NAKANISHI

Taking CNC automatic lathes to its new heights

E3000i SERIES

BMF-3160-CTZ

Flange type motor spindle for CNC automatic lathe

BMF-3130-CTZ

Flange type torque motor spindle for CNC automatic lathe

Case Study 1

Check out the video for more details.

[Brass ϕ1 × 3 mm & ϕ3 × 13 mm Drilling]

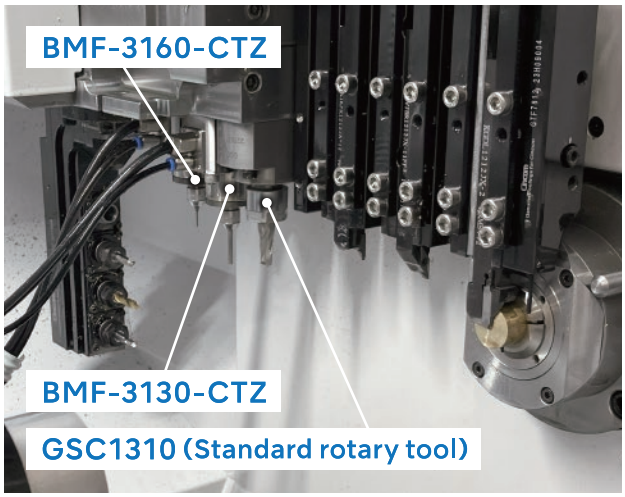
Machine tool: CNC automatic lathe (CITIZEN MACHINERY CO., LTD. / Cincom L20XII LFV)
Workpiece: Brass (C3604)
Conditions: Dry (no coolant)

ϕ1 × 3 mm Drilling

- Spindle: BMF-3160-CTZ
- Tool: ϕ1 Drill for non-ferrous metal machining (Mitsubishi Materials Corporation / DC-SSSD0100)
- Hole depth: 3 mm (no pecking)

	Tool manufacturer's proposed conditions	Nakanishi's proposed conditions
Cutting speed [m/min]	63	188
Motor speed [min^{-1}]	20,000	60,000
Feed per revolution [mm/rev]	0.02	0.033
Feed rate [mm/min]	400 → 5 times →	2,000

Processing efficiency increased by 5 times faster feed rate



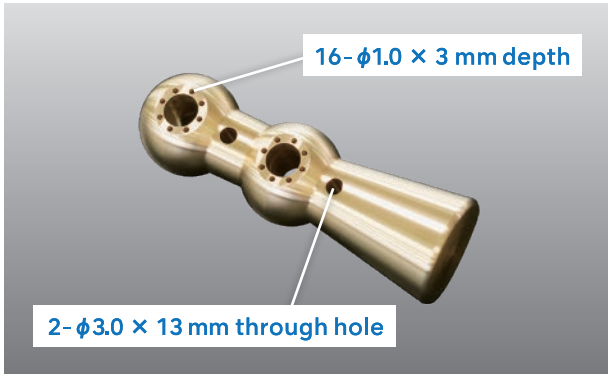
*Mounted on CITIZEN Cincom L20XII LFV

ϕ3 × 13 mm Drilling

- Spindle: BMF-3130-CTZ
- Tool: ϕ3 Solid carbide drill (Mitsubishi Materials Corporation / MAE0300MB)
- Hole depth: 13 mm (3 mm/step)

	Tool manufacturer's proposed conditions	Nakanishi's proposed conditions
Cutting speed [m/min]	90	283
Motor speed [min^{-1}]	9,554	30,000
Feed per revolution [mm/rev]	0.15	0.183
Feed rate [mm/min]	1,433 → 3.8 times →	5,500

Processing efficiency increased by 3.8 times faster feed rate



Case Study 2

Check out the video for more details.

