

Drills for die & mould machining.

Innovative drilling solutions for hardened steel!

**Possible to machine high precision
deep holes for resin and die casting moulds!**

**Eliminates the need for a heat
treatment process.**



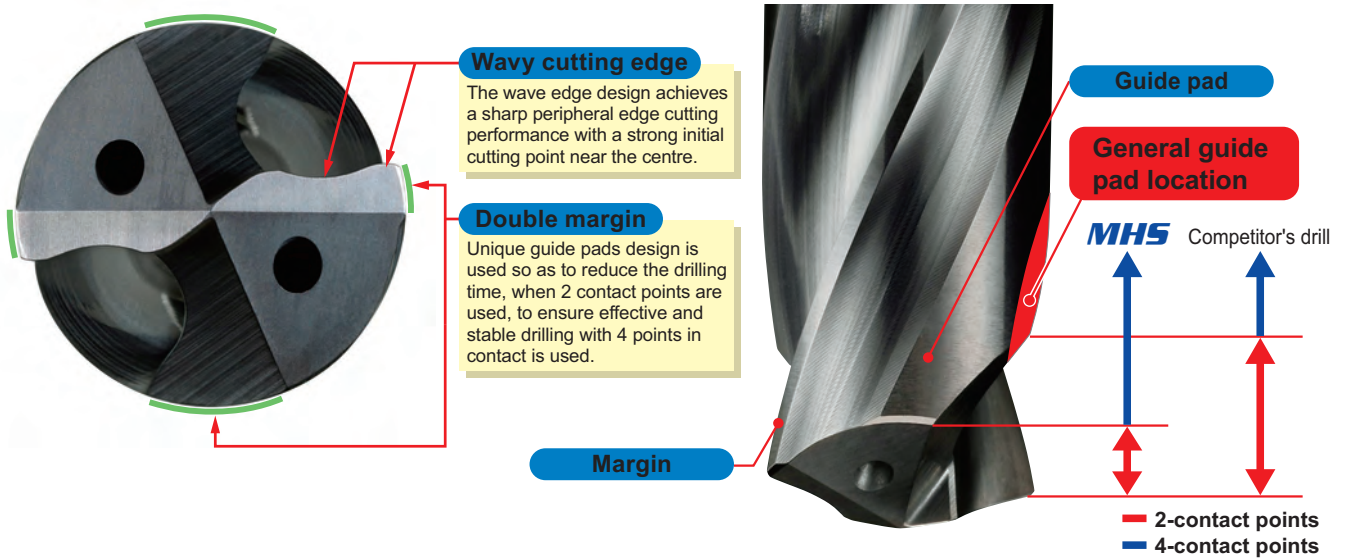
- Drill sizes available in 0.5mm increments from $\varnothing 3.0$ through to $\varnothing 12.0$.
- Short shank pilot drills also available.
- Flute lengths designed for use with the various plates thicknesses used in the die & mould industry, available in lengths of 40, 60, 90, 120, 150, 200, 250 and 300mm.
- Shank diameters suitable for use with collets.

Solid Carbide Drill for Die & Mould Machining

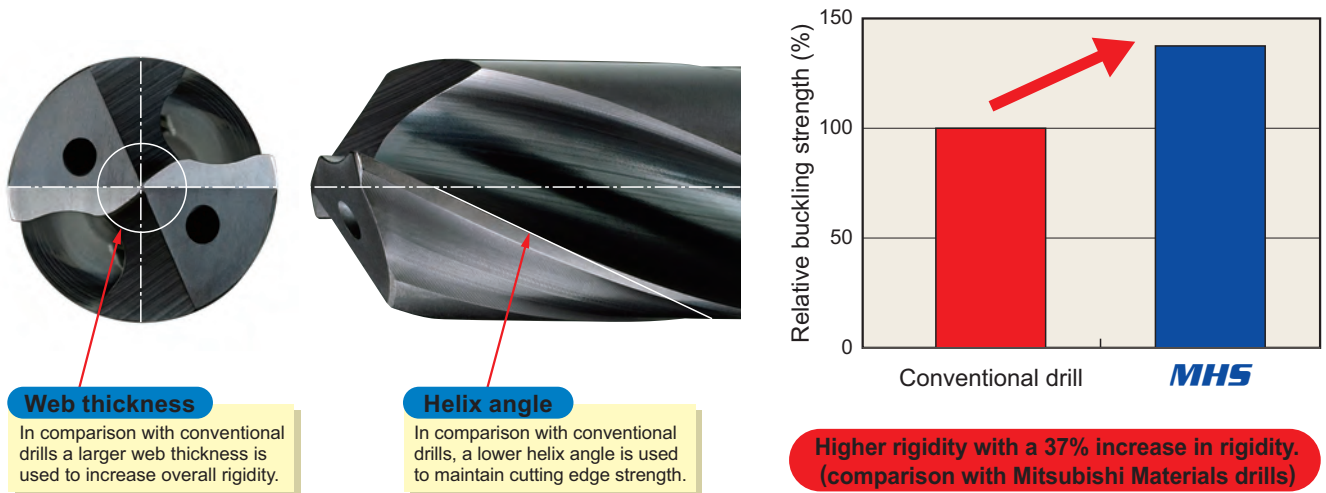
MHS Drills

Features

Stable machining can be obtained due to the unique cutting edge geometry & double margin flute

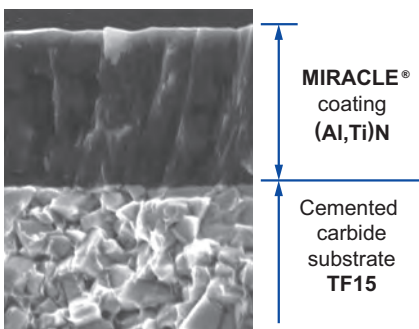


Strong geometry for stable machining of moulds



Tough carbide grade

● Long tool life MIRACLE® coated VP15TF



VP15T

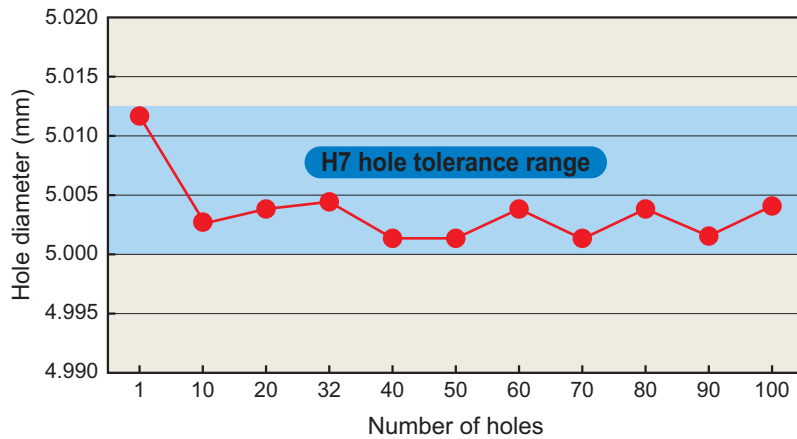


Features of VP15TF

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

Cutting Performance

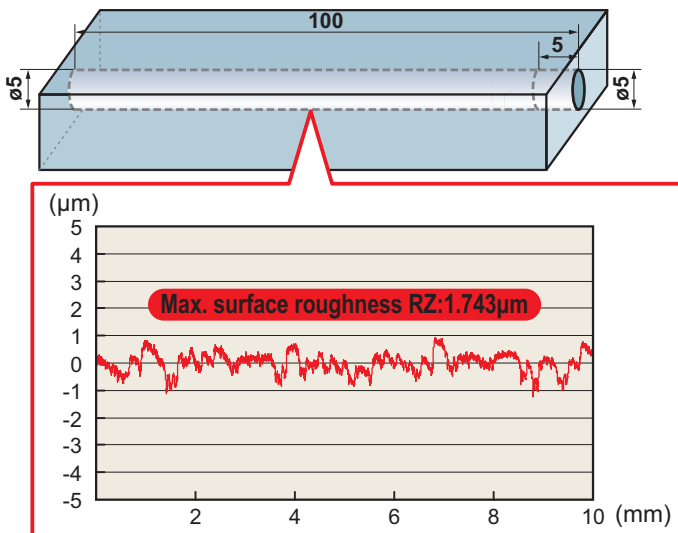
- Unique geometry specially designed for die and mould machining.
- High precision (oversize) (48–50HRC)



<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

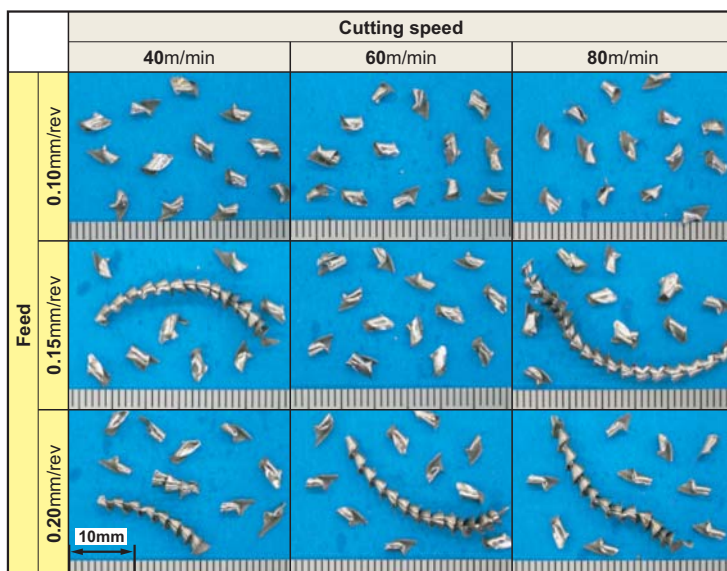
High precision (surface roughness) (48–50HRC)



