Small-diameter deep hole drilling via innovative *grinding technology*

Coolant through motor spindle

CTM-4020

Tool shank diameter ϕ3.0–ϕ6.35 mm

A new motor spindle capable of 30 MPa high-pressure coolant has been added to the product line, which performs processing by compressively injecting coolant from the rear of the spindle and discharging it at the tool tip. Coolant can be sufficiently discharged even with small-diameter tools of ϕ0.5 mm, resulting in good chip evacuation, improved processing accuracy and shorter processing time.

Max. rotation speed 20,000 min^{-1}

Spindle accuracy Within 1 μm

Capable of 30 MPa high-pressure coolant

Drilling data

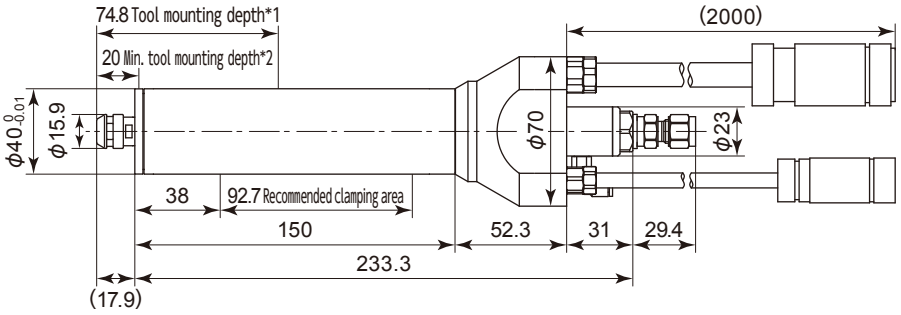
Drilling ϕ0.5 mm × depth 6 mm (L/D = 12)

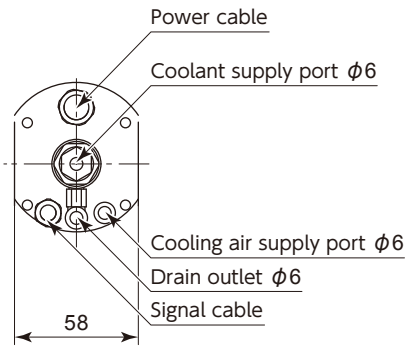
Motor spindle	CTM-4020
Tool	Drill with through coolant holes (Mitsubishi Materials/MWS0050XB-VP15TF)
Workpiece material	Stainless steel 303
Hole depth	6 mm, through hole L/D = 12
Coolant	Water-insoluble, internal lubrication at 30 MPa
Pilot hole	depth 1 mm

	Tool manufacturer's recommended conditions	Nakanishi's proposed conditions
Cutting speed [m/min]	20	31
Motor speed [min^{-1}]	12,700	20,000
Feed rate [mm/rev]	0.008	0.01
Feed speed [mm/min]	100 → Productivity 2 times →	200
Peck drilling cycle	-	No pecking

Specifications

Code No.: 7918	Model: CTM-4020





*1 For ϕ4–ϕ6.35 mm shank tool.
(For less than ϕ4 mm shank tool, it is a through hole.)
*2 If the tool is not inserted more than 20 mm from the tip of the collet, coolant will leak from the collet.

O.D.	Max. rotation speed	Spindle accuracy	Max. power	Net weight	Coolant pressure
ϕ40 mm	20,000 min^{-1}	Within 1 µm	1,200 W	2.6 kg	0.5–30 MPa

Standard equipment and accessories	Collet nut (K-265) / Wrench (12 × 14): 2 pcs.

*Collet is sold separately. Select the suitable size from the collet CHK-OH group.

Combination example

Collet	Motor spindle	Motor cord	Controller	Air line kit
 CHK-OH ϕ3.0–ϕ6.35 mm	 CTM-4020 : Grip ring  GR-40	Power cable 2 m/4 m/6 m EMCD-4000-2M/4M/6M Signal cable 2 m/4 m/6 m EMCD-4000S-2M/4M/6M	 E4000 CONTROLLER	 AL-C1204 *Supply cooling air

Drilling example

Drilling ϕ2.0 mm × depth 19 mm through holes

- Motor spindle: CTM-4020
- Processing machine: multitasking machine OKUMA MULTUS U3000
- Tool: drill with through coolant holes
  (Mitsubishi Materials/MVS0200X12S030)
- Workpiece material: soft magnetic iron (ELCH2)
- Coolant: water soluble, internal lubrication at 3 MPa

Peck drilling 5 times → No pecking

	Current conditions	Nakanishi's proposed conditions
Cutting speed [m/min]	40	125
Motor speed [min^{-1}]	6,400	20,000
Feed rate [mm/rev]	0.03	0.06
Feed speed [mm/min]	192	1,200
Peck drilling cycle	Front: 3.5 mm × 3 times Rear: 4.0 mm × 2 times	No pecking

Productivity 6.25 times

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