRILLS

DC	Hole Depth (L/D)	VP15TF	Order Number									(mm)											
				LU	LCF	LH	OAL	LF	PL	DCON	Type	DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
3.4	24	□	MHS0340L090B	82.2	90.1	90.6	140.6	140	0.6	4	4	4.4	18	□	MHS0440L090B	80.0	89.3	90.8	140.8	140	0.8	6	4
3.5	3	●	MHS0350L020B	11.1	20.1	20.6	70.6	70	0.6	4	3	4.4	24	□	MHS0440L120B	106.4	119.3	120.8	170.8	170	0.8	6	4
3.5	9	●	MHS0350L040B	32.1	40.1	40.6	90.6	90	0.6	4	4	4.5	2	●	MHS0450L020B	9.8	19.3	20.8	70.8	70	0.8	6	3
3.5	14	●	MHS0350L060B	49.6	60.1	60.6	110.6	110	0.6	4	4	4.5	6	●	MHS0450L040B	27.8	39.3	40.8	90.8	90	0.8	6	4
3.5	23	●	MHS0350L090B	81.1	90.1	90.6	140.6	140	0.6	4	4	4.5	10	●	MHS0450L060B	45.8	59.3	60.8	110.8	110	0.8	6	4
3.6	3	□	MHS0360L020B	11.4	20.6	20.6	70.6	70	0.6	4	3	4.5	17	●	MHS0450L090B	77.3	89.3	90.8	140.8	140	0.8	6	4
3.6	9	□	MHS0360L040B	33.1	40.7	40.7	90.7	90	0.7	4	4	4.5	24	●	MHS0450L120B	108.8	119.3	120.8	170.8	170	0.8	6	4
3.6	14	□	MHS0360L060B	51.1	60.7	60.7	110.7	110	0.7	4	4	4.6	2	□	MHS0460L020B	10.0	19.8	20.8	70.8	70	0.8	6	3
3.6	22	□	MHS0360L090B	79.9	90.7	90.7	140.7	140	0.7	4	4	4.6	6	□	MHS0460L040B	28.4	39.8	40.8	90.8	90	0.8	6	4
3.6	30	□	MHS0360L120B	108.7	120.7	120.7	170.7	170	0.7	4	4	4.6	10	□	MHS0460L060B	46.8	59.8	60.8	110.8	110	0.8	6	4
3.7	3	□	MHS0370L020B	11.7	20.6	20.6	70.6	70	0.6	4	3	4.6	17	□	MHS0460L090B	79.0	89.8	90.8	140.8	140	0.8	6	4
3.7	8	□	MHS0370L040B	30.3	40.7	40.7	90.7	90	0.7	4	4	4.6	23	□	MHS0460L120B	106.6	119.8	120.8	170.8	170	0.8	6	4
3.7	14	□	MHS0370L060B	52.5	60.7	60.7	110.7	110	0.7	4	4	4.6	30	□	MHS0460L150B	138.8	149.8	150.8	200.8	200	0.8	6	4
3.7	22	□	MHS0370L090B	82.1	90.7	90.7	140.7	140	0.7	4	4	4.7	2	□	MHS0470L020B	10.2	19.8	20.8	70.8	70	0.8	6	3
3.7	30	□	MHS0370L120B	111.7	120.7	120.7	170.7	170	0.7	4	4	4.7	6	□	MHS0470L040B	29.1	39.9	40.9	90.9	90	0.9	6	4
3.8	3	●	MHS0380L020B	12.1	20.7	20.7	70.7	70	0.7	4	3	4.7	10	□	MHS0470L060B	47.9	59.9	60.9	110.9	110	0.9	6	4
3.8	8	●	MHS0380L040B	31.1	40.7	40.7	90.7	90	0.7	4	4	4.7	16	□	MHS0470L090B	76.1	89.9	90.9	140.9	140	0.9	6	4
3.8	13	●	MHS0380L060B	50.1	60.7	60.7	110.7	110	0.7	4	4	4.7	23	□	MHS0470L120B	109.0	119.9	120.9	170.9	170	0.9	6	4
3.8	21	●	MHS0380L090B	80.5	90.7	90.7	140.7	140	0.7	4	4	4.7	29	□	MHS0470L150B	137.2	149.9	150.9	200.9	200	0.9	6	4
3.8	29	●	MHS0380L120B	110.9	120.7	120.7	170.7	170	0.7	4	4	4.8	1	●	MHS0480L020B	5.6	19.8	20.8	70.8	70	0.8	6	3
3.9	3	●	MHS0390L020B	12.4	20.7	20.7	70.7	70	0.7	4	3	4.8	6	●	MHS0480L040B	29.7	39.9	40.9	90.9	90	0.9	6	4
3.9	8	●	MHS0390L040B	31.9	40.7	40.7	90.7	90	0.7	4	4	4.8	10	●	MHS0480L060B	48.9	59.9	60.9	110.9	110	0.9	6	4
3.9	13	●	MHS0390L060B	51.4	60.7	60.7	110.7	110	0.7	4	4	4.8	16	●	MHS0480L090B	77.7	89.9	90.9	140.9	140	0.9	6	4
3.9	21	□	MHS0390L090B	82.6	90.7	90.7	140.7	140	0.7	4	4	4.8	22	●	MHS0480L120B	106.5	119.9	120.9	170.9	170	0.9	6	4
3.9	28	□	MHS0390L120B	109.9	120.7	120.7	170.7	170	0.7	4	4	4.8	29	●	MHS0480L150B	140.1	149.9	150.9	200.9	200	0.9	6	4
4.0	2	●	MHS0400L020B	8.7	20.7	20.7	70.7	70	0.7	4	3	4.9	1	□	MHS0490L020B	5.7	19.8	20.8	70.8	70	0.8	6	3
4.0	7	●	MHS0400L040B	28.7	40.7	40.7	90.7	90	0.7	4	4	4.9	5	□	MHS0490L040B	25.4	39.9	40.9	90.9	90	0.9	6	4
4.0	12	●	MHS0400L060B	48.7	60.7	60.7	110.7	110	0.7	4	4	4.9	10	□	MHS0490L060B	49.9	59.9	60.9	110.9	110	0.9	6	4
4.0	20	●	MHS0400L090B	80.7	90.7	90.7	140.7	140	0.7	4	4	4.9	16	□	MHS0490L090B	79.3	89.9	90.9	140.9	140	0.9	6	4
4.0	27	●	MHS0400L120B	108.7	120.7	120.7	170.7	170	0.7	4	4	4.9	22	□	MHS0490L120B	108.7	119.9	120.9	170.9	170	0.9	6	4
4.1	2	□	MHS0410L020B	8.9	19.2	20.7	70.7	70	0.7	6	3	4.9	28	□	MHS0490L150B	138.1	149.9	150.9	200.9	200	0.9	6	4
4.1	7	□	MHS0410L040B	29.4	39.2	40.7	90.7	90	0.7	6	4	5.0	1	●	MHS0500L020B	5.9	19.9	20.9	70.9	70	0.9	6	3
4.1	12	□	MHS0410L060B	49.9	59.2	60.7	110.7	110	0.7	6	4	5.0	5	●	MHS0500L040B	25.9	39.9	40.9	90.9	90	0.9	6	4
4.1	19	□	MHS0410L090B	78.6	89.2	90.7	140.7	140	0.7	6	4	5.0	9	●	MHS0500L060B	45.9	59.9	60.9	110.9	110	0.9	6	4
4.1	26	□	MHS0410L120B	107.3	119.2	120.7	170.7	170	0.7	6	4	5.0	15	●	MHS0500L090B	75.9	89.9	90.9	140.9	140	0.9	6	4
4.2	2	□	MHS0420L020B	9.1	19.2	20.7	70.7	70	0.7	6	3	5.0	21	●	MHS0500L120B	105.9	119.9	120.9	170.9	170	0.9	6	4
4.2	7	□	MHS0420L040B	30.2	39.3	40.8	90.8	90	0.8	6	4	5.0	27	●	MHS0500L150B	135.9	149.9	150.9	200.9	200	0.9	6	4
4.2	11	□	MHS0420L060B	47.0	59.3	60.8	110.8	110	0.8	6	4	5.1	3	□	MHS0510L030B	16.2	30.4	30.9	80.9	80	0.9	6	3
4.2	19	□	MHS0420L090B	80.6	89.3	90.8	140.8	140	0.8	6	4	5.1	9	□	MHS0510L060B	46.8	60.4	60.9	110.9	110	0.9	6	4
4.2	26	□	MHS0420L120B	110.0	119.3	120.8	170.8	170	0.8	6	4	5.1	15	□	MHS0510L090B	77.4	90.4	90.9	140.9	140	0.9	6	4
4.3	2	□	MHS0430L020B	9.3	19.2	20.7	70.7	70	0.7	6	3	5.1	21	□	MHS0510L120B	108.0	120.4	120.9	170.9	170	0.9	6	4
4.3	6	□	MHS0430L040B	26.6	39.3	40.8	90.8	90	0.8	6	4	5.1	27	□	MHS0510L150B	138.6	150.4	150.9	200.9	200	0.9	6	4
4.3	11	□	MHS0430L060B	48.1	59.3	60.8	110.8	110	0.8	6	4	5.2	3	□	MHS0520L030B	16.5	30.4	30.9	80.9	80	0.9	6	3
4.3	18	□	MHS0430L090B	78.2	89.3	90.8	140.8	140	0.8	6	4	5.2	9	□	MHS0520L060B	47.7	60.4	60.9	110.9	110	0.9	6	4
4.3	25	□	MHS0430L120B	108.3	119.3	120.8	170.8	170	0.8	6	4	5.2	15	□	MHS0520L090B	78.9	90.4	90.9	140.9	140	0.9	6	4
4.4	2	●	MHS0440L020B	9.6	19.3	20.8	70.8	70	0.8	6	3	5.2	20	□	MHS0520L120B	104.9	120.4	120.9	170.9	170	0.9	6	4
4.4	6	□	MHS0440L040B	27.2	39.3	40.8	90.8	90	0.8	6	4	5.2	26	□	MHS0520L150B	136.1	150.4	150.9	200.9	200	0.9	6	4
4.4	11	□	MHS0440L060B	49.2	59.3	60.8	110.8	110	0.8	6	4	5.3	3	□	MHS0530L030B	16.8	30.4	30.9	80.9	80	0.9	6	3