<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 efficiency drilling (continuous feed) (40HRC)

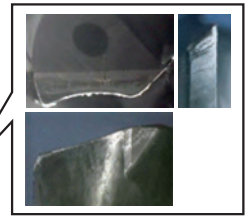
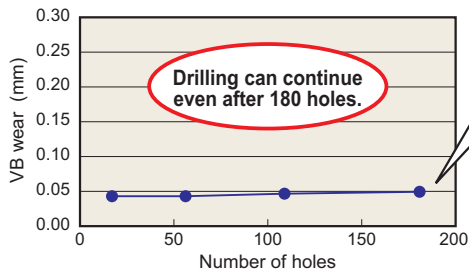
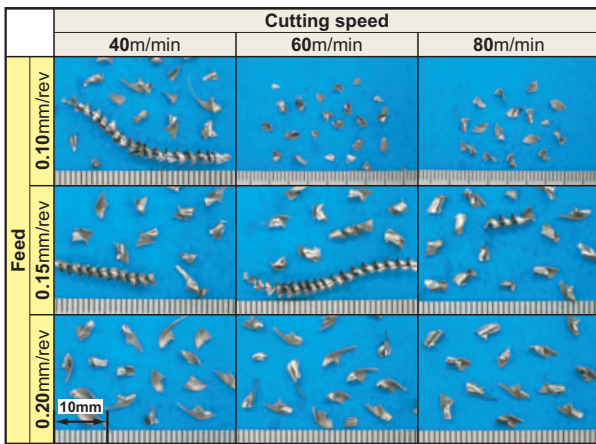


<Cutting conditions>
 Workpiece : CENA1 (Plastic mould steel)
 Hardness : 40HRC
 Drill : MHS0600L150B (ø6mm)
 Hole depth : 115mm
 Cutting speed : 60m/min
 Feed : 0.15mm/rev (continuous)
 Feed Rate : 477mm/min
 Coolant : W.S.O.
 Emission pressure : 2MPa (Internal coolant)
 Machine : Machining centre

<Cutting conditions for pilot drilling>
 Drill : MHS0600L030B (ø6mm)
 Hole depth : 6mm
 Cutting speed : 60m/min
 Feed : 0.15mm/rev

Cutting performance on different materials

Chromium-alloy stainless steel (33HRC)

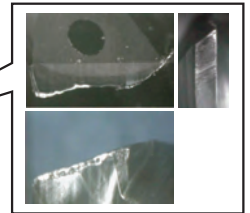
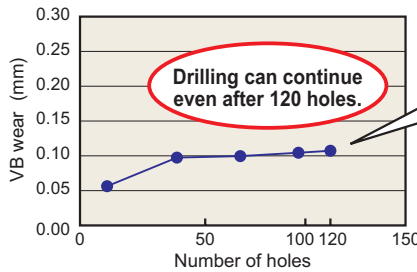
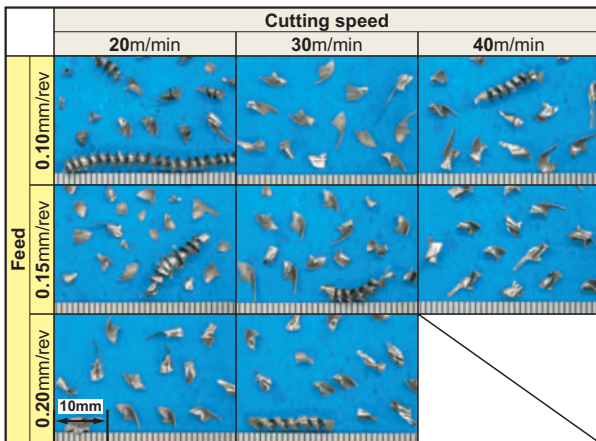


<Cutting conditions>
 Workpiece : Chromium-alloy stainless steel
 Hardness : 33HRC
 Drill : MHS0600L150B (ø6mm)
 Hole depth : 115mm (Through hole)
 Coolant : W.S.O.
 Emission pressure : 2MPa
 (Internal coolant)

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

<Cutting conditions for pilot drilling>
 Drill : MHS0600L030B (ø6mm)
 Hole depth : 6mm
 Cutting speed : 40m/min
 Feed : 0.15mm/rev

Die-cast mould steel (45HRC)



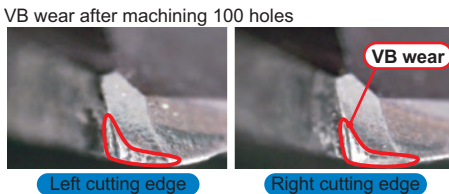
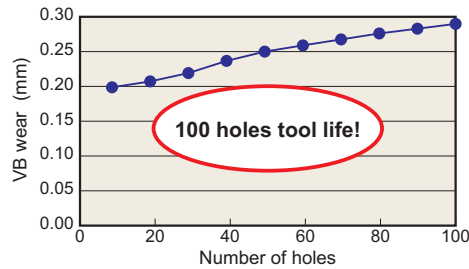
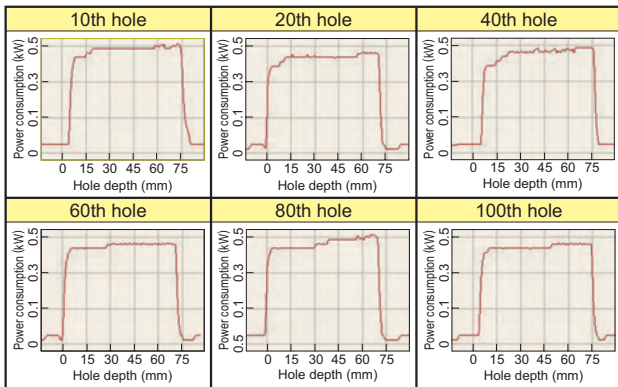
<Cutting conditions>
 Workpiece : Die-cast mould steel
 Hardness : 45HRC
 Drill : MHS0600L150B (ø6mm)
 Hole depth : 115mm
 Coolant : W.S.O.
 Emission pressure : 2MPa
 (Internal coolant)

<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

Alloy tool steel (50HRC)

Change in power consumption

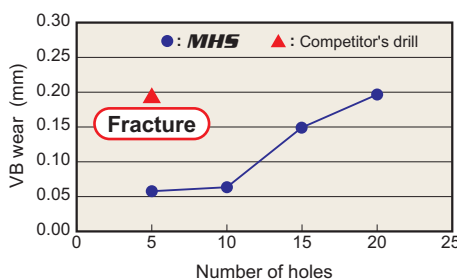


<Cutting conditions>
 Workpiece : Alloy tool steel
 Hardness : 50HRC
 Drill : MHS0500L090B (ø5mm)
 Hole depth : 70mm
 Cutting speed : 20m/min
 Feed : 0.15mm/rev
 (continuous)
 Feed Rate : 191mm/min
 Coolant : W.S.O.
 Emission pressure : 2MPa
 (Internal coolant)
 Machine : Machining centre

<Cutting conditions for pilot drilling>
 Drill : MHS0500L020B (ø5mm)
 Hole depth : 5mm
 Cutting speed : 20m/min
 Feed : 0.15mm/rev

Mould steel (55HRC)

Cutting edge condition after 5 holes

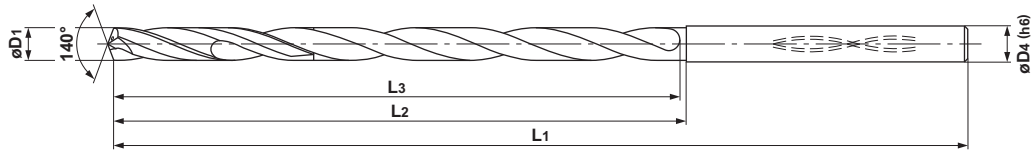


<Cutting conditions>
 Workpiece : Mould steel
 Hardness : 55HRC
 Drill : MHS0600L120B (ø6mm)
 Hole depth : 95mm
 Cutting speed : 20m/min
 Feed : 0.05mm/rev
 (continuous)
 Feed Rate : 53mm/min
 Coolant : W.S.O.
 Emission pressure : 2MPa
 (Internal coolant)
 Machine : Machining centre

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



| D1 | 3.0≤D1≤6.0 | 6.0<D1≤10.0 | 10.0<D1≤12.0 |
|----------------|------------------|------------------|------------------|
| Tolerance (mm) | +0.010 -0.002 | +0.010 -0.005 | +0.010 -0.008 |



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.

