

Ultra high speed machining via innovative *grinding technology*

Air turbine spindle for machining centers

HTS1500ZZ-M2040

Tool shank diameter $\phi 0.5 - \phi 4.0$ mm

The high speed rotation enables outstanding performance in ball end milling of R0.5 mm or less, where a high peripheral speed is required. Low heat generation due to air-driven cooling effect, which stabilizes Z-axis displacement (axial expansion) in 1 minute. Static torque, radial rigidity, and axial rigidity have been improved compared to the previous model HTS1501S.



Max. rotation speed
150,000
min⁻¹

Spindle accuracy
1 Within
 μm

Z-axis displacement stabilized in
1
minute

Machining data Rib machining with R0.3 mm CBN ball end mill



Spindle	HTS1500ZZ-M2040	Tool	2-flute CBN ball end mill R0.3 × 5 (NS TOOL/SSBL200)
Processing machine	Machining center Sodick MC430L	Processing	Groove milling
Workpiece material	Plastic mold steel STAVAX (HRC 52)		

	Conventional conditions (machining center spindle)	Nakanishi's proposed conditions
Cutting speed [m/min]	57	283
Rotation speed [min ⁻¹]	30,000	150,000
Feed speed [mm/min]	800	2,000
Feed [mm/tooth]	0.011	0.007
Cutting depth Ap [mm]	0.005	0.005
Processing time	1h 26 min 18 sec	37 min 56 sec

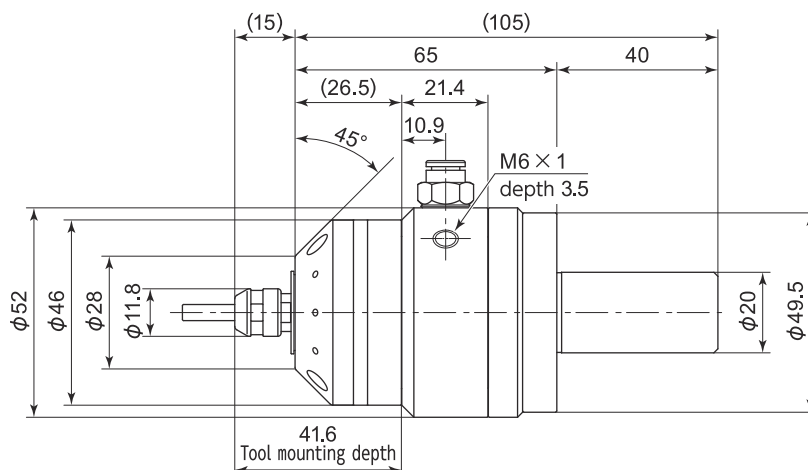
56%
reduction



Specifications

Code No.: 7919





Model: HTS1500ZZ-M2040



Max. power	Max. rotation speed	Spindle accuracy	Air consumption	Net weight	Corresponding tool		
54 W	150,000 min ⁻¹	Within 1 µm	175 NL/min	860 g	Square end mill φ1.0 mm or less	Ball end mill R0.5 mm or less	Grindstone φ4.0 mm or less

Standard equipment and accessories: Collet φ4.0 mm (CHA-4.0) / Collet nut (CHN-AA) / Wrench (8 × 5), (9 × 11): 1 pc. each
Hose φ6 mm × 4 m (K-247) with Filter joint (FJ-01)

Combination example

Collet	Spindle	Air line kit
 CHA φ0.5-φ4.0mm	 HTS1500ZZ-M2040	 or  AL-M1202 AL-M1201BL *Supply clean, regulated, and lubricated air

Milling example

High feed and low depth milling with R0.1 mm CBN ball end mill

- Workpiece material: cold die steel DC53 (HRC 60)
- Tool: 2-flute CBN ball end mill R0.1 × 0.6 (NS TOOL/SSBL200)

	Tool manufacturer's recommended conditions	Nakanishi's proposed conditions
Cutting speed [m/min]	31	94
Rotation speed [min ⁻¹]	50,000	150,000
Feed speed [mm/min]	380	2,250
Feed [mm/tooth]	0.0038	0.0075
Cutting depth Ap × Ae [mm]	0.005 × 0.005	0.05 × 0.01
Processing time	-	3 h 20 min

Productivity **5.9 times**



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NAKANISHI INC. 2025

PR-K404E Ver.1 2024-12-17 XXX.YX [XX]