Note 1) 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.





DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
5.3	9	□	MHS0530L060B	48.7	60.5	61.0	111.0	110	1.0	6	4
5.3	14	●	MHS0530L090B	75.2	90.5	91.0	141.0	140	1.0	6	4
5.3	20	□	MHS0530L120B	107.0	120.5	121.0	171.0	170	1.0	6	4
5.3	26	□	MHS0530L150B	138.8	150.5	151.0	201.0	200	1.0	6	4
5.4	3	□	MHS0540L030B	17.1	30.4	30.9	80.9	80	0.9	6	3
5.4	9	□	MHS0540L060B	49.6	60.5	61.0	111.0	110	1.0	6	4
5.4	14	□	MHS0540L090B	76.6	90.5	91.0	141.0	140	1.0	6	4
5.4	20	□	MHS0540L120B	109.0	120.5	121.0	171.0	170	1.0	6	4
5.4	25	□	MHS0540L150B	136.0	150.5	151.0	201.0	200	1.0	6	4
5.5	3	●	MHS0550L030B	17.4	30.4	30.9	80.9	80	0.9	6	3
5.5	8	●	MHS0550L060B	45.0	60.5	61.0	111.0	110	1.0	6	4
5.5	14	●	MHS0550L090B	78.0	90.5	91.0	141.0	140	1.0	6	4
5.5	19	●	MHS0550L120B	105.5	120.5	121.0	171.0	170	1.0	6	4
5.5	25	●	MHS0550L150B	138.5	150.5	151.0	201.0	200	1.0	6	4
5.6	3	□	MHS0560L030B	17.8	31.0	31.0	81.0	80	1.0	6	3
5.6	8	□	MHS0560L060B	45.8	61.0	61.0	111.0	110	1.0	6	4
5.6	14	□	MHS0560L090B	79.4	91.0	91.0	141.0	140	1.0	6	4
5.6	19	□	MHS0560L120B	107.4	121.0	121.0	171.0	170	1.0	6	4
5.6	24	□	MHS0560L150B	135.4	151.0	151.0	201.0	200	1.0	6	4
5.7	3	□	MHS0570L030B	18.1	31.0	31.0	81.0	80	1.0	6	3
5.7	8	□	MHS0570L060B	46.6	61.0	61.0	111.0	110	1.0	6	4
5.7	13	□	MHS0570L090B	75.1	91.0	91.0	141.0	140	1.0	6	4
5.7	19	□	MHS0570L120B	109.3	121.0	121.0	171.0	170	1.0	6	4
5.7	24	□	MHS0570L150B	137.8	151.0	151.0	201.0	200	1.0	6	4
5.8	3	●	MHS0580L030B	18.4	31.0	31.0	81.0	80	1.0	6	3
5.8	8	●	MHS0580L060B	47.5	61.1	61.1	111.1	110	1.1	6	4
5.8	13	●	MHS0580L090B	76.5	91.1	91.1	141.1	140	1.1	6	4
5.8	18	●	MHS0580L120B	105.5	121.1	121.1	171.1	170	1.1	6	4
5.8	23	●	MHS0580L150B	134.5	151.1	151.1	201.1	200	1.1	6	4
5.9	3	□	MHS0590L030B	18.7	31.0	31.0	81.0	80	1.0	6	3
5.9	8	□	MHS0590L060B	48.3	61.1	61.1	111.1	110	1.1	6	4
5.9	13	□	MHS0590L090B	77.8	91.1	91.1	141.1	140	1.1	6	4
5.9	18	□	MHS0590L120B	107.3	121.1	121.1	171.1	170	1.1	6	4
5.9	23	□	MHS0590L150B	136.8	151.1	151.1	201.1	200	1.1	6	4
6.0	2	●	MHS0600L030B	13.0	31.0	31.0	81.0	80	1.0	6	3
6.0	7	●	MHS0600L060B	43.1	61.1	61.1	111.1	110	1.1	6	4
6.0	12	●	MHS0600L090B	73.1	91.1	91.1	141.1	140	1.1	6	4
6.0	17	●	MHS0600L120B	103.1	121.1	121.1	171.1	170	1.1	6	4
6.0	22	●	MHS0600L150B	133.1	151.1	151.1	201.1	200	1.1	6	4
6.1	2	□	MHS0610L030B	13.3	29.6	31.1	81.1	80	1.1	8	3
6.1	7	□	MHS0610L060B	43.8	59.6	61.1	111.1	110	1.1	8	4
6.1	12	□	MHS0610L090B	74.3	89.6	91.1	141.1	140	1.1	8	4
6.1	17	□	MHS0610L120B	104.8	119.6	121.1	171.1	170	1.1	8	4
6.1	22	□	MHS0610L150B	135.3	149.6	151.1	201.1	200	1.1	8	4
6.2	2	□	MHS0620L030B	13.5	29.6	31.1	81.1	80	1.1	8	3
6.2	7	□	MHS0620L060B	44.5	59.6	61.1	111.1	110	1.1	8	4
6.2	12	□	MHS0620L090B	75.5	89.6	91.1	141.1	140	1.1	8	4
6.2	17	□	MHS0620L120B	106.5	119.6	121.1	171.1	170	1.1	8	4

(mm)

DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
6.2	21	□	MHS0620L150B	131.3	149.6	151.1	201.1	200	1.1	8	4
6.3	2	□	MHS0630L030B	13.7	29.6	31.1	81.1	80	1.1	8	3
6.3	7	□	MHS0630L060B	45.2	59.6	61.1	111.1	110	1.1	8	4
6.3	12	□	MHS0630L090B	76.7	89.6	91.1	141.1	140	1.1	8	4
6.3	16	□	MHS0630L120B	101.9	119.6	121.1	171.1	170	1.1	8	4
6.3	21	□	MHS0630L150B	133.4	149.6	151.1	201.1	200	1.1	8	4
6.4	2	□	MHS0640L030B	13.9	29.6	31.1	81.1	80	1.1	8	3
6.4	7	□	MHS0640L060B	46.0	59.7	61.2	111.2	110	1.2	8	4
6.4	11	□	MHS0640L090B	71.6	89.7	91.2	141.2	140	1.2	8	4
6.4	16	□	MHS0640L120B	103.6	119.7	121.2	171.2	170	1.2	8	4
6.4	21	□	MHS0640L150B	135.6	149.7	151.2	201.2	200	1.2	8	4
6.5	2	●	MHS0650L030B	14.1	29.6	31.1	81.1	80	1.1	8	3
6.5	6	●	MHS0650L060B	40.2	59.7	61.2	111.2	110	1.2	8	4
6.5	11	●	MHS0650L090B	72.7	89.7	91.2	141.2	140	1.2	8	4
6.5	16	●	MHS0650L120B	105.2	119.7	121.2	171.2	170	1.2	8	4
6.5	20	●	MHS0650L150B	131.2	149.7	151.2	201.2	200	1.2	8	4
6.6	2	□	MHS0660L030B	14.3	30.1	31.1	81.1	80	1.1	8	3
6.6	6	□	MHS0660L060B	40.8	60.2	61.2	111.2	110	1.2	8	4
6.6	11	□	MHS0660L090B	73.8	90.2	91.2	141.2	140	1.2	8	4
6.6	16	□	MHS0660L120B	106.8	120.2	121.2	171.2	170	1.2	8	4
6.6	20	□	MHS0660L150B	133.2	150.2	151.2	201.2	200	1.2	8	4
6.6	28	□	MHS0660L200B	186.0	200.2	201.2	251.2	250	1.2	8	4
6.7	2	□	MHS0670L030B	14.6	30.2	31.2	81.2	80	1.2	8	3
6.7	6	□	MHS0670L060B	41.4	60.2	61.2	111.2	110	1.2	8	4
6.7	11	□	MHS0670L090B	74.9	90.2	91.2	141.2	140	1.2	8	4
6.7	15	□	MHS0670L120B	101.7	120.2	121.2	171.2	170	1.2	8	4
6.7	20	□	MHS0670L150B	135.2	150.2	151.2	201.2	200	1.2	8	4
6.7	27	□	MHS0670L200B	182.1	200.2	201.2	251.2	250	1.2	8	4
6.8	2	●	MHS0680L030B	14.8	30.2	31.2	81.2	80	1.2	8	3
6.8	6	●	MHS0680L060B	42.0	60.2	61.2	111.2	110	1.2	8	4
6.8	11	●	MHS0680L090B	76.0	90.2	91.2	141.2	140	1.2	8	4
6.8	15	●	MHS0680L120B	103.2	120.2	121.2	171.2	170	1.2	8	4
6.8	19	●	MHS0680L150B	130.4	150.2	151.2	201.2	200	1.2	8	4
6.8	27	●	MHS0680L200B	184.8	200.2	201.2	251.2	250	1.2	8	4
6.9	2	□	MHS0690L030B	15.0	30.2	31.2	81.2	80	1.2	8	3
6.9	6	□	MHS0690L060B	42.7	60.3	61.3	111.3	110	1.3	8	4
6.9	10	□	MHS0690L090B	70.3	90.3	91.3	141.3	140	1.3	8	4
6.9	15	□	MHS0690L120B	104.8	120.3	121.3	171.3	170	1.3	8	4
6.9	19	□	MHS0690L150B	132.4	150.3	151.3	201.3	200	1.3	8	4
6.9	26	□	MHS0690L200B	180.7	200.3	201.3	251.3	250	1.3	8	4
7.0	2	●	MHS0700L030B	15.2	30.2	31.2	81.2	80	1.2	8	3
7.0	6	●	MHS0700L060B	43.3	60.3	61.3	111.3	110	1.3	8	4
7.0	10	●	MHS0700L090B	71.3	90.3	91.3	141.3	140	1.3	8	4
7.0	14	●	MHS0700L120B	99.3	120.3	121.3	171.3	170	1.3	8	4
7.0	19	●	MHS0700L150B	134.3	150.3	151.3	201.3	200	1.3	8	4
7.0	26	●	MHS0700L200B	183.3	200.3	201.3	251.3	250	1.3	8	4
7.1	2	□	MHS0710L030B	15.4	30.7	31.2	81.2	80	1.2	8	3
7.1	6	□	MHS0710L060B	43.9	60.8	61.3	111.3	110	1.3	8	4

● = Add Inventory Item

DC = Cutting Diameter  
 LU = Usable Length  
 LCF = Length Chip Flute

LH = Neck Length  
 OAL = Overall Length  
 LF = Functional Length

PL = Point Length  
 DCON = Connection Diameter

# MHS

## WSTAR DRILLS

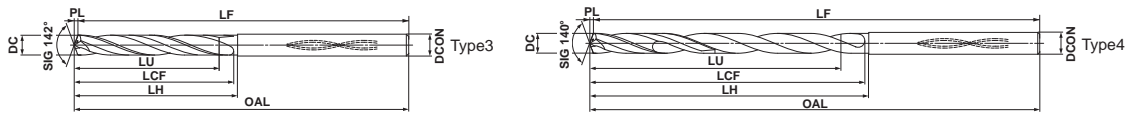
(mm)

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
7.1	10	□	MHS0710L090B	72.3	90.8	91.3	141.3	140	1.3	8	4
7.1	14	□	MHS0710L120B	100.7	120.8	121.3	171.3	170	1.3	8	4
7.1	19	□	MHS0710L150B	136.2	150.8	151.3	201.3	200	1.3	8	4
7.1	26	□	MHS0710L200B	185.9	200.8	201.3	251.3	250	1.3	8	4
7.2	2	□	MHS0720L030B	15.6	30.7	31.2	81.2	80	1.2	8	3
7.2	6	□	MHS0720L060B	44.5	60.8	61.3	111.3	110	1.3	8	4
7.2	10	□	MHS0720L090B	73.3	90.8	91.3	141.3	140	1.3	8	4
7.2	14	□	MHS0720L120B	102.1	120.8	121.3	171.3	170	1.3	8	4
7.2	18	□	MHS0720L150B	130.9	150.8	151.3	201.3	200	1.3	8	4
7.2	25	□	MHS0720L200B	181.3	200.8	201.3	251.3	250	1.3	8	4
7.3	2	□	MHS0730L030B	15.9	30.8	31.3	81.3	80	1.3	8	3
7.3	6	□	MHS0730L060B	45.1	60.8	61.3	111.3	110	1.3	8	4
7.3	10	□	MHS0730L090B	74.3	90.8	91.3	141.3	140	1.3	8	4
7.3	14	□	MHS0730L120B	103.5	120.8	121.3	171.3	170	1.3	8	4
7.3	18	□	MHS0730L150B	132.7	150.8	151.3	201.3	200	1.3	8	4
7.3	25	□	MHS0730L200B	183.8	200.8	201.3	251.3	250	1.3	8	4
7.4	1	□	MHS0740L030B	8.7	30.8	31.3	81.3	80	1.3	8	3
7.4	6	□	MHS0740L060B	45.7	60.8	61.3	111.3	110	1.3	8	4
7.4	10	□	MHS0740L090B	75.3	90.8	91.3	141.3	140	1.3	8	4
7.4	14	□	MHS0740L120B	104.9	120.8	121.3	171.3	170	1.3	8	4
7.4	18	□	MHS0740L150B	134.5	150.8	151.3	201.3	200	1.3	8	4
7.4	24	□	MHS0740L200B	178.9	200.8	201.3	251.3	250	1.3	8	4
7.5	1	●	MHS0750L030B	8.8	30.8	31.3	81.3	80	1.3	8	3
7.5	5	●	MHS0750L060B	38.9	60.9	61.4	111.4	110	1.4	8	4
7.5	9	●	MHS0750L090B	68.9	90.9	91.4	141.4	140	1.4	8	4
7.5	13	●	MHS0750L120B	98.9	120.9	121.4	171.4	170	1.4	8	4
7.5	17	●	MHS0750L150B	128.9	150.9	151.4	201.4	200	1.4	8	4
7.5	24	●	MHS0750L200B	181.4	200.9	201.4	251.4	250	1.4	8	4
7.6	1	□	MHS0760L030B	8.9	31.3	31.3	81.3	80	1.3	8	3
7.6	5	□	MHS0760L060B	39.4	61.4	61.4	111.4	110	1.4	8	4
7.6	9	□	MHS0760L090B	69.8	91.4	91.4	141.4	140	1.4	8	4
7.6	13	□	MHS0760L120B	100.2	121.4	121.4	171.4	170	1.4	8	4
7.6	17	□	MHS0760L150B	130.6	151.4	151.4	201.4	200	1.4	8	4
7.6	24	□	MHS0760L200B	183.8	201.4	201.4	251.4	250	1.4	8	4
7.6	30	□	MHS0760L250B	229.4	251.4	251.4	301.4	300	1.4	8	4
7.7	1	□	MHS0770L030B	9.0	31.3	31.3	81.3	80	1.3	8	3
7.7	5	□	MHS0770L060B	39.9	61.4	61.4	111.4	110	1.4	8	4
7.7	9	□	MHS0770L090B	70.7	91.4	91.4	141.4	140	1.4	8	4
7.7	13	□	MHS0770L120B	101.5	121.4	121.4	171.4	170	1.4	8	4
7.7	17	□	MHS0770L150B	132.3	151.4	151.4	201.4	200	1.4	8	4
7.7	23	□	MHS0770L200B	178.5	201.4	201.4	251.4	250	1.4	8	4
7.7	30	□	MHS0770L250B	232.4	251.4	251.4	301.4	300	1.4	8	4
7.8	1	●	MHS0780L030B	9.1	31.3	31.3	81.3	80	1.3	8	3
7.8	5	●	MHS0780L060B	40.4	61.4	61.4	111.4	110	1.4	8	4
7.8	9	●	MHS0780L090B	71.6	91.4	91.4	141.4	140	1.4	8	4
7.8	13	●	MHS0780L120B	102.8	121.4	121.4	171.4	170	1.4	8	4
7.8	17	●	MHS0780L150B	134.0	151.4	151.4	201.4	200	1.4	8	4
7.8	23	●	MHS0780L200B	180.8	201.4	201.4	251.4	250	1.4	8	4

