MITSUBISHI
MITSUBISHI MATERIALS

TOOLS NEWS

B123G

Solid Carbide Drill

MHE Drill for Wheel Hubs

Unique design provides superior hole accuracy for shallow hole drilling.

Effective drilling of hub bolt holes can be achieved.

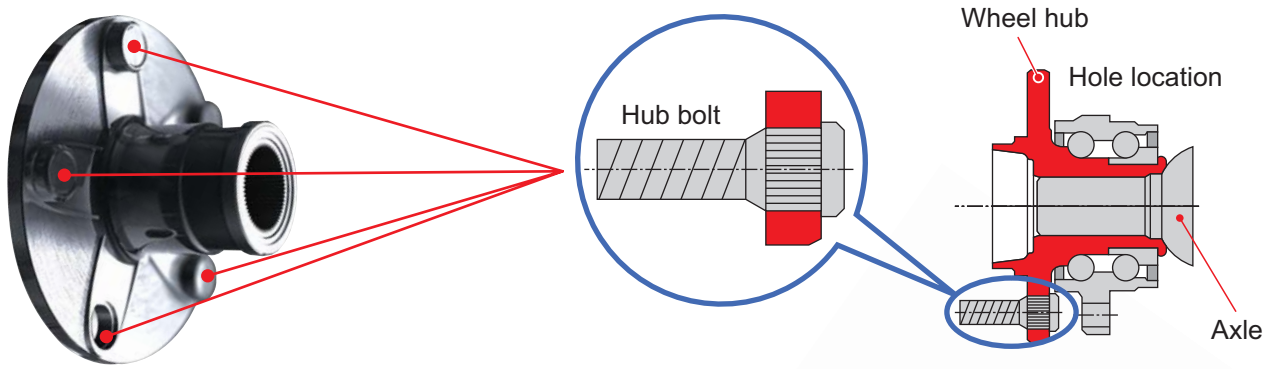
Solid Carbide Drill
MHE Drill for Wheel Hubs

Outline

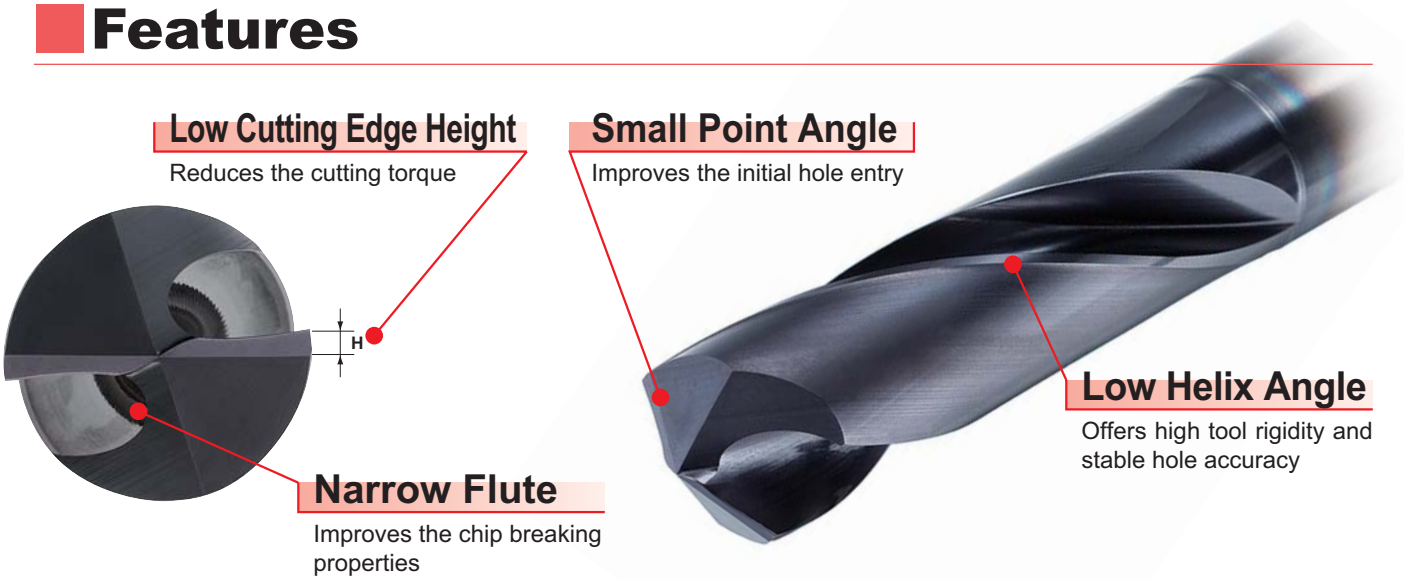
For machining of the bolt holes of hubs, general-purpose drills are widely used. However, these are not highly productive due to the following problems.

