

Taking CNC automatic lathes to its new heights

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

[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 L20VII LFV)
- Tool : R2 ball end mill (NS TOOL CO.,LTD. / DRB230 R2×12)
- Workpiece material : Brass (C3604)

Check out
the video
for more details.



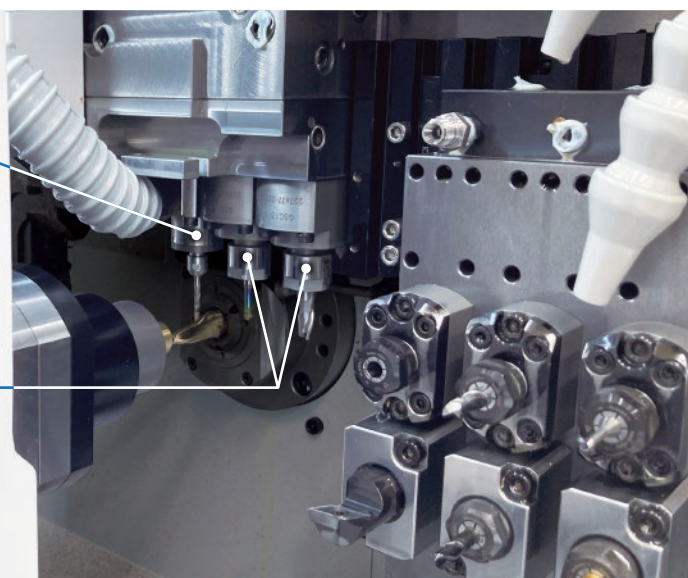
BMF-3160-CTZ

Nakanishi 60,000 min⁻¹ high-speed spindle

GSC1310

Standard rotary tool

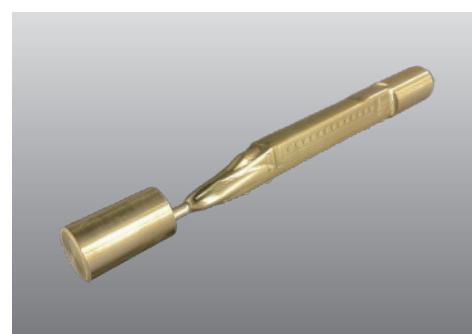
*Mounted on CITIZEN Cincom L20VII LFV



	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	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

**10
times**

Processing efficiency increased by 10 times faster feed rate



Shinkansen Model Made of Brass (C3604)

Case Study 2

- Spindle : BMF-3160-CTZ / BMF-3130-CTZ
- Machine : CNC automatic lathe (CITIZEN MACHINERY CO.,LTD. /Cincom L32-1M10)
- Workpiece material : Aluminum (A5052)

BMF-3130-CTZ

Nakanishi 30,000 min⁻¹ torque spindle

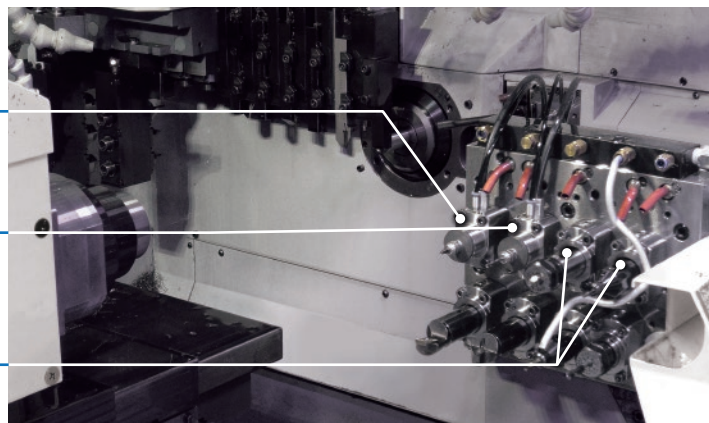
BMF-3160-CTZ

Nakanishi 60,000 min⁻¹ high-speed spindle

GSC1310

Standard rotary tool

*Mounted on CITIZEN Cincom L32-1M10



Drilling $\phi 3.0$ mm $\times$ 9 mm

BMF-3130-CTZ Tool : NACHI DLCDR3.0

	Conventional conditions (Standard rotary tool)	Nakanishi's proposed conditions
Cutting speed [m/min]	57	198
Motor speed [min ⁻¹]	6,000	21,000
Feed per revolution [mm/rev]	0.057	0.050
Feed rate [mm/min]	342	1,050
Load meter	-	Yellow 1

**Processing efficiency increased by
3 times faster feed rate**

Drilling $\phi 2.5$ mm $\times$ 7.5 mm

BMF-3160-CTZ Tool : NACHI DLCDR2.5

	Conventional conditions (Standard rotary tool)	Nakanishi's proposed conditions
Cutting speed [m/min]	47	196
Motor speed [min ⁻¹]	6,000	25,000
Feed per revolution [mm/rev]	0.046	0.040
Feed rate [mm/min]	276	1,000
Load meter	-	Yellow 1

**Processing efficiency improved by
3.6 times faster feed rate**

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 $\times$ ae [mm]	Load meter
BMF-3160-CTZ	Mitsubishi Materials Corporation MS2ES $\phi 3.0$	565	60,000	0.02	2,400	0.3 $\times$ 2.7	Blue 1
BMF-3130-CTZ	Mitsubishi Materials Corporation MS2ES $\phi 3.5$	330	30,000	0.05	3,000	0.35 $\times$ 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 $\times$ ae [mm]	Load meter
BMF-3160-CTZ	Mitsubishi Materials Corporation MS2ES $\phi 2.5$	149	19,000	0.02	570	0.25 $\times$ 2.25	Blue 1
BMF-3130-CTZ	Mitsubishi Materials Corporation MS2ES $\phi 3.0$	151	16,000	0.02	640	0.3 $\times$ 2.7	Blue 1



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*Specifications and design are subject to change without notice.

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NAKANISHI INC. 2025

PR-K412E Ver.1 2025-06-04 010.NP 10