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
7.8	30	●	MHS0780L250B	235.4	251.4	251.4	301.4	300	1.4	8	4
7.9	1	□	MHS0790L030B	9.3	31.4	31.4	81.4	80	1.4	8	3
7.9	5	□	MHS0790L060B	40.9	61.4	61.4	111.4	110	1.4	8	4
7.9	9	□	MHS0790L090B	72.5	91.4	91.4	141.4	140	1.4	8	4
7.9	13	□	MHS0790L120B	104.1	121.4	121.4	171.4	170	1.4	8	4
7.9	16	□	MHS0790L150B	127.8	151.4	151.4	201.4	200	1.4	8	4
7.9	23	□	MHS0790L200B	183.1	201.4	201.4	251.4	250	1.4	8	4
7.9	29	□	MHS0790L250B	230.5	251.4	251.4	301.4	300	1.4	8	4
8.0	1	●	MHS0800L030B	9.4	31.4	31.4	81.4	80	1.4	8	3
8.0	5	●	MHS0800L060B	41.5	61.5	61.5	111.5	110	1.5	8	4
8.0	9	●	MHS0800L090B	73.5	91.5	91.5	141.5	140	1.5	8	4
8.0	12	●	MHS0800L120B	97.5	121.5	121.5	171.5	170	1.5	8	4
8.0	16	●	MHS0800L150B	129.5	151.5	151.5	201.5	200	1.5	8	4
8.0	22	●	MHS0800L200B	177.5	201.5	201.5	251.5	250	1.5	8	4
8.0	29	●	MHS0800L250B	233.5	251.5	251.5	301.5	300	1.5	8	4
8.1	2	□	MHS0810L040B	17.6	39.9	41.4	101.4	100	1.4	10	3
8.1	8	□	MHS0810L090B	66.3	90.0	91.5	151.5	150	1.5	10	4
8.1	12	□	MHS0810L120B	98.7	120.0	121.5	181.5	180	1.5	10	4
8.1	16	□	MHS0810L150B	131.1	150.0	151.5	211.5	210	1.5	10	4
8.1	22	□	MHS0810L200B	179.7	200.0	201.5	261.5	260	1.5	10	4
8.1	28	□	MHS0810L250B	228.3	250.0	251.5	311.5	310	1.5	10	4
8.2	2	□	MHS0820L040B	17.8	39.9	41.4	101.4	100	1.4	10	3
8.2	8	□	MHS0820L090B	67.1	90.0	91.5	151.5	150	1.5	10	4
8.2	12	□	MHS0820L120B	99.9	120.0	121.5	181.5	180	1.5	10	4
8.2	16	□	MHS0820L150B	132.7	150.0	151.5	211.5	210	1.5	10	4
8.2	22	□	MHS0820L200B	181.9	200.0	201.5	261.5	260	1.5	10	4
8.2	28	□	MHS0820L250B	231.1	250.0	251.5	311.5	310	1.5	10	4
8.3	2	□	MHS0830L040B	18.0	39.9	41.4	101.4	100	1.4	10	3
8.3	8	□	MHS0830L090B	67.9	90.0	91.5	151.5	150	1.5	10	4
8.3	12	□	MHS0830L120B	101.1	120.0	121.5	181.5	180	1.5	10	4
8.3	15	□	MHS0830L150B	126.0	150.0	151.5	211.5	210	1.5	10	4
8.3	21	□	MHS0830L200B	175.8	200.0	201.5	261.5	260	1.5	10	4
8.3	27	□	MHS0830L250B	225.6	250.0	251.5	311.5	310	1.5	10	4
8.4	2	□	MHS0840L040B	18.2	39.9	41.4	101.4	100	1.4	10	3
8.4	8	□	MHS0840L090B	68.7	90.0	91.5	151.5	150	1.5	10	4
8.4	12	□	MHS0840L120B	102.3	120.0	121.5	181.5	180	1.5	10	4
8.4	15	□	MHS0840L150B	127.5	150.0	151.5	211.5	210	1.5	10	4
8.4	21	□	MHS0840L200B	177.9	200.0	201.5	261.5	260	1.5	10	4
8.4	27	□	MHS0840L250B	228.3	250.0	251.5	311.5	310	1.5	10	4
8.5	2	●	MHS0850L040B	18.5	40.0	41.5	101.5	100	1.5	10	3
8.5	8	●	MHS0850L090B	69.5	90.0	91.5	151.5	150	1.5	10	4
8.5	11	●	MHS0850L120B	95.0	120.0	121.5	181.5	180	1.5	10	4
8.5	15	●	MHS0850L150B	129.0	150.0	151.5	211.5	210	1.5	10	4
8.5	21	●	MHS0850L200B	180.0	200.0	201.5	261.5	260	1.5	10	4
8.5	27	●	MHS0850L250B	231.0	250.0	251.5	311.5	310	1.5	10	4
8.6	2	□	MHS0860L040B	18.7	40.5	41.5	101.5	100	1.5	10	3
8.6	8	□	MHS0860L090B	70.4	90.6	91.6	151.6	150	1.6	10	4
8.6	11	□	MHS0860L120B	96.2	120.6	121.6	181.6	180	1.6	10	4

Note 1) 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.



DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
8.6	15	□	MHS0860L150B	130.6	150.6	151.6	211.6	210	1.6	10	4
8.6	21	□	MHS0860L200B	182.2	200.6	201.6	261.6	260	1.6	10	4
8.6	26	□	MHS0860L250B	225.2	250.6	251.6	311.6	310	1.6	10	4
8.7	2	□	MHS0870L040B	18.9	40.5	41.5	101.5	100	1.5	10	3
8.7	8	□	MHS0870L090B	71.2	90.6	91.6	151.6	150	1.6	10	4
8.7	11	□	MHS0870L120B	97.3	120.6	121.6	181.6	180	1.6	10	4
8.7	15	□	MHS0870L150B	132.1	150.6	151.6	211.6	210	1.6	10	4
8.7	20	□	MHS0870L200B	175.6	200.6	201.6	261.6	260	1.6	10	4
8.7	26	□	MHS0870L250B	227.8	250.6	251.6	311.6	310	1.6	10	4
8.8	2	●	MHS0880L040B	19.1	40.5	41.5	101.5	100	1.5	10	3
8.8	8	●	MHS0880L090B	72.0	90.6	91.6	151.6	150	1.6	10	4
8.8	11	●	MHS0880L120B	98.4	120.6	121.6	181.6	180	1.6	10	4
8.8	14	●	MHS0880L150B	124.8	150.6	151.6	211.6	210	1.6	10	4
8.8	20	●	MHS0880L200B	177.6	200.6	201.6	261.6	260	1.6	10	4
8.8	26	●	MHS0880L250B	230.4	250.6	251.6	311.6	310	1.6	10	4
8.9	2	□	MHS0890L040B	19.3	40.5	41.5	101.5	100	1.5	10	3
8.9	7	□	MHS0890L090B	63.9	90.6	91.6	151.6	150	1.6	10	4
8.9	11	□	MHS0890L120B	99.5	120.6	121.6	181.6	180	1.6	10	4
8.9	14	□	MHS0890L150B	126.2	150.6	151.6	211.6	210	1.6	10	4
8.9	20	□	MHS0890L200B	179.6	200.6	201.6	261.6	260	1.6	10	4
8.9	25	□	MHS0890L250B	224.1	250.6	251.6	311.6	310	1.6	10	4
9.0	2	●	MHS0900L040B	19.5	40.5	41.5	101.5	100	1.5	10	3
9.0	7	●	MHS0900L090B	64.6	90.6	91.6	151.6	150	1.6	10	4
9.0	11	●	MHS0900L120B	100.6	120.6	121.6	181.6	180	1.6	10	4
9.0	14	●	MHS0900L150B	127.6	150.6	151.6	211.6	210	1.6	10	4
9.0	20	●	MHS0900L200B	181.6	200.6	201.6	261.6	260	1.6	10	4
9.0	25	●	MHS0900L250B	226.6	250.6	251.6	311.6	310	1.6	10	4
9.1	2	□	MHS0910L040B	19.8	41.1	41.6	101.6	100	1.6	10	3
9.1	7	□	MHS0910L090B	65.4	91.2	91.7	151.7	150	1.7	10	4
9.1	11	□	MHS0910L120B	101.8	121.2	121.7	181.7	180	1.7	10	4
9.1	14	□	MHS0910L150B	129.1	151.2	151.7	211.7	210	1.7	10	4
9.1	19	□	MHS0910L200B	174.6	201.2	201.7	261.7	260	1.7	10	4
9.1	25	□	MHS0910L250B	229.2	251.2	251.7	311.7	310	1.7	10	4
9.1	30	□	MHS0910L300B	274.7	301.2	301.7	361.7	360	1.7	10	4
9.2	2	□	MHS0920L040B	20.0	41.1	41.6	101.6	100	1.6	10	3
9.2	7	□	MHS0920L090B	66.1	91.2	91.7	151.7	150	1.7	10	4
9.2	10	□	MHS0920L120B	93.7	121.2	121.7	181.7	180	1.7	10	4
9.2	14	□	MHS0920L150B	130.5	151.2	151.7	211.7	210	1.7	10	4
9.2	19	□	MHS0920L200B	176.5	201.2	201.7	261.7	260	1.7	10	4
9.2	25	□	MHS0920L250B	231.7	251.2	251.7	311.7	310	1.7	10	4
9.2	30	□	MHS0920L300B	277.7	301.2	301.7	361.7	360	1.7	10	4
9.3	2	□	MHS0930L040B	20.2	41.1	41.6	101.6	100	1.6	10	3
9.3	7	□	MHS0930L090B	66.8	91.2	91.7	151.7	150	1.7	10	4
9.3	10	□	MHS0930L120B	94.7	121.2	121.7	181.7	180	1.7	10	4
9.3	14	□	MHS0930L150B	131.9	151.2	151.7	211.7	210	1.7	10	4
9.3	19	□	MHS0930L200B	178.4	201.2	201.7	261.7	260	1.7	10	4
9.3	24	□	MHS0930L250B	224.9	251.2	251.7	311.7	310	1.7	10	4
9.3	30	□	MHS0930L300B	280.7	301.2	301.7	361.7	360	1.7	10	4

DC	Hole Depth (L/D)	VP15TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
9.4	2	□	MHS0940L040B	20.4	41.1	41.6	101.6	100	1.6	10	3
9.4	7	□	MHS0940L090B	67.5	91.2	91.7	151.7	150	1.7	10	4
9.4	10	□	MHS0940L120B	95.7	121.2	121.7	181.7	180	1.7	10	4
9.4	13	□	MHS0940L150B	123.9	151.2	151.7	211.7	210	1.7	10	4
9.4	19	□	MHS0940L200B	180.3	201.2	201.7	261.7	260	1.7	10	4
9.4	24	□	MHS0940L250B	227.3	251.2	251.7	311.7	310	1.7	10	4
9.4	29	□	MHS0940L300B	274.3	301.2	301.7	361.7	360	1.7	10	4
9.5	2	●	MHS0950L040B	20.6	41.1	41.6	101.6	100	1.6	10	3
9.5	7	●	MHS0950L090B	68.2	91.2	91.7	151.7	150	1.7	10	4
9.5	10	●	MHS0950L120B	96.7	121.2	121.7	181.7	180	1.7	10	4
9.5	13	●	MHS0950L150B	125.2	151.2	151.7	211.7	210	1.7	10	4
9.5	18	●	MHS0950L200B	172.7	201.2	201.7	261.7	260	1.7	10	4
9.5	24	●	MHS0950L250B	229.7	251.2	251.7	311.7	310	1.7	10	4
9.5	29	●	MHS0950L300B	277.2	301.2	301.7	361.7	360	1.7	10	4
9.6	2	□	MHS0960L040B	20.9	41.7	41.7	101.7	100	1.7	10	3
9.6	7	□	MHS0960L090B	68.9	91.7	91.7	151.7	150	1.7	10	4
9.6	10	□	MHS0960L120B	97.7	121.7	121.7	181.7	180	1.7	10	4
9.6	13	□	MHS0960L150B	126.5	151.7	151.7	211.7	210	1.7	10	4
9.6	18	□	MHS0960L200B	174.5	201.7	201.7	261.7	260	1.7	10	4
9.6	24	□	MHS0960L250B	232.1	251.7	251.7	311.7	310	1.7	10	4
9.6	29	□	MHS0960L300B	280.1	301.7	301.7	361.7	360	1.7	10	4
9.7	2	□	MHS0970L040B	21.1	41.7	41.7	101.7	100	1.7	10	3
9.7	7	□	MHS0970L090B	69.7	91.8	91.8	151.8	150	1.8	10	4
9.7	10	□	MHS0970L120B	98.8	121.8	121.8	181.8	180	1.8	10	4
9.7	13	□	MHS0970L150B	127.9	151.8	151.8	211.8	210	1.8	10	4
9.7	18	□	MHS0970L200B	176.4	201.8	201.8	261.8	260	1.8	10	4
9.7	23	□	MHS0970L250B	224.9	251.8	251.8	311.8	310	1.8	10	4
9.7	28	□	MHS0970L300B	273.4	301.8	301.8	361.8	360	1.8	10	4
9.8	2	●	MHS0980L040B	21.3	41.7	41.7	101.7	100	1.7	10	3
9.8	7	●	MHS0980L090B	70.4	91.8	91.8	151.8	150	1.8	10	4
9.8	10	●	MHS0980L120B	99.8	121.8	121.8	181.8	180	1.8	10	4
9.8	13	●	MHS0980L150B	129.2	151.8	151.8	211.8	210	1.8	10	4
9.8	18	●	MHS0980L200B	178.2	201.8	201.8	261.8	260	1.8	10	4
9.8	23	●	MHS0980L250B	227.2	251.8	251.8	311.8	310	1.8	10	4
9.8	28	●	MHS0980L300B	276.2	301.8	301.8	361.8	360	1.8	10	4
9.9	2	□	MHS0990L040B	21.5	41.7	41.7	101.7	100	1.7	10	3
9.9	7	□	MHS0990L090B	71.1	91.8	91.8	151.8	150	1.8	10	4
9.9	10	□	MHS0990L120B	100.8	121.8	121.8	181.8	180	1.8	10	4
9.9	13	□	MHS0990L150B	130.5	151.8	151.8	211.8	210	1.8	10	4
9.9	18	□	MHS0990L200B	180.0	201.8	201.8	261.8	260	1.8	10	4
9.9	23	□	MHS0990L250B	229.5	251.8	251.8	311.8	310	1.8	10	4
9.9	28	□	MHS0990L300B	279.0	301.8	301.8	361.8	360	1.8	10	4
10.0	1	●	MHS1000L040B	11.7	41.7	41.7	101.7	100	1.7	10	3
10.0	6	●	MHS1000L090B	61.8	91.8	91.8	151.8	150	1.8	10	4
10.0	9	●	MHS1000L120B	91.8	121.8	121.8	181.8	180	1.8	10	4
10.0	12	●	MHS1000L150B	121.8	151.8	151.8	211.8	210	1.8	10	4
10.0	17	●	MHS1000L200B	171.8	201.8	201.8	261.8	260	1.8	10	4
10.0	22	●	MHS1000L250B	221.8	251.8	251.8	311.8	310	1.8	10	4