[R2 Ball End Mill Brass Cutting]

CNC Automatic Lathe × 60,000 min^{-1} Flange Type Spindle

- Spindle : BMF-3160-CTZ
- Machine : CNC automatic lathe（CITIZEN MACHINERY CO.,LTD. /Cincom L20XII LFV）
- Tool : R2 ball end mill（NS TOOL CO.,LTD. / RSB230 R2×12）
- Workpiece material : Brass（C3604）

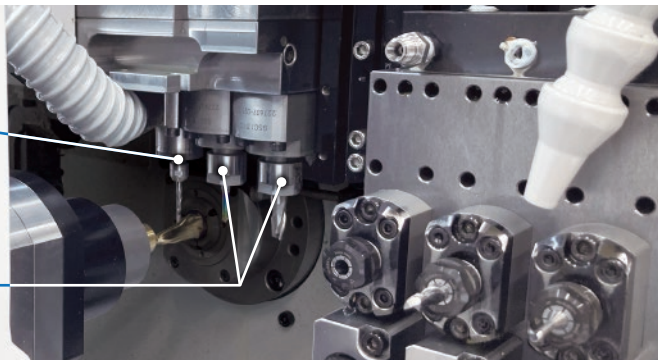
BMF-3160-CTZ

Nakanishi 60,000 min^{-1} high-speed spindle

GSC1310

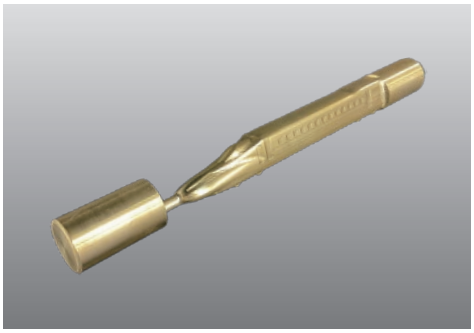
Standard rotary tool

*Mounted on CITIZEN Cincom L20XII LFV



	Conventional conditions (Standard rotary tool)	Nakanishi's proposed conditions
Cutting speed [m/min]	75	754
Motor speed [min^{-1}]	6,000	60,000
Feed rate [mm/min]	360 (10 times)	3,600
Feed per blade [mm/tooth]	0.03	0.03
Depth of cut (Ap × Ae) [mm]	0.03 × 0.06	0.03 × 0.06

Processing efficiency increased by 10 times faster feed rate



Shinkansen Model Made of Brass（C3604）

Machining conditions

Drill : S50C（carbon steel）

Motor spindle	Tool diameter [mm]	Hole depth [mm]	Cutting speed [m/min]	Motor speed [min^{-1}]	Feed/rev. [mm/rev]	Feed rate [mm/min]	Load meter
BMF-3160-CTZ	MISUMI Group Inc. TAC-ESDBA2.0	6 1 mm/step	126	20,000	0.010	200	Red
BMF-3130-CTZ	MISUMI Group Inc. TAC-ESDBA2.5	7.5 2.5 mm/step	126	16,000	0.020	320	Yellow 1

End mill : A5052（aluminum alloy）

Motor spindle	Tool diameter [mm]	Cutting speed [m/min]	Motor speed [min^{-1}]	Feed per blade [mm/tooth]	Feed rate [mm/min]	Cutting depth Ap × Ae [mm]	Load meter
BMF-3160-CTZ	Mitsubishi Materials Corporation MS2ES ϕ3.0	565	60,000	0.02	2,400	0.3 × 2.7	Blue 1
BMF-3130-CTZ	Mitsubishi Materials Corporation MS2ES ϕ3.5	330	30,000	0.05	3,000	0.35 × 3.15	Blue 1

End mill : S50C（carbon steel）

Motor spindle	Tool diameter [mm]	Cutting speed [m/min]	Motor speed [min^{-1}]	Feed per blade [mm/tooth]	Feed rate [mm/min]	Cutting depth Ap × Ae [mm]	Load meter
BMF-3160-CTZ	Mitsubishi Materials Corporation MS2ES ϕ2.5	149	19,000	0.02	570	0.25 × 2.25	Blue 1
BMF-3130-CTZ	Mitsubishi Materials Corporation MS2ES ϕ3.0	151	16,000	0.02	640	0.3 × 2.7	Blue 1

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*Specifications and design are subject to change without notice.

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