- Chips elongate and damage the periphery of drilled holes and lead to poor surface finishes.
- Plastic deformation can occur leading to a work hardened layer generating in the wall of the hole. This can result in a poor press fitting of the hub bolts.
- Due to poor surface finish, a reaming operation maybe required to finish the holes.

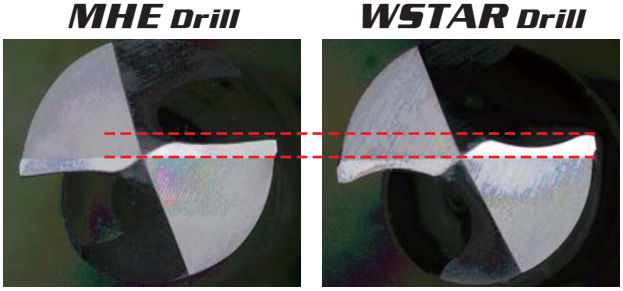
The MHE solid carbide drill overcomes the above problems as it exhibits excellent chip control and offers efficient, high precision drilling due to the use of low resistance cutting edges and low helix angle.



Features

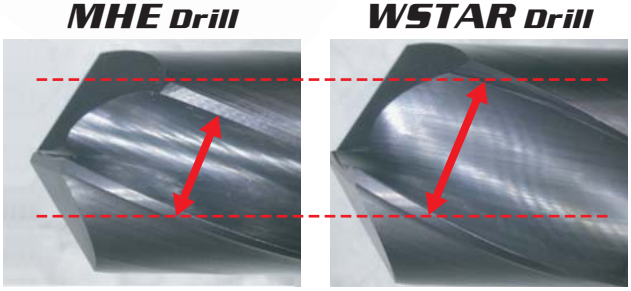


Low Cutting Edge Height



Reduces cutting torque

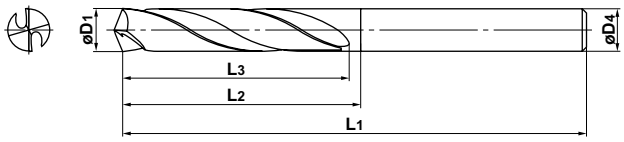
Narrow Flute



Finely breaks up chips

MHE Drill for Wheel Hubs

Straight Type



Dimensions

Drill Dia. D1 (mm)	Stock VP15TF		Dimensions (mm) L3	L1	L2
10.0—10.2	◇		43	87	43
10.2—10.5	◇		43	87	43
10.5—10.7	◇		43	87	43
10.7—11.0	◇		47	93	47
11.0—11.2	◇		47	93	47
11.2—11.5	◇		47	93	47
11.5—11.9	◇		47	93	47
11.9—12.0	◇		51	100	51
12.0—12.5	◇		51	100	51
12.5—13.0	◇		51	100	51

Drill Dia. D1 (mm)	Stock VP15TF		Dimensions (mm) L3	L1	L2
13.0—13.5	◇		54	104	54
13.5—14.0	◇		54	104	54
14.0—14.2	◇		56	104	56
14.2—14.5	◇		56	108	56
14.5—15.0	◇		56	108	56
15.0—15.5	◇		58	112	58
15.5—16.0	◇		58	112	58
16.0—16.5	◇		60	116	60
16.5—17.0	◇		60	116	60
17.0—17.5	◇		62	119	62
17.5—18.0	◇		62	119	62

◇ Made to order product.