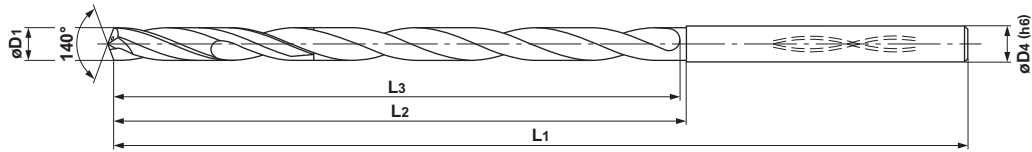
| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|----|-----|-----|
| | | | | | L3 | L2 | L1 | D4 |
| 3.0 | 4 | Int. | ★ | MHS0300L020B | 19.0 | 20 | 70 | 4.0 |
| | 10 | Int. | ★ | 0300L040B | 39.0 | 40 | 90 | 4.0 |
| | 17 | Int. | ★ | 0300L060B | 59.0 | 60 | 110 | 4.0 |
| | 27 | Int. | ★ | 0300L090B | 89.0 | 90 | 140 | 4.0 |
| 3.1 | 4 | Int. | □ | 0310L020B | 19.5 | 20 | 70 | 4.0 |
| | 10 | Int. | □ | 0310L040B | 39.5 | 40 | 90 | 4.0 |
| | 17 | Int. | □ | 0310L060B | 59.5 | 60 | 110 | 4.0 |
| 3.2 | 4 | Int. | □ | 0320L020B | 19.5 | 20 | 70 | 4.0 |
| | 10 | Int. | □ | 0320L040B | 39.5 | 40 | 90 | 4.0 |
| | 16 | Int. | □ | 0320L060B | 59.5 | 60 | 110 | 4.0 |
| 3.3 | 3 | Int. | □ | 0330L020B | 19.5 | 20 | 70 | 4.0 |
| | 9 | Int. | □ | 0330L040B | 39.5 | 40 | 90 | 4.0 |
| | 16 | Int. | □ | 0330L060B | 59.5 | 60 | 110 | 4.0 |
| 3.4 | 3 | Int. | □ | 0340L020B | 19.5 | 20 | 70 | 4.0 |
| | 9 | Int. | □ | 0340L040B | 39.5 | 40 | 90 | 4.0 |
| | 15 | Int. | □ | 0340L060B | 59.5 | 60 | 110 | 4.0 |
| | 24 | Int. | □ | 0340L090B | 89.5 | 90 | 140 | 4.0 |
| 3.5 | 3 | Int. | ★ | 0350L020B | 19.5 | 20 | 70 | 4.0 |
| | 9 | Int. | ★ | 0350L040B | 39.5 | 40 | 90 | 4.0 |
| | 14 | Int. | ★ | 0350L060B | 59.5 | 60 | 110 | 4.0 |
| | 23 | Int. | ★ | 0350L090B | 89.5 | 90 | 140 | 4.0 |
| 3.6 | 3 | Int. | □ | 0360L020B | 20.0 | 20 | 70 | 4.0 |
| | 9 | Int. | □ | 0360L040B | 40.0 | 40 | 90 | 4.0 |
| | 14 | Int. | □ | 0360L060B | 60.0 | 60 | 110 | 4.0 |
| | 22 | Int. | □ | 0360L090B | 90.0 | 90 | 140 | 4.0 |
| 3.7 | 3 | Int. | □ | 0370L020B | 20.0 | 20 | 70 | 4.0 |
| | 8 | Int. | □ | 0370L040B | 40.0 | 40 | 90 | 4.0 |
| | 14 | Int. | □ | 0370L060B | 60.0 | 60 | 110 | 4.0 |
| | 22 | Int. | □ | 0370L090B | 90.0 | 90 | 140 | 4.0 |
| 3.8 | 3 | Int. | □ | 0380L020B | 20.0 | 20 | 70 | 4.0 |
| | 8 | Int. | □ | 0380L040B | 40.0 | 40 | 90 | 4.0 |
| | 13 | Int. | □ | 0380L060B | 60.0 | 60 | 110 | 4.0 |
| | 21 | Int. | □ | 0380L090B | 90.0 | 90 | 140 | 4.0 |
| 3.9 | 3 | Int. | □ | 0390L020B | 20.0 | 20 | 70 | 4.0 |
| | 8 | Int. | □ | 0390L040B | 40.0 | 40 | 90 | 4.0 |
| | 13 | Int. | □ | 0390L060B | 60.0 | 60 | 110 | 4.0 |
| | 21 | Int. | □ | 0390L090B | 90.0 | 90 | 140 | 4.0 |
| 4.0 | 2 | Int. | ★ | 0400L020B | 20.0 | 20 | 70 | 4.0 |
| | 7 | Int. | ★ | 0400L040B | 40.0 | 40 | 90 | 4.0 |
| | 12 | Int. | ★ | 0400L060B | 60.0 | 60 | 110 | 4.0 |
| | 20 | Int. | ★ | 0400L090B | 90.0 | 90 | 140 | 4.0 |

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|-----|-----|
| | | | | | L3 | L2 | L1 | D4 |
| 4.1 | 2 | Int. | □ | MHS0410L020B | 18.5 | 20 | 70 | 6.0 |
| | 7 | Int. | □ | 0410L040B | 38.5 | 40 | 90 | 6.0 |
| | 12 | Int. | □ | 0410L060B | 58.5 | 60 | 110 | 6.0 |
| | 19 | Int. | □ | 0410L090B | 88.5 | 90 | 140 | 6.0 |
| | 26 | Int. | □ | 0410L120B | 118.5 | 120 | 170 | 6.0 |
| 4.2 | 2 | Int. | □ | 0420L020B | 18.5 | 20 | 70 | 6.0 |
| | 7 | Int. | □ | 0420L040B | 38.5 | 40 | 90 | 6.0 |
| | 11 | Int. | □ | 0420L060B | 58.5 | 60 | 110 | 6.0 |
| | 19 | Int. | □ | 0420L090B | 88.5 | 90 | 140 | 6.0 |
| 4.3 | 2 | Int. | □ | 0430L020B | 18.5 | 20 | 70 | 6.0 |
| | 6 | Int. | □ | 0430L040B | 38.5 | 40 | 90 | 6.0 |
| | 11 | Int. | □ | 0430L060B | 58.5 | 60 | 110 | 6.0 |
| | 18 | Int. | □ | 0430L090B | 88.5 | 90 | 140 | 6.0 |
| 4.4 | 2 | Int. | □ | 0440L020B | 18.5 | 20 | 70 | 6.0 |
| | 6 | Int. | □ | 0440L040B | 38.5 | 40 | 90 | 6.0 |
| | 11 | Int. | □ | 0440L060B | 58.5 | 60 | 110 | 6.0 |
| | 18 | Int. | □ | 0440L090B | 88.5 | 90 | 140 | 6.0 |
| 4.5 | 2 | Int. | ★ | 0450L020B | 18.5 | 20 | 70 | 6.0 |
| | 6 | Int. | ★ | 0450L040B | 38.5 | 40 | 90 | 6.0 |
| | 10 | Int. | ★ | 0450L060B | 58.5 | 60 | 110 | 6.0 |
| | 17 | Int. | ★ | 0450L090B | 88.5 | 90 | 140 | 6.0 |
| 4.6 | 2 | Int. | □ | 0460L020B | 19.0 | 20 | 70 | 6.0 |
| | 6 | Int. | □ | 0460L040B | 39.0 | 40 | 90 | 6.0 |
| | 10 | Int. | □ | 0460L060B | 59.0 | 60 | 110 | 6.0 |
| | 17 | Int. | □ | 0460L090B | 89.0 | 90 | 140 | 6.0 |
| 4.7 | 2 | Int. | □ | 0470L020B | 19.0 | 20 | 70 | 6.0 |
| | 6 | Int. | □ | 0470L040B | 39.0 | 40 | 90 | 6.0 |
| | 10 | Int. | □ | 0470L060B | 59.0 | 60 | 110 | 6.0 |
| | 16 | Int. | □ | 0470L090B | 89.0 | 90 | 140 | 6.0 |
| 4.8 | 1 | Int. | □ | 0480L020B | 19.0 | 20 | 70 | 6.0 |
| | 6 | Int. | □ | 0480L040B | 39.0 | 40 | 90 | 6.0 |
| | 10 | Int. | □ | 0480L060B | 59.0 | 60 | 110 | 6.0 |
| | 16 | Int. | □ | 0480L090B | 89.0 | 90 | 140 | 6.0 |
| 4.9 | 1 | Int. | □ | 0490L020B | 19.0 | 20 | 70 | 6.0 |
| | 5 | Int. | □ | 0490L040B | 39.0 | 40 | 90 | 6.0 |
| | 10 | Int. | □ | 0490L060B | 59.0 | 60 | 110 | 6.0 |
| | 16 | Int. | □ | 0490L090B | 89.0 | 90 | 140 | 6.0 |

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

Solid Carbide Drill for Die & Mould Machining

MHS Drills



| D1 | 3.0≤D1≤6.0 | 6.0<D1≤10.0 | 10.0<D1≤12.0 |
|----------------|------------------|------------------|------------------|
| Tolerance (mm) | +0.010 -0.002 | +0.010 -0.005 | +0.010 -0.008 |

