Drill dia.	Shank dia.	Overall length	Drill length	Workpiece end-face Hole size
Dc	Ds	L	ℓ	Dw

MHCDS

Center Drills for Carbon Steels of Medium Hardness for Running at High Speed

Specification

HSS-Co | Coating

Cutting Speed depending on Materials

Medium carbon steels 中炭素鋼	High carbon steels 高炭素鋼	Alloy steels 合金鋼	Thermal refined steels 調質鋼	Tool steels 工具鋼	Ductile cast irons 強靭鋳鉄
20~40 (m/min)	20~40 (m/min)	20~40 (m/min)	10~20 (m/min)	15~30 (m/min)	15~40 (m/min)
			25~35HRC		

Product Features

- In order to improve positioning accuracy of projection and shank tolerance, MHCDS has the cutting edge only on one end.
- Considering clearance between center point and bottom of center hole, cutting edge length (ℓ) is made as short as possible to increase toughness.
- To increase centrality, drill point has 3 rakes and X thinning design, which enables high speed cutting and feeding.
- Increased centrality leads to great improvement of surface finish and circularity of center-drilled hole.

Cutting Data

Great extension of tool life with MHCDS

Right pictures show difference of the damage on cutting edge between CD-S and MHCDS after 480 hole cuttings under same cutting condition (stated in right) MHCDS has smaller wear and edge damage. This tells we can continue to use MHCDS further.

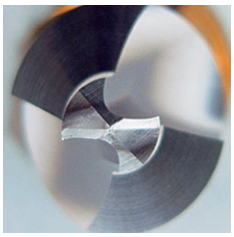
Cutting condition [3×60°×8]

Work material	S55C
Cutting speed	30m/min (1,200min^{-1})
Feed	0.15mm/rev
Machine	NC lathe
Cutting Fluid	Water soluble cutting fluid

<After drilling 480 holes> **Large wear**

CD-S

<After drilling 480 holes> **Small wear**

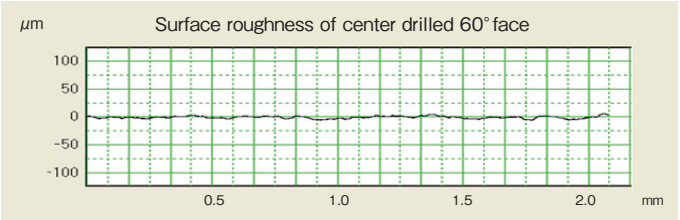


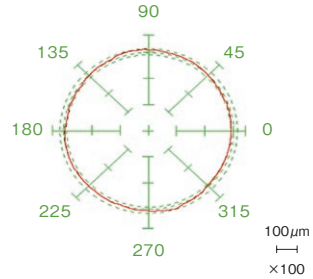
MHCDS

Great improvement in surface roughness and circularity with MHCDS

Under the cutting condition stated above, the surface finish of center-drilled hole has greatly been improved.
Circularity of center drilled hole as well as run-out tolerance of turning axis has been improved.

Enlarged picture





Circularity of center drilled 60° face

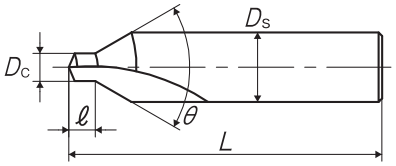
Recommended cutting condition

●Material : Carbon Steels(S55C) Alloy Steels(SCM440)

Designation Dc×θ×Ds	Feed (mm/rev)	Revolution speed (min^{-1})
1×60°×4	0.1	3,800
1.5×60°×5		2,400
2×60°×6	0.15	1,900
2.5×60°×8		1,500
3×60°×8		1,200
4×60°×10	0.2	1,000
5×60°×12		800
6×60°×16		600

Drill dia.	Shank dia.	Overall length	Drill length	Workpiece end-face Hole size
Dc	Ds	L	ℓ	Dw

TYPE : 1



Segment : 51

Size Dc × θ × Ds	Code	Dc (mm)	Ds (mm)	L (mm)	ℓ (mm)	Dw (mm)	TYPE	MSRP
1 × 60° × 4	VMHCD1.0S	1	4	30	1	2.5	1	¥ 2,600
1.5 × 60° × 5	VMHCD1.5S	1.5	5	30	1.5	4	1	¥ 2,470
2 × 60° ×6	VMHCD2.0S	2	6	30	1.9	5	1	¥ 2,700
2.5 × 60° × 8	VMHCD2.5S	2.5	8	40	2.4	6.5	1	¥ 3,270
3 × 60° × 8	VMHCD3.0S	3	8	40	2.8	6.5	1	¥ 3,270
4 × 60° × 10	VMHCD4.0S	4	10	45	3.8	8.5	1	¥ 4,780
5 × 60° × 12	VMHCD5.0S	5	12	55	4.6	10	1	¥ 6,170
6 × 60° ×16	VMHCD6.0S	6	16	65	5.5	13.5	1	¥ 14,400

・Machining conditions are calculated based on the workpiece end-face hole size Dw.
・For details on machining conditions, see TECHNICAL INFORMATION, “27. Table of recommend centering condition.”