Product Range

Drill dia. : ø10−ø18mm
Drilling depth: L/D≤1 (L: hole depth; D: drill dia.)
Dimensions : Flute length is less than 4 times the drill diameter; Shank length will be determined based on present standards.
Tool grade : VP15TF
Note) Contact Mitsubishi Materials for any geometry that is not shown above (e.g. different diameters and flute lengths can be made to order).

Order Number

When placing an order clearly indicate the following information.

Drill dia. (**D1**), Overall length (**L1**), Shank dia. (**D4**)

Ex)

M H E 1300 x 104 x 13

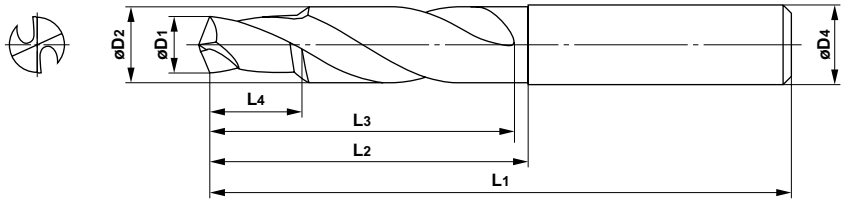
1300	104	13
Drill dia. 13.00mm	Overall length 104mm	Shank dia. 13.0mm

- The flute length will be determined by Mitsubishi Materials.
- Specify the hole diameter (including the hole tolerance) when placing an order.

Notes When Regrinding and Recoating the Drill

- When carrying out regrinding, it is necessary to recoat the drill to maintain tool life.
- When requesting regrinding and recoating of the drill, contact Mitsubishi Materials sales staff.

Step Type



Dimensions

Drill Dia. D1 (mm)	Stock		Dimensions (mm)					
	VP15TF		D2	L4	L3	L1	L2	D4
10	◇		16	15	50	100	50	16
11	◇		17	20	55	110	55	17
12	◇		18	20	55	110	55	18
13	◇		18	20	55	110	55	18
14	◇		18	20	55	110	55	18

◇ : Made to order product.

Chamfer Diameter Reference Range

■ : Applicable Range

Max. Chamfer Cutting Edge Dia. (mm)	Drill Dia. D1 (mm)	Chamfer Cutting Edge Dia. D2 (mm)								
		10	11	12	13	14	15	16	17	18
16	10		■	■	■	■	■	■		
17.6	11			■	■	■	■	■	■	
19.2	12				■	■	■	■	■	■
20	13					■	■	■	■	■
20	14						■	■	■	■
20	15							■	■	■
20	16								■	■
20	17									■

Step Length Range

■ : Applicable Range

Drill Dia. D1 (mm)	Step Length L4 (mm)				
	10	15	20	25	30
10	■	■			
11	■	■			
12	■	■			
13	■	■	■		
14	■	■	■		
15	■	■	■		
16	■	■	■		
17	■	■	■	■	

Flute Length Range

■ : Applicable Range

Drill Dia. D1 (mm)	Flute Length L3 (mm)				
	45	50	55	60	65
10	■	■			
11	■	■	■		
12	■	■	■		
13	■	■	■		
14	■	■	■		
15	■	■	■		
16	■	■	■	■	
17	■	■	■	■	

Order Number

When placing an order clearly indicate the following information.

Drill dia. (**D1**), Chamfer dia. (**D2**), Overall length (**L1**), Shank dia. (**D4**)

Ex)

MHE 1400 x 1800 x 110 x 18

Drill dia.	Chamfer dia.	Overall length	Shank dia.
14.00mm	18.00mm	110mm	18.0mm

- The flute length will be determined by Mitsubishi Materials.
- Specify the hole diameter (including the hole tolerance) when placing an order.

Notes 1. These products are made to order.
2. Specify the hole diameter (including the hole tolerance) when placing an order.