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 | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|------|-----|-----|
| | | | | | L3 | L2 | L1 | D4 |
| 5.0 | 1 | Int. | ★ | MHS0500L020B | 19.0 | 20 | 70 | 6.0 |
| | 5 | Int. | ★ | 0500L040B | 39.0 | 40 | 90 | 6.0 |
| | 9 | Int. | ★ | 0500L060B | 59.0 | 60 | 110 | 6.0 |
| | 15 | Int. | ★ | 0500L090B | 89.0 | 90 | 140 | 6.0 |
| | 21 | Int. | ★ | 0500L120B | 119.0 | 120 | 170 | 6.0 |
| | 27 | Int. | ★ | 0500L150B | 149.0 | 150 | 200 | 6.0 |
| 5.1 | 3 | Int. | □ | 0510L030B | 29.5 | 30 | 80 | 6.0 |
| | 9 | Int. | □ | 0510L060B | 59.5 | 60 | 110 | 6.0 |
| | 15 | Int. | □ | 0510L090B | 89.5 | 90 | 140 | 6.0 |
| | 21 | Int. | □ | 0510L120B | 119.5 | 120 | 170 | 6.0 |
| | 27 | Int. | □ | 0510L150B | 149.5 | 150 | 200 | 6.0 |
| 5.2 | 3 | Int. | □ | 0520L030B | 29.5 | 30 | 80 | 6.0 |
| | 9 | Int. | □ | 0520L060B | 59.5 | 60 | 110 | 6.0 |
| | 15 | Int. | □ | 0520L090B | 89.5 | 90 | 140 | 6.0 |
| | 20 | Int. | □ | 0520L120B | 119.5 | 120 | 170 | 6.0 |
| | 26 | Int. | □ | 0520L150B | 149.5 | 150 | 200 | 6.0 |
| | 5.3 | 3 | Int. | □ | 0530L030B | 29.5 | 30 | 80 |
| 9 | | Int. | □ | 0530L060B | 59.5 | 60 | 110 | 6.0 |
| 14 | | Int. | □ | 0530L090B | 89.5 | 90 | 140 | 6.0 |
| 20 | | Int. | □ | 0530L120B | 119.5 | 120 | 170 | 6.0 |
| 26 | | Int. | □ | 0530L150B | 149.5 | 150 | 200 | 6.0 |
| 5.4 | | 3 | Int. | □ | 0540L030B | 29.5 | 30 | 80 |
| | 9 | Int. | □ | 0540L060B | 59.5 | 60 | 110 | 6.0 |
| | 14 | Int. | □ | 0540L090B | 89.5 | 90 | 140 | 6.0 |
| | 20 | Int. | □ | 0540L120B | 119.5 | 120 | 170 | 6.0 |
| | 25 | Int. | □ | 0540L150B | 149.5 | 150 | 200 | 6.0 |
| 5.5 | 3 | Int. | ★ | 0550L030B | 29.5 | 30 | 80 | 6.0 |
| | 8 | Int. | ★ | 0550L060B | 59.5 | 60 | 110 | 6.0 |
| | 14 | Int. | ★ | 0550L090B | 89.5 | 90 | 140 | 6.0 |
| | 19 | Int. | ★ | 0550L120B | 119.5 | 120 | 170 | 6.0 |
| | 25 | Int. | ★ | 0550L150B | 149.5 | 150 | 200 | 6.0 |
| 5.6 | 3 | Int. | □ | 0560L030B | 30.0 | 30 | 80 | 6.0 |
| | 8 | Int. | □ | 0560L060B | 60.0 | 60 | 110 | 6.0 |
| | 14 | Int. | □ | 0560L090B | 90.0 | 90 | 140 | 6.0 |
| | 19 | Int. | □ | 0560L120B | 120.0 | 120 | 170 | 6.0 |
| | 24 | Int. | □ | 0560L150B | 150.0 | 150 | 200 | 6.0 |
| 5.7 | 3 | Int. | □ | 0570L030B | 30.0 | 30 | 80 | 6.0 |
| | 8 | Int. | □ | 0570L060B | 60.0 | 60 | 110 | 6.0 |
| | 13 | Int. | □ | 0570L090B | 90.0 | 90 | 140 | 6.0 |
| | 19 | Int. | □ | 0570L120B | 120.0 | 120 | 170 | 6.0 |
| | 24 | Int. | □ | 0570L150B | 150.0 | 150 | 200 | 6.0 |
| 5.8 | 3 | Int. | □ | 0580L030B | 30.0 | 30 | 80 | 6.0 |
| | 8 | Int. | □ | 0580L060B | 60.0 | 60 | 110 | 6.0 |
| | 13 | Int. | □ | 0580L090B | 90.0 | 90 | 140 | 6.0 |
| | 18 | Int. | □ | 0580L120B | 120.0 | 120 | 170 | 6.0 |
| | 23 | Int. | □ | 0580L150B | 150.0 | 150 | 200 | 6.0 |
| 5.9 | 3 | Int. | □ | 0590L030B | 30.0 | 30 | 80 | 6.0 |
| | 8 | Int. | □ | 0590L060B | 60.0 | 60 | 110 | 6.0 |
| | 13 | Int. | □ | 0590L090B | 90.0 | 90 | 140 | 6.0 |
| | 18 | Int. | □ | 0590L120B | 120.0 | 120 | 170 | 6.0 |
| | 23 | Int. | □ | 0590L150B | 150.0 | 150 | 200 | 6.0 |

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|-----|-----|
| | | | | | L3 | L2 | L1 | D4 |
| 6.0 | 2 | Int. | ★ | MHS0600L030B | 30.0 | 30 | 80 | 6.0 |
| | 7 | Int. | ★ | 0600L060B | 60.0 | 60 | 110 | 6.0 |
| | 12 | Int. | ★ | 0600L090B | 90.0 | 90 | 140 | 6.0 |
| | 17 | Int. | ★ | 0600L120B | 120.0 | 120 | 170 | 6.0 |
| | 22 | Int. | ★ | 0600L150B | 150.0 | 150 | 200 | 6.0 |
| 6.1 | 2 | Int. | □ | 0610L030B | 28.5 | 30 | 80 | 8.0 |
| | 7 | Int. | □ | 0610L060B | 58.5 | 60 | 110 | 8.0 |
| | 12 | Int. | □ | 0610L090B | 88.5 | 90 | 140 | 8.0 |
| | 17 | Int. | □ | 0610L120B | 118.5 | 120 | 170 | 8.0 |
| | 22 | Int. | □ | 0610L150B | 148.5 | 150 | 200 | 8.0 |
| 6.2 | 2 | Int. | □ | 0620L030B | 28.5 | 30 | 80 | 8.0 |
| | 7 | Int. | □ | 0620L060B | 58.5 | 60 | 110 | 8.0 |
| | 12 | Int. | □ | 0620L090B | 88.5 | 90 | 140 | 8.0 |
| | 17 | Int. | □ | 0620L120B | 118.5 | 120 | 170 | 8.0 |
| | 21 | Int. | □ | 0620L150B | 148.5 | 150 | 200 | 8.0 |
| 6.3 | 2 | Int. | □ | 0630L030B | 28.5 | 30 | 80 | 8.0 |
| | 7 | Int. | □ | 0630L060B | 58.5 | 60 | 110 | 8.0 |
| | 12 | Int. | □ | 0630L090B | 88.5 | 90 | 140 | 8.0 |
| | 16 | Int. | □ | 0630L120B | 118.5 | 120 | 170 | 8.0 |
| | 21 | Int. | □ | 0630L150B | 148.5 | 150 | 200 | 8.0 |
| 6.4 | 2 | Int. | □ | 0640L030B | 28.5 | 30 | 80 | 8.0 |
| | 7 | Int. | □ | 0640L060B | 58.5 | 60 | 110 | 8.0 |
| | 11 | Int. | □ | 0640L090B | 88.5 | 90 | 140 | 8.0 |
| | 16 | Int. | □ | 0640L120B | 118.5 | 120 | 170 | 8.0 |
| | 21 | Int. | □ | 0640L150B | 148.5 | 150 | 200 | 8.0 |
| 6.5 | 2 | Int. | ★ | 0650L030B | 28.5 | 30 | 80 | 8.0 |
| | 6 | Int. | ★ | 0650L060B | 58.5 | 60 | 110 | 8.0 |
| | 11 | Int. | ★ | 0650L090B | 88.5 | 90 | 140 | 8.0 |
| | 16 | Int. | ★ | 0650L120B | 118.5 | 120 | 170 | 8.0 |
| | 20 | Int. | ★ | 0650L150B | 148.5 | 150 | 200 | 8.0 |
| 6.6 | 2 | Int. | □ | 0660L030B | 29.0 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0660L060B | 59.0 | 60 | 110 | 8.0 |
| | 11 | Int. | □ | 0660L090B | 89.0 | 90 | 140 | 8.0 |
| | 16 | Int. | □ | 0660L120B | 119.0 | 120 | 170 | 8.0 |
| | 20 | Int. | □ | 0660L150B | 149.0 | 150 | 200 | 8.0 |
| | 28 | Int. | □ | 0660L200B | 199.0 | 200 | 250 | 8.0 |
| 6.7 | 2 | Int. | □ | 0670L030B | 29.0 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0670L060B | 59.0 | 60 | 110 | 8.0 |
| | 11 | Int. | □ | 0670L090B | 89.0 | 90 | 140 | 8.0 |
| | 15 | Int. | □ | 0670L120B | 119.0 | 120 | 170 | 8.0 |
| | 20 | Int. | □ | 0670L150B | 149.0 | 150 | 200 | 8.0 |
| | 27 | Int. | □ | 0670L200B | 199.0 | 200 | 250 | 8.0 |
| 6.8 | 2 | Int. | □ | 0680L030B | 29.0 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0680L060B | 59.0 | 60 | 110 | 8.0 |
| | 11 | Int. | □ | 0680L090B | 89.0 | 90 | 140 | 8.0 |
| | 15 | Int. | □ | 0680L120B | 119.0 | 120 | 170 | 8.0 |
| | 19 | Int. | □ | 0680L150B | 149.0 | 150 | 200 | 8.0 |
| 27 | Int. | □ | 0680L200B | 199.0 | 200 | 250 | 8.0 | |

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

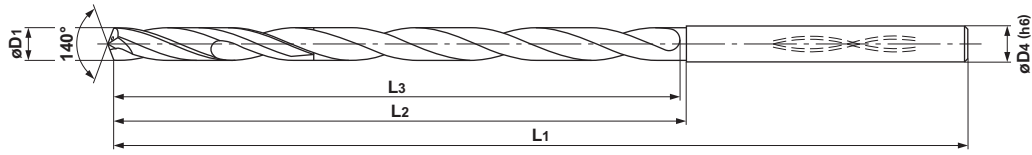
★ : Inventory maintained in Japan. □ : Non stock, produced to order only.

