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Press Release

March 2, 2010

Announcing a new large model in the NH Series of high speed, high precision horizontal machining centers!

Mori Seiki starts taking orders for the NH10000 DCG.

Mori Seiki Co., Ltd. will start taking orders for the **NH10000 DCG** high speed, high precision horizontal machining centers from March 2, 2010.

In recent years, the need for machine tools that achieve higher levels of efficiency and precision has been increasing as the demand for high efficiency and high precision machining of large parts and difficult-to-cut materials used in the construction machinery, aircraft and printing equipment industries has been growing. In response to this need, Mori Seiki has developed the NH10000 DCG, the latest model in our NH Series of high speed, high precision horizontal machining centers.

The NH Series boasts orders of approximately 6,000 units since the release of the NH5000 in August, 2002. The NH4000 DCG equipped with our original technologies, **DCG (Driven at the Center of Gravity) and DDM (Direct Drive Motor),** for example, has been highly praised by customers for its high speed and high precision machining ability since its release in September, 2003.

The NH10000 DCG can handle a maximum workpiece size of ϕ 2,000 mm x 1,600 mm and a maximum loading capacity of 3,000 kg (5,000 kg as option). It achieves **high speed and high precision machining** using the NH Series machine construction that has been offering excellent performance. It also offers stable machining accuracy and better machining conditions **with its new functions**.

For operability, the NH10000 DCG is designed to facilitate setup operations, including the center alignment of a workpiece. The height difference between inside and outside of the machine has been eliminated by installing work platforms. (In the case of large machines, the setup operations are usually conducted inside the machine.) In addition, by using the setup station with large working area and wide door opening, the machine offers **improved operability and accessibility.**

We have also prepared **options,** including long tool specifications and automatic indexing setup station specifications, **for machining of large workpieces,** so that our customers can choose according to their need.

Mori Seiki will continue to provide a wide range of products from small to large machines in order to suit each and every customer need.

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Type	High-Precision Horizontal Machining Center
Model	NH10000 DCG
Market	Construction machinery, aircraft, printing equipment, industrial machinery, energy, etc.
Orders start	March 2, 2010
Production	5 units/month

■ Features

1. High-speed, high-precision machining

The NH10000 DCG has pursued the concept of the NH Series that offers high speed, high precision machining. Since it uses the Box-in-Box Construction, which supports the saddle at both sides, the center of gravity of the moving parts is guided and driven with excellent balance despite its large structure. It also achieves roundness of 2.12 μm (when the scale is provided) by minimizing residual tool tip vibration during positioning and by improving machined surface quality. For the drive system on the X and Z linear axes, it uses DCG that driving moving parts at their center of gravity using two ball screws. This controls vibration, the main factor preventing high-speed, high-precision machining, and offers greater machining accuracy, shorter machining time and longer tool life. Moreover, it achieves rapid traverse rate of 50 m/min (2.5 times faster than conventional machines).

For the B rotary axis, we have prepared a full indexing table using DDM as option. DDM offers improved transmission efficiency, high speed and zero backlash by transmitting the drive power directly to the rotary axis. The 90° indexing time (when a workpiece on the pallet is 5,000 kg) is shortened to 1.9 seconds, one-fifth the speed of the conventional machines.

2. New functions

The Draw-back function, available for through-spindle coolant specifications, is a function in which coolant left in the spindle is sucked back into the tank when coolant stops flowing. This prevents the residual coolant from adhering to the spindle taper and being carried into the tool magazine during tool change with ATC. With this function, long-term problems caused by coolant can be avoided, ensuring stable machining accuracy.

Another function that automatically changes the Z-axis stroke according to the rotation angle of the B-axis made it possible to extend the Z-axis stroke by up to 40 mm. This allows machining with a shorter tool overhang, which leads to improved machining conditions.

3. Superior operability

Designed to provide even better accessibility and operability, internal and external work platforms have been installed and the height difference between the inside and outside of the machine has been eliminated. These ensure much easier operations inside the machine such as centering of workpieces and checking of machined workpieces. With a wide door opening for the setup station (2,350 mm), the NH10000 allows easy loading and unloading of workpieces up to a diameter of 2,000 mm. Additionally, the machine is equipped with three spiral conveyors to offer excellent chip disposal. These conveyors, two of which extend

to the setup station, collect chips and coolant not only from the machining area but also from the setup station and transfer them to the external conveyor.