Product Range

Drill dia. **D1**: ø10−ø18mm

Chamfer dia. **D2**: D2/D1≤1.6 and up to ø18m

Overall length **L1**: To be determined based on the straight type drill. If the chamfer diameter is ø16mm, the maximum overall length is 112mm.

Shank dia. **D4**: Same as the chamfer diameter up to ø16. Increases in 0.5mm increments for the diameter larger than ø16.

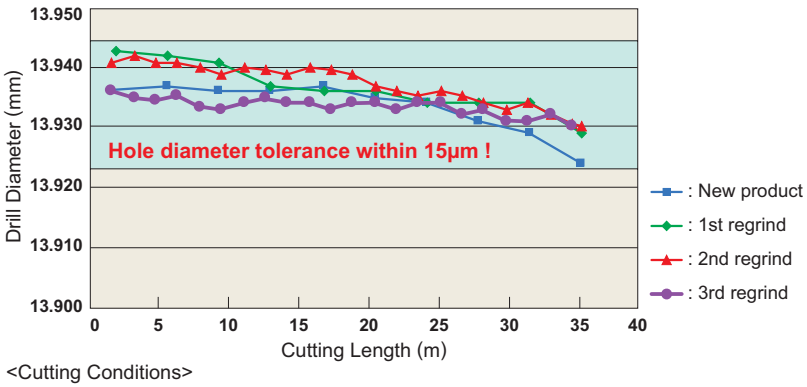
Tool grade : VP15TF

Notes When Regrinding and Recoating the Drill

- When carrying out regrinding, it is necessary to recoat the drill to maintain tool life.
- When requesting regrinding and recoating of the drill, contact Mitsubishi Materials sales staff.

Cutting Performance

Hole Accuracy



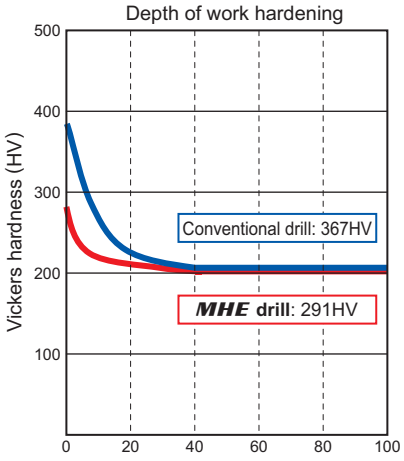
<Cutting Conditions>
Workpiece: JIS S53C Cutting speed: 60m/min Feed: 0.15mm/rev
Hole depth: 6mm Coolant: W.S.O.

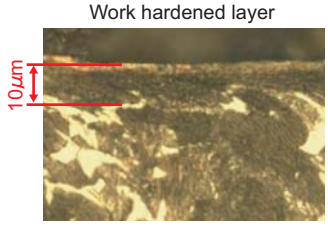
Chip Geometry

Chip breaking properties
The workpiece surface is not damaged due to the fine chips that were generated.

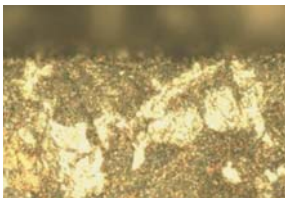
Result of Reducing the Cutting Torque

Prevents the generation of high cutting temperatures and the formation of the work hardened layer.





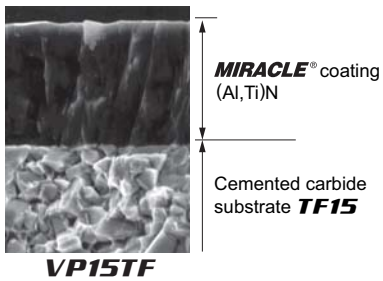
Conventional drill:
Work hardened layer generated.