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|-----|-----|
| | | | | | L3 | L2 | L1 | D4 |
| 6.9 | 2 | Int. | □ | MHS0690L030B | 29.0 | 30 | 80 | 8.0 |
| | 6 | Int. | ★ | 0690L060B | 59.0 | 60 | 110 | 8.0 |
| | 10 | Int. | □ | 0690L090B | 89.0 | 90 | 140 | 8.0 |
| | 15 | Int. | □ | 0690L120B | 119.0 | 120 | 170 | 8.0 |
| | 19 | Int. | □ | 0690L150B | 149.0 | 150 | 200 | 8.0 |
| | 26 | Int. | □ | 0690L200B | 199.0 | 200 | 250 | 8.0 |
| 7.0 | 2 | Int. | ★ | 0700L030B | 29.0 | 30 | 80 | 8.0 |
| | 6 | Int. | ★ | 0700L060B | 59.0 | 60 | 110 | 8.0 |
| | 10 | Int. | ★ | 0700L090B | 89.0 | 90 | 140 | 8.0 |
| | 14 | Int. | ★ | 0700L120B | 119.0 | 120 | 170 | 8.0 |
| | 19 | Int. | ★ | 0700L150B | 149.0 | 150 | 200 | 8.0 |
| | 26 | Int. | ★ | 0700L200B | 199.0 | 200 | 250 | 8.0 |
| 7.1 | 2 | Int. | □ | 0710L030B | 29.5 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0710L060B | 59.5 | 60 | 110 | 8.0 |
| | 10 | Int. | □ | 0710L090B | 89.5 | 90 | 140 | 8.0 |
| | 14 | Int. | □ | 0710L120B | 119.5 | 120 | 170 | 8.0 |
| | 19 | Int. | □ | 0710L150B | 149.5 | 150 | 200 | 8.0 |
| | 26 | Int. | □ | 0710L200B | 199.5 | 200 | 250 | 8.0 |
| 7.2 | 2 | Int. | □ | 0720L030B | 29.5 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0720L060B | 59.5 | 60 | 110 | 8.0 |
| | 10 | Int. | □ | 0720L090B | 89.5 | 90 | 140 | 8.0 |
| | 14 | Int. | □ | 0720L120B | 119.5 | 120 | 170 | 8.0 |
| | 18 | Int. | □ | 0720L150B | 149.5 | 150 | 200 | 8.0 |
| | 25 | Int. | □ | 0720L200B | 199.5 | 200 | 250 | 8.0 |
| 7.3 | 2 | Int. | □ | 0730L030B | 29.5 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0730L060B | 59.5 | 60 | 110 | 8.0 |
| | 10 | Int. | □ | 0730L090B | 89.5 | 90 | 140 | 8.0 |
| | 14 | Int. | □ | 0730L120B | 119.5 | 120 | 170 | 8.0 |
| | 18 | Int. | □ | 0730L150B | 149.5 | 150 | 200 | 8.0 |
| | 25 | Int. | □ | 0730L200B | 199.5 | 200 | 250 | 8.0 |
| 7.4 | 1 | Int. | □ | 0740L030B | 29.5 | 30 | 80 | 8.0 |
| | 6 | Int. | □ | 0740L060B | 59.5 | 60 | 110 | 8.0 |
| | 10 | Int. | □ | 0740L090B | 89.5 | 90 | 140 | 8.0 |
| | 14 | Int. | □ | 0740L120B | 119.5 | 120 | 170 | 8.0 |
| | 18 | Int. | □ | 0740L150B | 149.5 | 150 | 200 | 8.0 |
| | 24 | Int. | □ | 0740L200B | 199.5 | 200 | 250 | 8.0 |
| 7.5 | 1 | Int. | ★ | 0750L030B | 29.5 | 30 | 80 | 8.0 |
| | 5 | Int. | ★ | 0750L060B | 59.5 | 60 | 110 | 8.0 |
| | 9 | Int. | ★ | 0750L090B | 89.5 | 90 | 140 | 8.0 |
| | 13 | Int. | ★ | 0750L120B | 119.5 | 120 | 170 | 8.0 |
| | 17 | Int. | ★ | 0750L150B | 149.5 | 150 | 200 | 8.0 |
| | 24 | Int. | ★ | 0750L200B | 199.5 | 200 | 250 | 8.0 |
| 7.6 | 1 | Int. | □ | 0760L030B | 30.0 | 30 | 80 | 8.0 |
| | 5 | Int. | □ | 0760L060B | 60.0 | 60 | 110 | 8.0 |
| | 9 | Int. | □ | 0760L090B | 90.0 | 90 | 140 | 8.0 |
| | 13 | Int. | □ | 0760L120B | 120.0 | 120 | 170 | 8.0 |
| | 17 | Int. | □ | 0760L150B | 150.0 | 150 | 200 | 8.0 |
| | 24 | Int. | □ | 0760L200B | 200.0 | 200 | 250 | 8.0 |
| 7.7 | 1 | Int. | □ | 0770L030B | 30.0 | 30 | 80 | 8.0 |
| | 5 | Int. | □ | 0770L060B | 60.0 | 60 | 110 | 8.0 |
| | 9 | Int. | □ | 0770L090B | 90.0 | 90 | 140 | 8.0 |
| | 13 | Int. | □ | 0770L120B | 120.0 | 120 | 170 | 8.0 |
| | 17 | Int. | □ | 0770L150B | 150.0 | 150 | 200 | 8.0 |
| | 23 | Int. | □ | 0770L200B | 200.0 | 200 | 250 | 8.0 |
| 7.8 | 1 | Int. | □ | 0780L030B | 30.0 | 30 | 80 | 8.0 |
| | 5 | Int. | □ | 0780L060B | 60.0 | 60 | 110 | 8.0 |
| | 9 | Int. | □ | 0780L090B | 90.0 | 90 | 140 | 8.0 |
| | 13 | Int. | □ | 0780L120B | 120.0 | 120 | 170 | 8.0 |
| | 17 | Int. | □ | 0780L150B | 150.0 | 150 | 200 | 8.0 |
| | 23 | Int. | □ | 0780L200B | 200.0 | 200 | 250 | 8.0 |
| 7.9 | 1 | Int. | □ | 0790L030B | 30.0 | 30 | 80 | 8.0 |
| | 5 | Int. | □ | 0790L060B | 60.0 | 60 | 110 | 8.0 |
| | 9 | Int. | □ | 0790L090B | 90.0 | 90 | 140 | 8.0 |
| | 13 | Int. | □ | 0790L120B | 120.0 | 120 | 170 | 8.0 |
| | 16 | Int. | □ | 0790L150B | 150.0 | 150 | 200 | 8.0 |
| | 23 | Int. | □ | 0790L200B | 200.0 | 200 | 250 | 8.0 |
| 29 | Int. | □ | 0790L250B | 250.0 | 250 | 300 | 8.0 | |

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|------|-----|------|------|
| | | | | | L3 | L2 | L1 | D4 | |
| 8.0 | 1 | Int. | ★ | MHS0800L030B | 30.0 | 30 | 80 | 8.0 | |
| | 5 | Int. | ★ | 0800L060B | 60.0 | 60 | 110 | 8.0 | |
| | 9 | Int. | ★ | 0800L090B | 90.0 | 90 | 140 | 8.0 | |
| | 12 | Int. | ★ | 0800L120B | 120.0 | 120 | 170 | 8.0 | |
| | 16 | Int. | ★ | 0800L150B | 150.0 | 150 | 200 | 8.0 | |
| | 22 | Int. | ★ | 0800L200B | 200.0 | 200 | 250 | 8.0 | |
| | 29 | Int. | ★ | 0800L250B | 250.0 | 250 | 300 | 8.0 | |
| | 8.1 | 2 | Int. | □ | 0810L040B | 38.5 | 40 | 100 | 10.0 |
| 8 | | Int. | □ | 0810L090B | 88.5 | 90 | 150 | 10.0 | |
| 12 | | Int. | □ | 0810L120B | 118.5 | 120 | 180 | 10.0 | |
| 16 | | Int. | □ | 0810L150B | 148.5 | 150 | 210 | 10.0 | |
| 22 | | Int. | □ | 0810L200B | 198.5 | 200 | 260 | 10.0 | |
| 28 | | Int. | □ | 0810L250B | 248.5 | 250 | 310 | 10.0 | |
| 8.2 | | 2 | Int. | □ | 0820L040B | 38.5 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0820L090B | 88.5 | 90 | 150 | 10.0 |
| | 12 | Int. | □ | 0820L120B | 118.5 | 120 | 180 | 10.0 | |
| | 16 | Int. | □ | 0820L150B | 148.5 | 150 | 210 | 10.0 | |
| | 22 | Int. | □ | 0820L200B | 198.5 | 200 | 260 | 10.0 | |
| | 28 | Int. | □ | 0820L250B | 248.5 | 250 | 310 | 10.0 | |
| | 8.3 | 2 | Int. | □ | 0830L040B | 38.5 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0830L090B | 88.5 | 90 | 150 | 10.0 |
| 12 | | Int. | □ | 0830L120B | 118.5 | 120 | 180 | 10.0 | |
| 15 | | Int. | □ | 0830L150B | 148.5 | 150 | 210 | 10.0 | |
| 21 | | Int. | □ | 0830L200B | 198.5 | 200 | 260 | 10.0 | |
| 27 | | Int. | □ | 0830L250B | 248.5 | 250 | 310 | 10.0 | |
| 8.4 | | 2 | Int. | □ | 0840L040B | 38.5 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0840L090B | 88.5 | 90 | 150 | 10.0 |
| | 12 | Int. | □ | 0840L120B | 118.5 | 120 | 180 | 10.0 | |
| | 15 | Int. | □ | 0840L150B | 148.5 | 150 | 210 | 10.0 | |
| | 21 | Int. | □ | 0840L200B | 198.5 | 200 | 260 | 10.0 | |
| | 27 | Int. | □ | 0840L250B | 248.5 | 250 | 310 | 10.0 | |
| | 8.5 | 2 | Int. | ★ | 0850L040B | 38.5 | 40 | 100 | 10.0 |
| | | 8 | Int. | ★ | 0850L090B | 88.5 | 90 | 150 | 10.0 |
| 11 | | Int. | ★ | 0850L120B | 118.5 | 120 | 180 | 10.0 | |
| 15 | | Int. | ★ | 0850L150B | 148.5 | 150 | 210 | 10.0 | |
| 21 | | Int. | ★ | 0850L200B | 198.5 | 200 | 260 | 10.0 | |
| 27 | | Int. | ★ | 0850L250B | 248.5 | 250 | 310 | 10.0 | |
| 8.6 | | 2 | Int. | □ | 0860L040B | 39.0 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0860L090B | 89.0 | 90 | 150 | 10.0 |
| | 11 | Int. | □ | 0860L120B | 119.0 | 120 | 180 | 10.0 | |
| | 15 | Int. | □ | 0860L150B | 149.0 | 150 | 210 | 10.0 | |
| | 21 | Int. | □ | 0860L200B | 199.0 | 200 | 260 | 10.0 | |
| | 26 | Int. | □ | 0860L250B | 249.0 | 250 | 310 | 10.0 | |
| | 8.7 | 2 | Int. | □ | 0870L040B | 39.0 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0870L090B | 89.0 | 90 | 150 | 10.0 |
| 11 | | Int. | □ | 0870L120B | 119.0 | 120 | 180 | 10.0 | |
| 15 | | Int. | □ | 0870L150B | 149.0 | 150 | 210 | 10.0 | |
| 20 | | Int. | □ | 0870L200B | 199.0 | 200 | 260 | 10.0 | |
| 26 | | Int. | □ | 0870L250B | 249.0 | 250 | 310 | 10.0 | |
| 8.8 | | 2 | Int. | □ | 0880L040B | 39.0 | 40 | 100 | 10.0 |
| | | 8 | Int. | □ | 0880L090B | 89.0 | 90 | 150 | 10.0 |
| | 11 | Int. | □ | 0880L120B | 119.0 | 120 | 180 | 10.0 | |
| | 14 | Int. | □ | 0880L150B | 149.0 | 150 | 210 | 10.0 | |
| | 20 | Int. | □ | 0880L200B | 199.0 | 200 | 260 | 10.0 | |
| | 26 | Int. | □ | 0880L250B | 249.0 | 250 | 310 | 10.0 | |
| | 8.9 | 2 | Int. | □ | 0890L040B | 39.0 | 40 | 100 | 10.0 |
| | | 7 | Int. | □ | 0890L090B | 89.0 | 90 | 150 | 10.0 |
| 11 | | Int. | □ | 0890L120B | 119.0 | 120 | 180 | 10.0 | |
| 14 | | Int. | □ | 0890L150B | 149.0 | 150 | 210 | 10.0 | |
| 20 | | Int. | □ | 0890L200B | 199.0 | 200 | 260 | 10.0 | |
| 25 | | Int. | □ | 0890L250B | 249.0 | 250 | 310 | 10.0 | |
| 9.0 | | 2 | Int. | ★ | 0900L040B | 39.0 | 40 | 100 | 10.0 |
| | | 7 | Int. | ★ | 0900L090B | 89.0 | 90 | 150 | 10.0 |
| | 11 | Int. | ★ | 0900L120B | 119.0 | 120 | 180 | 10.0 | |
| | 14 | Int. | ★ | 0900L150B | 149.0 | 150 | 210 | 10.0 | |
| | 20 | Int. | ★ | 0900L200B | 199.0 | 200 | 260 | 10.0 | |
| | 25 | Int. | ★ | 0900L250B | 249.0 | 250 | 310 | 10.0 | |