4. Ideal options for large workpieces

A long tool magazine capable of storing long tools up to a length of 1,000 mm, which is the same size as the pallet, is available as an option. The use of long tools enables users to perform deep hole boring and gun drilling of large workpieces that require highly accurate coaxiality without a 180-degree turn on the B-axis, achieving reduced cutting time and high-precision machining. With a maximum loading capacity of 5,000 kg (option), which is the largest among Mori Seiki horizontal machining centers, the NH10000 has the optional automatic indexing setup station that allows automatic rotation of heavy workpieces. Users can choose the ideal specifications for their machining needs.

■ Major specifications

Axis travel (X/Y/Z)	1,700/1,400/1,510 mm
Pallet working surface	1,000 x 1,000 mm
Max. pallet loading capacity	3,000 kg [5,000 kg]
Max. workpiece swing dia. x Max. workpiece height	ϕ 2,000 mm x 1,600 mm
Max. spindle speed	10,000 [15,000] [6,000] min^{-1}
Type of spindle taper hole	No.50 ［HSK A-100］
Spindle torque	10,000 min^{-1} :525 Nm [10,000 min^{-1} :600 Nm] [15,000 min^{-1} :512 Nm] [6,000 min^{-1} :1,309 Nm]
Spindle drive motor	10,000 min^{-1} : 40/30/25 kW (15%ED/30min/cont) [15,000 min^{-1}: 30/25 kW (30min/cont)] [6,000 min^{-1}: 55/45/37 kW (25%ED/30min/cont)]
Rapid traverse rate (X/Y/Z)	Spindle speed 10,000 min^{-1}, 15,000 min^{-1}: 50,000/50,000/50,000 mm/min Spindle speed 6,000 min^{-1}: 50,000/40,000/50,000 mm/min
Max. table rotational speed	[20 *1] min^{-1}
Tool storage capacity	Chain type: 60 [80] [100] [120] tools Rack type: [180] [240] [330] tools
Floor space (width x depth)	5,770 mm x 9,055 mm

[ ] Option

*1: Full-indexing table specifications

Fig. 1.　Exterior

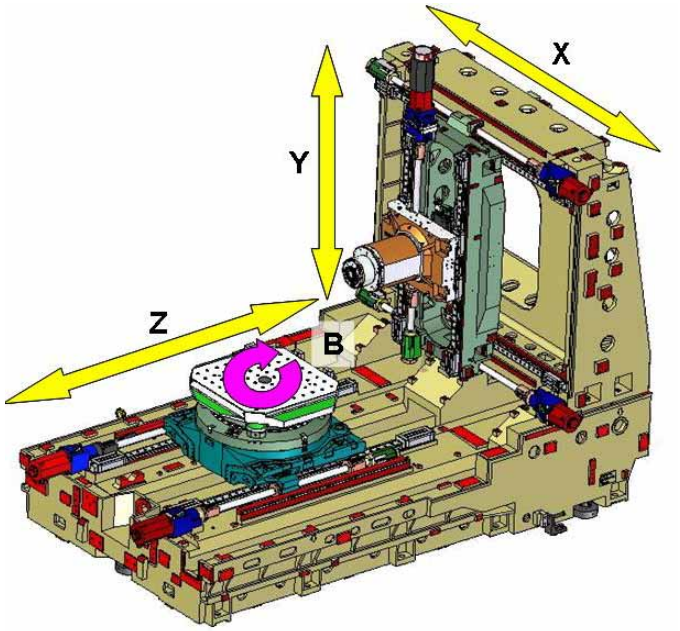

Fig. 2.　Axis structure

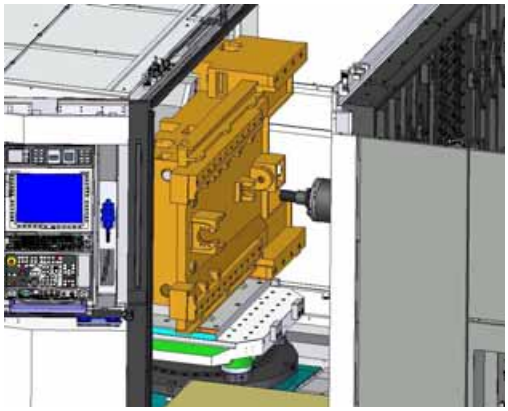

Fig. 3.　Machining example
(Bed for vertical machining center)

Fig. 4.　Machining example
(Frame for printing machine)