MHE drill: No work hardened layer

Tough Drill Tool Grade

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

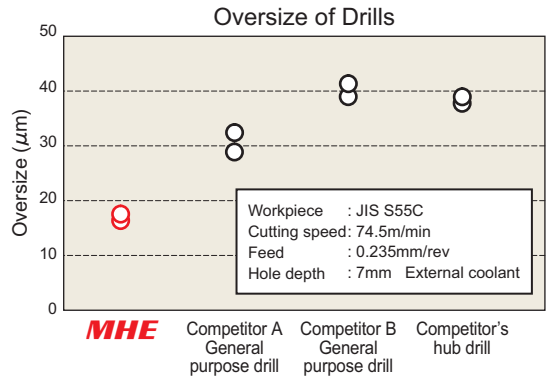


MIRACLE® Coated
Features of **VP15TF**

MIRACLE® coated **VP15TF** has a high welding resistance, making it suitable for machining a wide range of workpiece materials from mild steels and carbon steels, through to stainless steels and cast iron.

The ***MHE*** drill can prevent the formation of a work hardened layer (that usually cause tool damage), which makes it possible to produce high quality products.

Oversize Comparison



Recommended Cutting Conditions

Work Material		Hardness	ϕ10.0—ϕ18.0	
			Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel	180—280HB	75 (60—90)	0.25 (0.15—0.30)

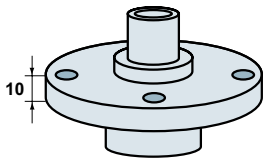
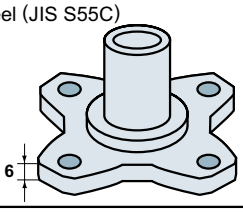
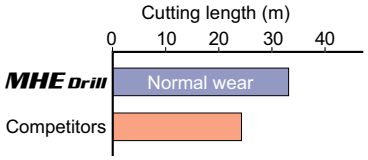
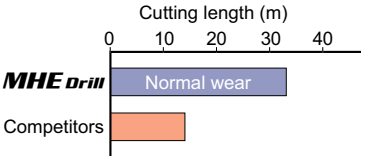
(Note) The above cutting conditions should be used as a guide and need to be adjusted according to the machine rigidity, workpiece clamping and shape.

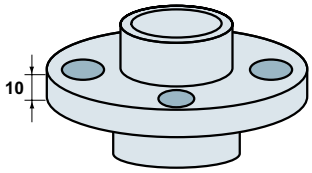
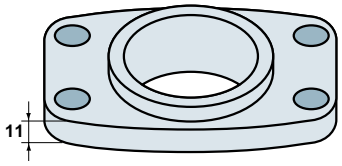
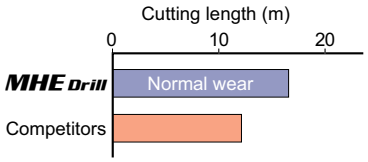
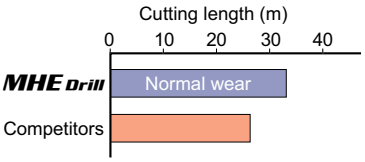
Due to reduced oversize, the ***MHE*** drill can produce holes without reaming.

Solid Carbide Drill

MHE Drill for Wheel Hubs

Application Examples

Tool	MHE 13.93 x 104 x 14	MHE 13.93 x 104 x 14
Workpiece	Carbon Steel (JIS S55C) 	Carbon Steel (JIS S55C) 
Component	Inner face of hub	Inner face of hub
Cutting Conditions: Cutting Speed (m/min)	80	60
Cutting Conditions: Feed (mm/rev)	0.3	0.15
Cutting Conditions: Revolution (min^{-1})	1,800	1,400
Coolant	W.S.O.	W.S.O.
Machine Type	Machining centre	Machining centre
Results		

Tool	MHE 16.10 x 110 x 16.1	MHE 10.8 x 93 x 10.8
Workpiece	Carbon Steel (JIS S55C) 	Carbon Steel (JIS S55C) 
Component	Inner face of hub	Outer face of hub
Cutting Conditions: Cutting Speed (m/min)	68	68
Cutting Conditions: Feed (mm/rev)	0.2	0.2
Cutting Conditions: Revolution (min^{-1})	1,350	2,000
Coolant	W.S.O.	W.S.O.
Machine Type	Machining centre	Machining centre
Results		

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.

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(Tools specifications subject to change without notice.)

2007.3.E(5B)