Solid Carbide Drill for Die & Mould Machining

MHS Drills



| D1 | 3.0≤D1≤6.0 | 6.0<D1≤10.0 | 10.0<D1≤12.0 |
|----------------|------------------|------------------|------------------|
| Tolerance (mm) | +0.010 -0.002 | +0.010 -0.005 | +0.010 -0.008 |

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 | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|------|------|
| | | | | | L3 | L2 | L1 | D4 |
| 9.1 | 2 | Int. | □ | MHS0910L040B | 39.5 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0910L090B | 89.5 | 90 | 150 | 10.0 |
| | 11 | Int. | □ | 0910L120B | 119.5 | 120 | 180 | 10.0 |
| | 14 | Int. | □ | 0910L150B | 149.5 | 150 | 210 | 10.0 |
| | 19 | Int. | □ | 0910L200B | 199.5 | 200 | 260 | 10.0 |
| | 25 | Int. | □ | 0910L250B | 249.5 | 250 | 310 | 10.0 |
| 30 | Int. | □ | 0910L300B | 299.5 | 300 | 360 | 10.0 | |
| 9.2 | 2 | Int. | □ | 0920L040B | 39.5 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0920L090B | 89.5 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0920L120B | 119.5 | 120 | 180 | 10.0 |
| | 14 | Int. | □ | 0920L150B | 149.5 | 150 | 210 | 10.0 |
| | 19 | Int. | □ | 0920L200B | 199.5 | 200 | 260 | 10.0 |
| | 25 | Int. | □ | 0920L250B | 249.5 | 250 | 310 | 10.0 |
| 30 | Int. | □ | 0920L300B | 299.5 | 300 | 360 | 10.0 | |
| 9.3 | 2 | Int. | □ | 0930L040B | 39.5 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0930L090B | 89.5 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0930L120B | 119.5 | 120 | 180 | 10.0 |
| | 14 | Int. | □ | 0930L150B | 149.5 | 150 | 210 | 10.0 |
| | 19 | Int. | □ | 0930L200B | 199.5 | 200 | 260 | 10.0 |
| | 24 | Int. | □ | 0930L250B | 249.5 | 250 | 310 | 10.0 |
| 30 | Int. | □ | 0930L300B | 299.5 | 300 | 360 | 10.0 | |
| 9.4 | 2 | Int. | □ | 0940L040B | 39.5 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0940L090B | 89.5 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0940L120B | 119.5 | 120 | 180 | 10.0 |
| | 13 | Int. | □ | 0940L150B | 149.5 | 150 | 210 | 10.0 |
| | 19 | Int. | □ | 0940L200B | 199.5 | 200 | 260 | 10.0 |
| | 24 | Int. | □ | 0940L250B | 249.5 | 250 | 310 | 10.0 |
| 29 | Int. | □ | 0940L300B | 299.5 | 300 | 360 | 10.0 | |
| 9.5 | 2 | Int. | ★ | 0950L040B | 39.5 | 40 | 100 | 10.0 |
| | 7 | Int. | ★ | 0950L090B | 89.5 | 90 | 150 | 10.0 |
| | 10 | Int. | ★ | 0950L120B | 119.5 | 120 | 180 | 10.0 |
| | 13 | Int. | ★ | 0950L150B | 149.5 | 150 | 210 | 10.0 |
| | 18 | Int. | ★ | 0950L200B | 199.5 | 200 | 260 | 10.0 |
| | 24 | Int. | ★ | 0950L250B | 249.5 | 250 | 310 | 10.0 |
| 29 | Int. | ★ | 0950L300B | 299.5 | 300 | 360 | 10.0 | |
| 9.6 | 2 | Int. | □ | 0960L040B | 40.0 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0960L090B | 90.0 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0960L120B | 120.0 | 120 | 180 | 10.0 |
| | 13 | Int. | □ | 0960L150B | 150.0 | 150 | 210 | 10.0 |
| | 18 | Int. | □ | 0960L200B | 200.0 | 200 | 260 | 10.0 |
| | 24 | Int. | □ | 0960L250B | 250.0 | 250 | 310 | 10.0 |
| 29 | Int. | □ | 0960L300B | 300.0 | 300 | 360 | 10.0 | |
| 9.7 | 2 | Int. | □ | 0970L040B | 40.0 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0970L090B | 90.0 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0970L120B | 120.0 | 120 | 180 | 10.0 |
| | 13 | Int. | □ | 0970L150B | 150.0 | 150 | 210 | 10.0 |
| | 18 | Int. | □ | 0970L200B | 200.0 | 200 | 260 | 10.0 |
| | 23 | Int. | □ | 0970L250B | 250.0 | 250 | 310 | 10.0 |
| 28 | Int. | □ | 0970L300B | 300.0 | 300 | 360 | 10.0 | |