DC = Cutting Diameter  
 LU = Usable Length  
 LCF = Length Chip Flute

LH = Neck Length  
 OAL = Overall Length  
 LF = Functional Length

PL = Point Length  
 DCON = Connection Diameter



# MHS

## WSTAR DRILLS

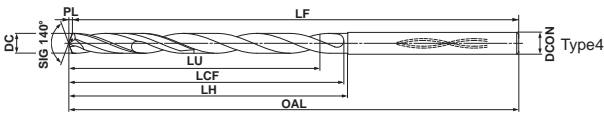
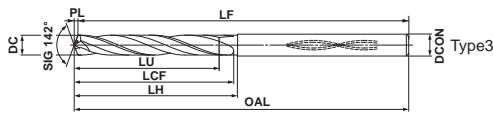
(mm)

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
10.0	27	●	MHS1000L300B	271.8	301.8	301.8	361.8	360	1.8	10	4
10.1	1	□	MHS1010L040B	11.8	40.2	41.7	101.7	100	1.7	12	3
10.1	6	□	MHS1010L090B	62.4	90.3	91.8	151.8	150	1.8	12	4
10.1	9	□	MHS1010L120B	92.7	120.3	121.8	181.8	180	1.8	12	4
10.1	12	□	MHS1010L150B	123.0	150.3	151.8	211.8	210	1.8	12	4
10.1	17	□	MHS1010L200B	173.5	200.3	201.8	261.8	260	1.8	12	4
10.1	22	□	MHS1010L250B	224.0	250.3	251.8	311.8	310	1.8	12	4
10.1	27	□	MHS1010L300B	274.5	300.3	301.8	361.8	360	1.8	12	4
10.2	1	□	MHS1020L040B	12.0	40.3	41.8	101.8	100	1.8	12	3
10.2	6	□	MHS1020L090B	63.1	90.4	91.9	151.9	150	1.9	12	4
10.2	9	□	MHS1020L120B	93.7	120.4	121.9	181.9	180	1.9	12	4
10.2	12	□	MHS1020L150B	124.3	150.4	151.9	211.9	210	1.9	12	4
10.2	17	□	MHS1020L200B	175.3	200.4	201.9	261.9	260	1.9	12	4
10.2	22	□	MHS1020L250B	226.3	250.4	251.9	311.9	310	1.9	12	4
10.2	27	□	MHS1020L300B	277.3	300.4	301.9	361.9	360	1.9	12	4
10.3	1	□	MHS1030L040B	12.1	40.3	41.8	101.8	100	1.8	12	3
10.3	6	□	MHS1030L090B	63.7	90.4	91.9	151.9	150	1.9	12	4
10.3	9	□	MHS1030L120B	94.6	120.4	121.9	181.9	180	1.9	12	4
10.3	12	□	MHS1030L150B	125.5	150.4	151.9	211.9	210	1.9	12	4
10.3	17	□	MHS1030L200B	177.0	200.4	201.9	261.9	260	1.9	12	4
10.3	22	□	MHS1030L250B	228.5	250.4	251.9	311.9	310	1.9	12	4
10.3	26	□	MHS1030L300B	269.7	300.4	301.9	361.9	360	1.9	12	4
10.4	1	□	MHS1040L040B	12.2	40.3	41.8	101.8	100	1.8	12	3
10.4	6	□	MHS1040L090B	64.3	90.4	91.9	151.9	150	1.9	12	4
10.4	9	□	MHS1040L120B	95.5	120.4	121.9	181.9	180	1.9	12	4
10.4	12	□	MHS1040L150B	126.7	150.4	151.9	211.9	210	1.9	12	4
10.4	17	□	MHS1040L200B	178.7	200.4	201.9	261.9	260	1.9	12	4
10.4	21	□	MHS1040L250B	220.3	250.4	251.9	311.9	310	1.9	12	4
10.4	26	□	MHS1040L300B	272.3	300.4	301.9	361.9	360	1.9	12	4
10.5	1	●	MHS1050L040B	12.3	40.3	41.8	101.8	100	1.8	12	3
10.5	6	●	MHS1050L090B	64.9	90.4	91.9	151.9	150	1.9	12	4
10.5	9	●	MHS1050L120B	96.4	120.4	121.9	181.9	180	1.9	12	4
10.5	12	●	MHS1050L150B	127.9	150.4	151.9	211.9	210	1.9	12	4
10.5	16	●	MHS1050L200B	169.9	200.4	201.9	261.9	260	1.9	12	4
10.5	21	●	MHS1050L250B	222.4	250.4	251.9	311.9	310	1.9	12	4
10.5	26	●	MHS1050L300B	274.9	300.4	301.9	361.9	360	1.9	12	4
10.6	1	□	MHS1060L040B	12.4	40.8	41.8	101.8	100	1.8	12	3
10.6	6	□	MHS1060L090B	65.5	90.9	91.9	151.9	150	1.9	12	4
10.6	9	□	MHS1060L120B	97.3	120.9	121.9	181.9	180	1.9	12	4
10.6	12	□	MHS1060L150B	129.1	150.9	151.9	211.9	210	1.9	12	4
10.6	16	□	MHS1060L200B	171.5	200.9	201.9	261.9	260	1.9	12	4
10.6	21	□	MHS1060L250B	224.5	250.9	251.9	311.9	310	1.9	12	4
10.6	26	□	MHS1060L300B	277.5	300.9	301.9	361.9	360	1.9	12	4
10.7	1	□	MHS1070L040B	12.5	40.8	41.8	101.8	100	1.8	12	3
10.7	6	□	MHS1070L090B	66.1	90.9	91.9	151.9	150	1.9	12	4
10.7	9	□	MHS1070L120B	98.2	120.9	121.9	181.9	180	1.9	12	4
10.7	11	□	MHS1070L150B	119.6	150.9	151.9	211.9	210	1.9	12	4
10.7	16	□	MHS1070L200B	173.1	200.9	201.9	261.9	260	1.9	12	4

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
10.7	21	□	MHS1070L250B	226.6	250.9	251.9	311.9	310	1.9	12	4
10.7	25	□	MHS1070L300B	269.4	300.9	301.9	361.9	360	1.9	12	4
10.8	1	●	MHS1080L040B	12.7	40.9	41.9	101.9	100	1.9	12	3
10.8	6	●	MHS1080L090B	66.8	91.0	92.0	152.0	150	2.0	12	4
10.8	9	●	MHS1080L120B	99.2	121.0	122.0	182.0	180	2.0	12	4
10.8	11	●	MHS1080L150B	120.8	151.0	152.0	212.0	210	2.0	12	4
10.8	16	●	MHS1080L200B	174.8	201.0	202.0	262.0	260	2.0	12	4
10.8	21	●	MHS1080L250B	228.8	251.0	252.0	312.0	310	2.0	12	4
10.8	25	●	MHS1080L300B	272.0	301.0	302.0	362.0	360	2.0	12	4
10.9	1	□	MHS1090L040B	12.8	40.9	41.9	101.9	100	1.9	12	3
10.9	6	□	MHS1090L090B	67.4	91.0	92.0	152.0	150	2.0	12	4
10.9	8	□	MHS1090L120B	89.2	121.0	122.0	182.0	180	2.0	12	4
10.9	11	□	MHS1090L150B	121.9	151.0	152.0	212.0	210	2.0	12	4
10.9	16	□	MHS1090L200B	176.4	201.0	202.0	262.0	260	2.0	12	4
10.9	20	□	MHS1090L250B	220.0	251.0	252.0	312.0	310	2.0	12	4
10.9	25	□	MHS1090L300B	274.5	301.0	302.0	362.0	360	2.0	12	4
11.0	1	●	MHS1100L040B	12.9	40.9	41.9	101.9	100	1.9	12	3
11.0	6	●	MHS1100L090B	68.0	91.0	92.0	152.0	150	2.0	12	4
11.0	8	●	MHS1100L120B	90.0	121.0	122.0	182.0	180	2.0	12	4
11.0	11	●	MHS1100L150B	123.0	151.0	152.0	212.0	210	2.0	12	4
11.0	16	●	MHS1100L200B	178.0	201.0	202.0	262.0	260	2.0	12	4
11.0	20	●	MHS1100L250B	222.0	251.0	252.0	312.0	310	2.0	12	4
11.0	25	●	MHS1100L300B	277.0	301.0	302.0	362.0	360	2.0	12	4
11.1	1	□	MHS1110L040B	13.0	41.4	41.9	101.9	100	1.9	12	3
11.1	6	□	MHS1110L090B	68.6	91.5	92.0	152.0	150	2.0	12	4
11.1	8	□	MHS1110L120B	90.8	121.5	122.0	182.0	180	2.0	12	4
11.1	11	□	MHS1110L150B	124.1	151.5	152.0	212.0	210	2.0	12	4
11.1	15	□	MHS1110L200B	168.5	201.5	202.0	262.0	260	2.0	12	4
11.1	20	□	MHS1110L250B	224.0	251.5	252.0	312.0	310	2.0	12	4
11.1	24	□	MHS1110L300B	268.4	301.5	302.0	362.0	360	2.0	12	4
11.2	1	□	MHS1120L040B	13.1	41.4	41.9	101.9	100	1.9	12	3
11.2	5	□	MHS1120L090B	58.0	91.5	92.0	152.0	150	2.0	12	4
11.2	8	□	MHS1120L120B	91.6	121.5	122.0	182.0	180	2.0	12	4
11.2	11	□	MHS1120L150B	125.2	151.5	152.0	212.0	210	2.0	12	4
11.2	15	□	MHS1120L200B	170.0	201.5	202.0	262.0	260	2.0	12	4
11.2	20	□	MHS1120L250B	226.0	251.5	252.0	312.0	310	2.0	12	4
11.2	24	□	MHS1120L300B	270.8	301.5	302.0	362.0	360	2.0	12	4
11.3	1	□	MHS1130L040B	13.2	41.4	41.9	101.9	100	1.9	12	3
11.3	5	□	MHS1130L090B	58.6	91.6	92.1	152.1	150	2.1	12	4
11.3	8	□	MHS1130L120B	92.5	121.6	122.1	182.1	180	2.1	12	4
11.3	11	□	MHS1130L150B	126.4	151.6	152.1	212.1	210	2.1	12	4
11.3	15	□	MHS1130L200B	171.6	201.6	202.1	262.1	260	2.1	12	4
11.3	20	□	MHS1130L250B	228.1	251.6	252.1	312.1	310	2.1	12	4
11.3	24	□	MHS1130L300B	273.3	301.6	302.1	362.1	360	2.1	12	4
11.4	1	□	MHS1140L040B	13.4	41.5	42.0	102.0	100	2.0	12	3
11.4	5	□	MHS1140L090B	59.1	91.6	92.1	152.1	150	2.1	12	4
11.4	8	□	MHS1140L120B	93.3	121.6	122.1	182.1	180	2.1	12	4
11.4	11	□	MHS1140L150B	127.5	151.6	152.1	212.1	210	2.1	12	4