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|------|------|
| | | | | | L3 | L2 | L1 | D4 |
| 9.8 | 2 | Int. | □ | MHS0980L040B | 40.0 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0980L090B | 90.0 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0980L120B | 120.0 | 120 | 180 | 10.0 |
| | 13 | Int. | □ | 0980L150B | 150.0 | 150 | 210 | 10.0 |
| | 18 | Int. | □ | 0980L200B | 200.0 | 200 | 260 | 10.0 |
| | 23 | Int. | □ | 0980L250B | 250.0 | 250 | 310 | 10.0 |
| 28 | Int. | □ | 0980L300B | 300.0 | 300 | 360 | 10.0 | |
| 9.9 | 2 | Int. | □ | 0990L040B | 40.0 | 40 | 100 | 10.0 |
| | 7 | Int. | □ | 0990L090B | 90.0 | 90 | 150 | 10.0 |
| | 10 | Int. | □ | 0990L120B | 120.0 | 120 | 180 | 10.0 |
| | 13 | Int. | □ | 0990L150B | 150.0 | 150 | 210 | 10.0 |
| | 18 | Int. | □ | 0990L200B | 200.0 | 200 | 260 | 10.0 |
| | 23 | Int. | □ | 0990L250B | 250.0 | 250 | 310 | 10.0 |
| 28 | Int. | □ | 0990L300B | 300.0 | 300 | 360 | 10.0 | |
| 10.0 | 1 | Int. | ★ | 1000L040B | 40.0 | 40 | 100 | 10.0 |
| | 6 | Int. | ★ | 1000L090B | 90.0 | 90 | 150 | 10.0 |
| | 9 | Int. | ★ | 1000L120B | 120.0 | 120 | 180 | 10.0 |
| | 12 | Int. | ★ | 1000L150B | 150.0 | 150 | 210 | 10.0 |
| | 17 | Int. | ★ | 1000L200B | 200.0 | 200 | 260 | 10.0 |
| | 22 | Int. | ★ | 1000L250B | 250.0 | 250 | 310 | 10.0 |
| 27 | Int. | ★ | 1000L300B | 300.0 | 300 | 360 | 10.0 | |
| 10.1 | 1 | Int. | □ | 1010L040B | 38.5 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1010L090B | 88.5 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1010L120B | 118.5 | 120 | 180 | 12.0 |
| | 12 | Int. | □ | 1010L150B | 148.5 | 150 | 210 | 12.0 |
| | 17 | Int. | □ | 1010L200B | 198.5 | 200 | 260 | 12.0 |
| | 22 | Int. | □ | 1010L250B | 248.5 | 250 | 310 | 12.0 |
| 27 | Int. | □ | 1010L300B | 298.5 | 300 | 360 | 12.0 | |
| 10.2 | 1 | Int. | □ | 1020L040B | 38.5 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1020L090B | 88.5 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1020L120B | 118.5 | 120 | 180 | 12.0 |
| | 12 | Int. | □ | 1020L150B | 148.5 | 150 | 210 | 12.0 |
| | 17 | Int. | □ | 1020L200B | 198.5 | 200 | 260 | 12.0 |
| | 22 | Int. | □ | 1020L250B | 248.5 | 250 | 310 | 12.0 |
| 27 | Int. | □ | 1020L300B | 298.5 | 300 | 360 | 12.0 | |
| 10.3 | 1 | Int. | □ | 1030L040B | 38.5 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1030L090B | 88.5 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1030L120B | 118.5 | 120 | 180 | 12.0 |
| | 12 | Int. | □ | 1030L150B | 148.5 | 150 | 210 | 12.0 |
| | 17 | Int. | □ | 1030L200B | 198.5 | 200 | 260 | 12.0 |
| | 22 | Int. | □ | 1030L250B | 248.5 | 250 | 310 | 12.0 |
| 26 | Int. | □ | 1030L300B | 298.5 | 300 | 360 | 12.0 | |
| 10.4 | 1 | Int. | □ | 1040L040B | 38.5 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1040L090B | 88.5 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1040L120B | 118.5 | 120 | 180 | 12.0 |
| | 12 | Int. | □ | 1040L150B | 148.5 | 150 | 210 | 12.0 |
| | 17 | Int. | □ | 1040L200B | 198.5 | 200 | 260 | 12.0 |
| | 21 | Int. | □ | 1040L250B | 248.5 | 250 | 310 | 12.0 |
| 26 | Int. | □ | 1040L300B | 298.5 | 300 | 360 | 12.0 | |

Note) Please contact Mitsubishi Carbide for any geometry that is not in the brochure (e.g. different diameter and length).

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Dimensions (mm) | | | |
|--------------------------|---------------------|---------|-----------------|--------------|-----------------|-----|-----|------|
| | | | | | L3 | L2 | L1 | D4 |
| 10.5 | 1 | Int. | ★ | MHS1050L040B | 38.5 | 40 | 100 | 12.0 |
| | 6 | Int. | ★ | 1050L090B | 88.5 | 90 | 150 | 12.0 |
| | 9 | Int. | ★ | 1050L120B | 118.5 | 120 | 180 | 12.0 |
| | 12 | Int. | ★ | 1050L150B | 148.5 | 150 | 210 | 12.0 |
| | 16 | Int. | ★ | 1050L200B | 198.5 | 200 | 260 | 12.0 |
| | 21 | Int. | ★ | 1050L250B | 248.5 | 250 | 310 | 12.0 |
| | 26 | Int. | ★ | 1050L300B | 298.5 | 300 | 360 | 12.0 |
| 10.6 | 1 | Int. | □ | 1060L040B | 39.0 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1060L090B | 89.0 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1060L120B | 119.0 | 120 | 180 | 12.0 |
| | 12 | Int. | □ | 1060L150B | 149.0 | 150 | 210 | 12.0 |
| | 16 | Int. | □ | 1060L200B | 199.0 | 200 | 260 | 12.0 |
| | 21 | Int. | □ | 1060L250B | 249.0 | 250 | 310 | 12.0 |
| | 26 | Int. | □ | 1060L300B | 299.0 | 300 | 360 | 12.0 |
| 10.7 | 1 | Int. | □ | 1070L040B | 39.0 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1070L090B | 89.0 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1070L120B | 119.0 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1070L150B | 149.0 | 150 | 210 | 12.0 |
| | 16 | Int. | □ | 1070L200B | 199.0 | 200 | 260 | 12.0 |
| | 21 | Int. | □ | 1070L250B | 249.0 | 250 | 310 | 12.0 |
| | 25 | Int. | □ | 1070L300B | 299.0 | 300 | 360 | 12.0 |
| 10.8 | 1 | Int. | □ | 1080L040B | 39.0 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1080L090B | 89.0 | 90 | 150 | 12.0 |
| | 9 | Int. | □ | 1080L120B | 119.0 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1080L150B | 149.0 | 150 | 210 | 12.0 |
| | 16 | Int. | □ | 1080L200B | 199.0 | 200 | 260 | 12.0 |
| | 21 | Int. | □ | 1080L250B | 249.0 | 250 | 310 | 12.0 |
| | 25 | Int. | □ | 1080L300B | 299.0 | 300 | 360 | 12.0 |
| 10.9 | 1 | Int. | □ | 1090L040B | 39.0 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1090L090B | 89.0 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1090L120B | 119.0 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1090L150B | 149.0 | 150 | 210 | 12.0 |
| | 16 | Int. | □ | 1090L200B | 199.0 | 200 | 260 | 12.0 |
| | 20 | Int. | □ | 1090L250B | 249.0 | 250 | 310 | 12.0 |
| | 25 | Int. | □ | 1090L300B | 299.0 | 300 | 360 | 12.0 |
| 11.0 | 1 | Int. | ★ | 1100L040B | 39.0 | 40 | 100 | 12.0 |
| | 6 | Int. | ★ | 1100L090B | 89.0 | 90 | 150 | 12.0 |
| | 8 | Int. | ★ | 1100L120B | 119.0 | 120 | 180 | 12.0 |
| | 11 | Int. | ★ | 1100L150B | 149.0 | 150 | 210 | 12.0 |
| | 16 | Int. | ★ | 1100L200B | 199.0 | 200 | 260 | 12.0 |
| | 20 | Int. | ★ | 1100L250B | 249.0 | 250 | 310 | 12.0 |
| | 25 | Int. | ★ | 1100L300B | 299.0 | 300 | 360 | 12.0 |
| 11.1 | 1 | Int. | □ | 1110L040B | 39.5 | 40 | 100 | 12.0 |
| | 6 | Int. | □ | 1110L090B | 89.5 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1110L120B | 119.5 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1110L150B | 149.5 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1110L200B | 199.5 | 200 | 260 | 12.0 |
| | 20 | Int. | □ | 1110L250B | 249.5 | 250 | 310 | 12.0 |
| | 24 | Int. | □ | 1110L300B | 299.5 | 300 | 360 | 12.0 |
| 11.2 | 1 | Int. | □ | 1120L040B | 39.5 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1120L090B | 89.5 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1120L120B | 119.5 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1120L150B | 149.5 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1120L200B | 199.5 | 200 | 260 | 12.0 |
| | 20 | Int. | □ | 1120L250B | 249.5 | 250 | 310 | 12.0 |
| | 24 | Int. | □ | 1120L300B | 299.5 | 300 | 360 | 12.0 |

| Drill Dia. D1 (mm) | Hole Depth (l/d) | Coolant | Stock VP15TF | Order Number | Order Number | | | |
|--------------------------|---------------------|---------|-----------------|--------------|--------------|-----|-----|------|
| | | | | | L3 | L2 | L1 | D4 |
| 11.3 | 1 | Int. | □ | MHS1130L040B | 39.5 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1130L090B | 89.5 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1130L120B | 119.5 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1130L150B | 149.5 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1130L200B | 199.5 | 200 | 260 | 12.0 |
| | 20 | Int. | □ | 1130L250B | 249.5 | 250 | 310 | 12.0 |
| | 24 | Int. | □ | 1130L300B | 299.5 | 300 | 360 | 12.0 |
| 11.4 | 1 | Int. | □ | 1140L040B | 39.5 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1140L090B | 89.5 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1140L120B | 119.5 | 120 | 180 | 12.0 |
| | 11 | Int. | □ | 1140L150B | 149.5 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1140L200B | 199.5 | 200 | 260 | 12.0 |
| | 19 | Int. | □ | 1140L250B | 249.5 | 250 | 310 | 12.0 |
| | 24 | Int. | □ | 1140L300B | 299.5 | 300 | 360 | 12.0 |
| 11.5 | 1 | Int. | ★ | 1150L040B | 39.5 | 40 | 100 | 12.0 |
| | 5 | Int. | ★ | 1150L090B | 89.5 | 90 | 150 | 12.0 |
| | 8 | Int. | ★ | 1150L120B | 119.5 | 120 | 180 | 12.0 |
| | 10 | Int. | ★ | 1150L150B | 149.5 | 150 | 210 | 12.0 |
| | 15 | Int. | ★ | 1150L200B | 199.5 | 200 | 260 | 12.0 |
| | 19 | Int. | ★ | 1150L250B | 249.5 | 250 | 310 | 12.0 |
| | 24 | Int. | ★ | 1150L300B | 299.5 | 300 | 360 | 12.0 |
| 11.6 | 1 | Int. | □ | 1160L040B | 40.0 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1160L090B | 90.0 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1160L120B | 120.0 | 120 | 180 | 12.0 |
| | 10 | Int. | □ | 1160L150B | 150.0 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1160L200B | 200.0 | 200 | 260 | 12.0 |
| | 19 | Int. | □ | 1160L250B | 250.0 | 250 | 310 | 12.0 |
| | 23 | Int. | □ | 1160L300B | 300.0 | 300 | 360 | 12.0 |
| 11.7 | 1 | Int. | □ | 1170L040B | 40.0 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1170L090B | 90.0 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1170L120B | 120.0 | 120 | 180 | 12.0 |
| | 10 | Int. | □ | 1170L150B | 150.0 | 150 | 210 | 12.0 |
| | 15 | Int. | □ | 1170L200B | 200.0 | 200 | 260 | 12.0 |
| | 19 | Int. | □ | 1170L250B | 250.0 | 250 | 310 | 12.0 |
| | 23 | Int. | □ | 1170L300B | 300.0 | 300 | 360 | 12.0 |
| 11.8 | 1 | Int. | □ | 1180L040B | 40.0 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1180L090B | 90.0 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1180L120B | 120.0 | 120 | 180 | 12.0 |
| | 10 | Int. | □ | 1180L150B | 150.0 | 150 | 210 | 12.0 |
| | 14 | Int. | □ | 1180L200B | 200.0 | 200 | 260 | 12.0 |
| | 19 | Int. | □ | 1180L250B | 250.0 | 250 | 310 | 12.0 |
| | 23 | Int. | □ | 1180L300B | 300.0 | 300 | 360 | 12.0 |
| 11.9 | 1 | Int. | □ | 1190L040B | 40.0 | 40 | 100 | 12.0 |
| | 5 | Int. | □ | 1190L090B | 90.0 | 90 | 150 | 12.0 |
| | 8 | Int. | □ | 1190L120B | 120.0 | 120 | 180 | 12.0 |
| | 10 | Int. | □ | 1190L150B | 150.0 | 150 | 210 | 12.0 |
| | 14 | Int. | □ | 1190L200B | 200.0 | 200 | 260 | 12.0 |
| | 19 | Int. | □ | 1190L250B | 250.0 | 250 | 310 | 12.0 |
| | 23 | Int. | □ | 1190L300B | 300.0 | 300 | 360 | 12.0 |
| 12.0 | 1 | Int. | ★ | 1200L040B | 40.0 | 40 | 100 | 12.0 |
| | 5 | Int. | ★ | 1200L090B | 90.0 | 90 | 150 | 12.0 |
| | 7 | Int. | ★ | 1200L120B | 120.0 | 120 | 180 | 12.0 |
| | 10 | Int. | ★ | 1200L150B | 150.0 | 150 | 210 | 12.0 |
| | 14 | Int. | ★ | 1200L200B | 200.0 | 200 | 260 | 12.0 |
| | 18 | Int. | ★ | 1200L250B | 250.0 | 250 | 310 | 12.0 |
| | 22 | Int. | ★ | 1200L300B | 300.0 | 300 | 360 | 12.0 |