Note 1) 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.



DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
11.4	15	□	MHS1140L200B	173.1	201.6	202.1	262.1	260	2.1	12	4
11.4	19	□	MHS1140L250B	218.7	251.6	252.1	312.1	310	2.1	12	4
11.4	24	□	MHS1140L300B	275.7	301.6	302.1	362.1	360	2.1	12	4
11.5	1	●	MHS1150L040B	13.5	41.5	42.0	102.0	100	2.0	12	3
11.5	5	●	MHS1150L090B	59.6	91.6	92.1	152.1	150	2.1	12	4
11.5	8	●	MHS1150L120B	94.1	121.6	122.1	182.1	180	2.1	12	4
11.5	10	●	MHS1150L150B	117.1	151.6	152.1	212.1	210	2.1	12	4
11.5	15	●	MHS1150L200B	174.6	201.6	202.1	262.1	260	2.1	12	4
11.5	19	●	MHS1150L250B	220.6	251.6	252.1	312.1	310	2.1	12	4
11.5	24	●	MHS1150L300B	278.1	301.6	302.1	362.1	360	2.1	12	4
11.6	1	□	MHS1160L040B	13.6	42.0	42.0	102.0	100	2.0	12	3
11.6	5	□	MHS1160L090B	60.1	92.1	92.1	152.1	150	2.1	12	4
11.6	8	□	MHS1160L120B	94.9	122.1	122.1	182.1	180	2.1	12	4
11.6	10	□	MHS1160L150B	118.1	152.1	152.1	212.1	210	2.1	12	4
11.6	15	□	MHS1160L200B	176.1	202.1	202.1	262.1	260	2.1	12	4
11.6	19	□	MHS1160L250B	222.5	252.1	252.1	312.1	310	2.1	12	4
11.6	23	□	MHS1160L300B	268.9	302.1	302.1	362.1	360	2.1	12	4
11.7	1	□	MHS1170L040B	13.7	42.0	42.0	102.0	100	2.0	12	3
11.7	5	□	MHS1170L090B	60.6	92.1	92.1	152.1	150	2.1	12	4
11.7	8	□	MHS1170L120B	95.7	122.1	122.1	182.1	180	2.1	12	4
11.7	10	□	MHS1170L150B	119.1	152.1	152.1	212.1	210	2.1	12	4
11.7	15	□	MHS1170L200B	177.6	202.1	202.1	262.1	260	2.1	12	4
11.7	19	□	MHS1170L250B	224.4	252.1	252.1	312.1	310	2.1	12	4
11.7	23	□	MHS1170L300B	271.2	302.1	302.1	362.1	360	2.1	12	4

(mm)

DC	Hole Depth (L/D)	VPI5TF	Order Number	LU	LCF	LH	OAL	LF	PL	DCON	Type
11.8	1	●	MHS1180L040B	13.8	42.0	42.0	102.0	100	2.0	12	3
11.8	5	●	MHS1180L090B	61.1	92.1	92.1	152.1	150	2.1	12	4
11.8	8	●	MHS1180L120B	96.5	122.1	122.1	182.1	180	2.1	12	4
11.8	10	●	MHS1180L150B	120.1	152.1	152.1	212.1	210	2.1	12	4
11.8	14	●	MHS1180L200B	167.3	202.1	202.1	262.1	260	2.1	12	4
11.8	19	●	MHS1180L250B	226.3	252.1	252.1	312.1	310	2.1	12	4
11.8	23	●	MHS1180L300B	273.5	302.1	302.1	362.1	360	2.1	12	4
11.9	1	□	MHS1190L040B	13.9	42.0	42.0	102.0	100	2.0	12	3
11.9	5	□	MHS1190L090B	61.7	92.2	92.2	152.2	150	2.2	12	4
11.9	8	□	MHS1190L120B	97.4	122.2	122.2	182.2	180	2.2	12	4
11.9	10	□	MHS1190L150B	121.2	152.2	152.2	212.2	210	2.2	12	4
11.9	14	□	MHS1190L200B	168.8	202.2	202.2	262.2	260	2.2	12	4
11.9	19	□	MHS1190L250B	228.3	252.2	252.2	312.2	310	2.2	12	4
11.9	23	□	MHS1190L300B	275.9	302.2	302.2	362.2	360	2.2	12	4
12.0	1	●	MHS1200L040B	14.1	42.1	42.1	102.1	100	2.1	12	3
12.0	5	●	MHS1200L090B	62.2	92.2	92.2	152.2	150	2.2	12	4
12.0	7	●	MHS1200L120B	86.2	122.2	122.2	182.2	180	2.2	12	4
12.0	10	●	MHS1200L150B	122.2	152.2	152.2	212.2	210	2.2	12	4
12.0	14	●	MHS1200L200B	170.2	202.2	202.2	262.2	260	2.2	12	4
12.0	18	●	MHS1200L250B	218.2	252.2	252.2	312.2	310	2.2	12	4
12.0	22	●	MHS1200L300B	266.2	302.2	302.2	362.2	360	2.2	12	4

DC = Cutting Diameter  
 LU = Usable Length  
 LCF = Length Chip Flute

LH = Neck Length  
 OAL = Overall Length  
 LF = Functional Length

PL = Point Length  
 DCON = Connection Diameter

## Recommended Cutting Conditions

(mm)

Workpiece Material	Mild Steels ( $\leq 180\text{HB}$ ), Carbon Steels, Alloy Steels (180–280HB)				Ferritic, Precipitation Hardening Stainless Steels ( $>200\text{HB}$ )			
	JIS SS400, S10C, JIS S45C, SCM440 etc				JIS SUS431, SUS420J2 etc			
Dia. DC	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	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
2.0	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
4.0	80	6400	0.100 (0.090–0.110)	640	60	4800	0.090 (0.080–0.090)	430
5.0	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
8.0	80	3200	0.200 (0.180–0.230)	640	60	2400	0.170 (0.160–0.190)	410
10.0	80	2600	0.250 (0.220–0.280)	650	60	1900	0.220 (0.200–0.230)	420
12.0	80	2100	0.300 (0.270–0.340)	630	60	1600	0.260 (0.240–0.280)	415