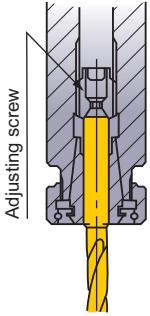
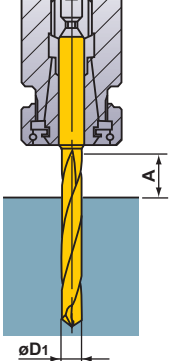
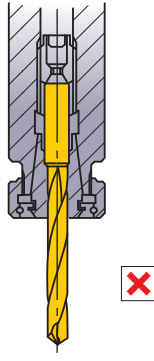
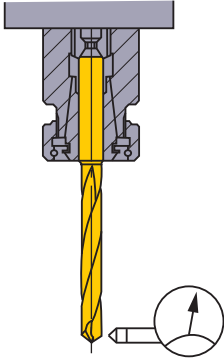
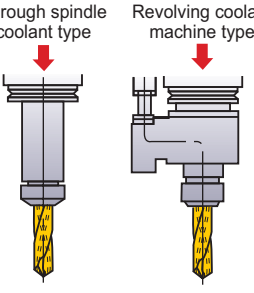
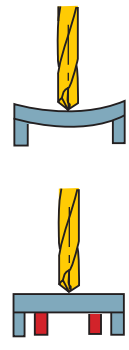
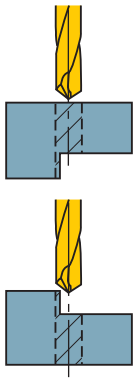
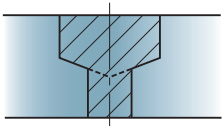
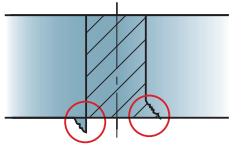
Recommended Cutting Conditions

| Work Material | Drill Diameter | φ3.0—φ6.0 | | φ6.0—φ10.0 | | φ10.0—φ12.0 | |
|---|----------------|------------------------|--------------------------|------------------|--------------------------|------------------|--------------------------|
| | | Conditions Hardness | Cutting Speed (m/min) | Feed (mm/rev) | Cutting Speed (m/min) | Feed (mm/rev) | Cutting Speed (m/min) |
| H Heat-treated steel Pre-hardened steel | —40HRC | 40—70 | 0.10—0.20 | 40—70 | 0.15—0.25 | 40—70 | 0.20—0.30 |
| | 40—50HRC | 20—50 | 0.05—0.15 | 20—50 | 0.10—0.20 | 20—50 | 0.15—0.25 |
| | 50—55HRC | 10—30 | 0.03—0.10 | 10—30 | 0.05—0.15 | 10—30 | 0.05—0.20 |

Note 1) When using a 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 Drill

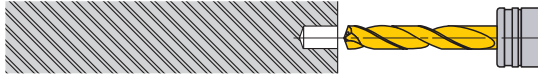
| | | | |
|---|--|--|--|
| <p>Drill holding</p>  <p>Adjusting screw</p> <p>Thrust bearing type collet chuck holds the drill securely.</p> | <p>Drill holding</p>  <p>$A : \geq D_1 \times 1.5$</p> | <p>Drill installation</p>  <p>Do not clamp on the flutes.</p> | <p>Installation tolerance</p>  <p>Runout $\leq 0.03\text{mm}$</p> |
| <p>Coolant method (MHS)</p>  <p>Through spindle coolant type Revolving coolant machine type</p> <p>Coolant pressure is approx. 0.5 - 7MPa.</p> | <p>Coolant handling</p> <p>< MHS type ></p> <ol style="list-style-type: none"> 1) Dirt and dust particles in old coolant can clog the oil hole and prevent effective flow. Regular coolant exchange is recommended. 2) Small particles of swarf will jam in the oil hole. Use a filter as a preventative measure. When using small diameter drills, use a fine mesh filter. | <p>Thin workpieces</p>  <p>If bending occurs</p> <p>Support the workpiece</p> | <p>Interrupted cutting</p>  <p>One process</p> <p>① Lower the feed when drilling the interrupted part.</p> <p>Requires prior machining</p> <p>① Spot face with an end mill prior to drilling.</p> |
| <p>Stepped holes</p>  <ol style="list-style-type: none"> ① Divide the machining into two processes. ② Drill the larger hole first. <p>*Tools for chamfering and spot facing can be produced to order.</p> | <p>Burring and workpiece chipping</p>  <ol style="list-style-type: none"> ① Lower the feed rate when breaking through. ② Change the point angle. | | |

Operational Guidance for the MHS long type Drill ($L/D \geq 10$)

Flat Face Drilling

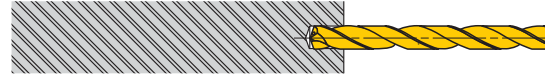
● Drilling a blind hole

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 or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

2. Initial cutting with the long type drill



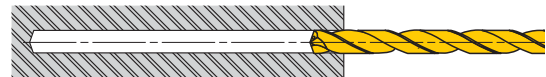
- ① Penetrate the pilot hole at low revolution. (Cutting speed 20m-30m/min, feed rate 0.2mm-0.3mm/rev)
- ② Stop the long type drill 1mm-3mm short of the pilot hole bottom.

3. Drill the deep hole



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

4. Drill retraction

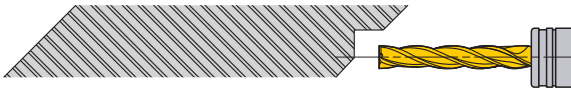


- ① After drilling, lower the cutting revolution about 1mm-2mm short of the hole end. (Cutting speed of around 20m-30m/min)
- ② Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
- ③ Finally, clear the hole at a cutting speed of 20m-30m/min and feed rate of 0.2mm-0.3mm/rev.

Interrupted Drilling

● Drilling and breaking through on irregular faces or angles

1. Spot facing



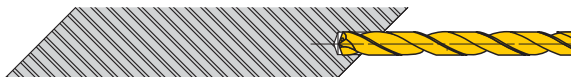
- ① Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



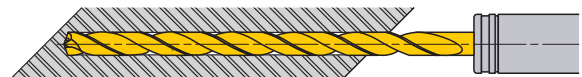
- ① Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
- ② Ensure a high precision hole is drilled for the guide.
- ③ Drill depth : Approx 1D or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

3. Initial cutting with the long type drill



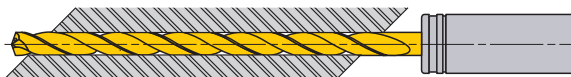
- ① Penetrate the pilot hole at a low revolution. (Cutting speed 20m-30m/min, feed rate 0.2mm-0.3mm/rev)
- ② Stop the long type drill 1mm-3mm short of the pilot hole bottom.

4. Drill the deep hole



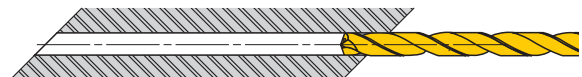
- ① Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



- ① When breaking through, the cutting edge can be damaged.
- ② A feed rate of 0.03mm-0.1mm/rev is recommended.

6. Drill retraction



- ① Retract the drill to the pilot hole depth starting point at a feed rate of 3000mm/min.
- ② Finally clear the hole at a cutting speed of 20m-30m/min and feed rate of 0.2mm-0.3mm/rev.



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