Workpiece Material	Pre-hardened Steels (35–45HRC), Alloy Tool Steels ( $\leq 350$ )				Stainless Steels (40–55HRC), Precipitation Hardening Stainless Steels ( $<450\text{HB}$ )			
	NAK, PX5, JIS SKD, SKT etc				STAVAX, JIS SUS431, SUS420J2, SUS630, SUS631 etc			
Dia. DC	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	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
2.0	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
4.0	60	4800	0.080 (0.070–0.100)	385	60	4800	0.080 (0.060–0.100)	385
5.0	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
8.0	60	2400	0.170 (0.140–0.200)	410	60	2400	0.140 (0.120–0.160)	335
10.0	60	1900	0.210 (0.170–0.250)	400	60	1900	0.170 (0.140–0.200)	325
12.0	60	1600	0.250 (0.210–0.300)	400	60	1600	0.210 (0.170–0.240)	335

Workpiece Material	Hardened Steels (40–55HRC), Heat Resistant Alloys			
	Inconel718 JIS SKD61, SKT4 etc			
Dia. DC	Cutting Speed (m/min)	Revolution ( $\text{min}^{-1}$ )	Feed rate (Min.–Max.) (mm/rev)	Table Feed (mm/min)
1.0	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
2.0	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
4.0	30	2400	0.070 (0.050–0.080)	170
5.0	30	1900	0.080 (0.060–0.100)	150
6.3	30	1500	0.090 (0.080–0.110)	135
8.0	40	1600	0.120 (0.100–0.130)	190
10.0	40	1300	0.150 (0.130–0.170)	195
12.0	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 prep holes as a guide.

(If no prep-hole is used then drill breakage can occur)

Note 2) Setting of the diameter tolerance differs from general-purpose drills. MHS shortest flute drills are recommended for prep hole machining.

Note 3) MHS drills are suitable for use with shrink fit holders.

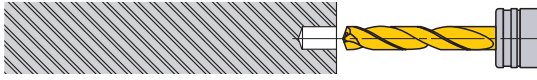
Note 4) Use the shortest type in the respective diameter as a pilot drill.



## Operational Guidance for the MHS Long Type Drill ( $L/D \geq 10$ )

### Flat Face Drilling ● Drilling a Blind Hole

#### 1. Drilling a Pilot Hole



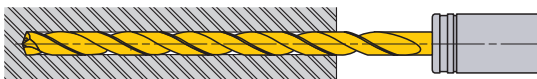
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx  $DC \times 1$ .  
(Adjust the pilot hole depth according to the length of the long type drill.)

#### 2. Initial Cutting with the Long Type Drill



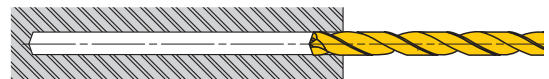
- ① Penetrate the guide hole at low revolution. (Revolution  $1000\text{min}^{-1}$ , feed rate  $0.2-0.3\text{mm/rev}$ )
- ② Stop the long type drill  $1-3\text{mm}$  short of the guide hole bottom.

#### 3. Drill the Deep Hole



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

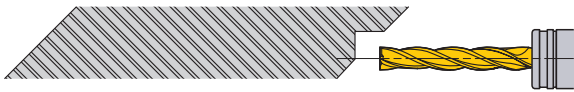
#### 4. Drill Retraction



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

### 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



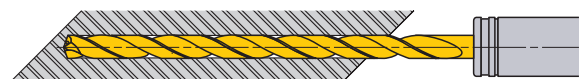
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx  $DC \times 1$ .  
(Adjust the pilot hole depth according to the length of the long type drill.)

#### 3. Initial Cutting with the Long Type Drill



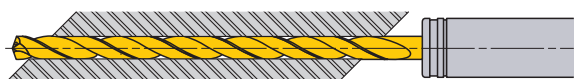
- ① Penetrate the guide hole at a low revolution. (Revolution  $1000\text{min}^{-1}$ , feed rate  $0.2-0.3\text{mm/rev}$ )
- ② Stop the long type drill  $0.5-1\text{mm}$  short of the guide hole bottom.

#### 4. Drill the Deep Hole



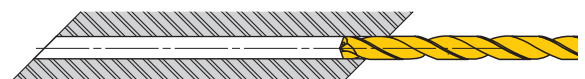
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

#### 5. Breaking Through



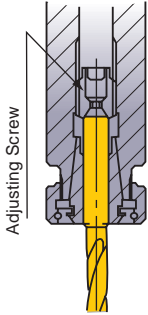
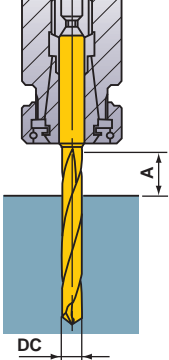
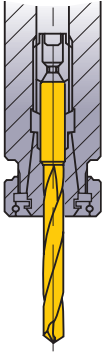
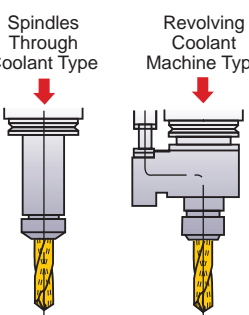
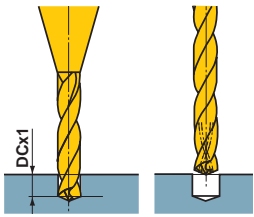
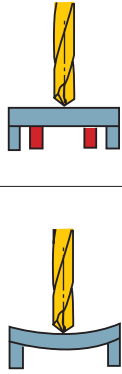
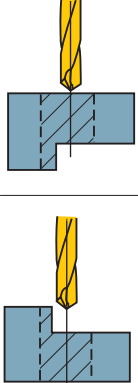
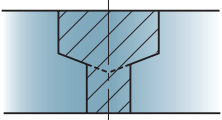
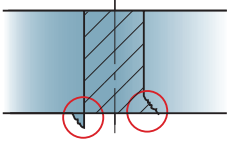
- ① When breaking through, the cutting edge can be damaged.
- ② Lower the feed rate when penetrating.

#### 6. Drill Retraction



- ① Finally clear the hole at a feed rate of  $0.2-0.3\text{mm/rev}$ . (Revolution of around  $1000\text{min}^{-1}$ )
- ② Retract the drill to the pilot hole depth starting point at a feed rate of  $3000\text{mm/min}$ .

## Operational Guidance

<p><b>Drill Holding</b></p>  <p>Thrust bearing type collet chuck holds the drill securely.</p>	<p><b>Drill Length</b></p>  <p><math>A \geq DC \times 2</math></p>	<p><b>Drill Installation</b></p>  <p>Do not clamp on the flutes.</p>	<p><b>Coolant Method</b></p>  <p>Less than <math>\phi 3\text{mm}</math> : 1.5MPa-7MP More than <math>\phi 3\text{mm}</math> : 0.5MPa-7MPa More than 3MPa is recommended.</p>
<p><b>Drill Installation</b></p>  <ol style="list-style-type: none"> <li>1) Make approx. <math>DC \times 1</math> (<math>DC</math>=drill diameter) pilot hole by using the MHS with the shortest flutes.</li> <li>2) Use the pilot hole as a guide and machine by the drill with coolant hole. Depending on the application, carry out pecking.</li> </ol>	<p><b>Coolant Handling</b></p> <ol style="list-style-type: none"> <li>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.</li> <li>2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.</li> </ol>	<p><b>Thin Workpiece</b></p>  <p>Support the Workpiece <b>OK</b></p> <p>If Bending Occurs <b>NG</b></p>	<p><b>Interrupted Cutting</b></p>  <p>One Process <b>OK</b> ① Lower the feed when drilling the interrupted part.</p> <p>Requires Prior Machining ① Spot face with an end mill prior to drilling.</p>
<p><b>Stepped Holes</b></p>  <ol style="list-style-type: none"> <li>① Divide the two processes.</li> <li>② Drill the larger hole first.</li> </ol> <p>*A tool for machining both chamfer and spot face can be produced to order.</p>	<p><b>Burring and Workpiece Chipping</b></p>  <ol style="list-style-type: none"> <li>① Lower the feed rate by 50% at the end of through cutting.</li> <li>② Change the point angle.</li> </ol>		

### 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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