MORI SEIKI
THE MACHINE TOOL COMPANY

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News Release

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High Efficiency "NV1500 DCG" Vertical Machining Center With Roundness Accuracy of 0.8 μm

New Machine Model Added to the DCG (Driven at the Center of Gravity) Series

MORI SEIKI CO., LTD. is set to release a new compact vertical machining center utilizing the DCG™ theory, the "NV1500 DCG".

Despite the fact that precision die and mold manufacturers machine a large number of parts and electrodes less than 100 millimeters in size, most machines are over 2 meters in width. To improve productivity within current space limitations, machines need to be both compact, and rigid enough to machine hardened materials.

Whereas the term "compact" traditionally conflicts with notions of "cutting capability", by utilizing the highly successful and market-proven DCG™ theory, the NV1500 DCG has achieved the perfect balance of essential machine elements, epitomizing "compactness", "rigidity", "low noise" and "high precision".

For manufacturers in the small precision die and mold machining industry, the NV1500 DCG provides a new concept machining center and improved productivity.

Machine	Vertical Machining Center
Machine Model	NV1500 DCG
Customers and Markets	Corresponds to machining of dies and molds such as IC molds and connectors, and the machining of precision small parts such as electrodes, medical parts, and semi conductors.
Order Start	March 15, 2005
Production	10 Machines / Month (Limited production)

■Main Features

1. Contouring accuracy (roundness) of 0.8 μm.
2. Maximum spindle speed selections of 24,000 min^{-1} and 40,000 min^{-1}.
3. Availability of vise, System 3R chuck, or EROWA chuck installations on the table.
4. Input resolution of 0.1 μm (1/10,000 mm). (Option)
5. Maximum acceleration rates of 0.8 G (X- and Y-axes) and 1 G (Z-axis)
6. High precision achieved by isolating heat/vibration sources such as the control panel and spindle cooling oil controller from the machine body.
7. Productivity improved by moving the table 100 mm towards the operator from the machining area.
8. Ball screws and guideways that do not require lubricant replenishment and therefore do not contaminate coolant and substantially reduce lubricant usage.
9. New high accuracy MAPPS II operating system as a standard function.
10. CAPS-NET Global Edition as standard machine networking software.

【Contact Information】 Marketing Strategy Section TEL: 052-587-1827

■Features

1. Contouring accuracy (roundness) of 0.8 µm.
The NV1500 DCG has vastly improved responsiveness by reducing the weight of moving parts. Furthermore, the design achieves machine rigidity virtually unaffected by cutting resistance through the utilization of DCG™ (Driven at the Center of Gravity). As a result, minimal machine vibration has enabled the achievement of roundness accuracy of 0.8 µm in contouring, previously only thought possible on turning machines.

2. Maximum spindle speed selections of 24,000 min^{-1} and 40,000 min^{-1}
Precision die and mold machining utilizing small tools requires a high-speed spindle. The NV1500 DCG is equipped with a standard 24,000 min^{-1} spindle and includes the option of a 40,000 min^{-1} spindle to meet a wide variety of customer demands. Spindle taper shape is the HSK-E32.

3. Availability of vise, System 3R chuck, EROWA chuck installations on the table.
With processes such as electrode machining, chucking systems that enable workpieces machined on a machining center to be installed directly into electrical discharge machines are becoming increasing popular. To respond to such demands, the NV1500 DCG includes the ability to install chucks designed by global chuck manufacturing leaders System 3R and EROWA.

4. Input resolution of 0.1 µm (1/10,000 mm).
The NV1500 DCG has standard 50-nanometer resolution direct scale feedback on each axis to back up 0.1 µm control.

5. Maximum acceleration rate of 0.8 G (X- and Y-axes) and 1 G (Z-axis).
Utilization of the DCG™ (Driven at the Center of Gravity) theory offers reduced vibration and an improved acceleration rate. This directly affects productivity by significantly reducing non-cutting time.

6. High precision achieved by isolating heat/vibration sources such as the control panel and spindle cooling oil controller from the machine body.
The expansion rate of iron is fixed; therefore, the smaller the machine, the less influence by temperature changes. By designing the NV1500 DCG as small as possible, superior resistance to temperature changes has been achieved. Furthermore, high precision was achieved by isolating heat/vibration sources such as the spindle cooling oil controller from the main body and by circulating coolant through the motor bracket to control heat from the feed axis motor.

7. Productivity improved by moving the table 100 mm towards the operator from the machining area.
Even with the compactness of the NV1500 DCG, fundamental machine tool requirements such as table accessibility and user-friendliness were an important part of the design process. By moving the table 100 mm closer to the operator from the machining stroke range during work setup, operator workload is greatly reduced and safety improved.

8. Ball screws and guideways that do not require lubricant replenishment and therefore do not contaminate coolant and substantially reduce lubricant usage.
The NV1500 DCG is equipped with roller guides that do not require lubricant replenishment, reducing lubricant consumption to 0.22 mL/hour. Furthermore, required power sources have been reduced to less than half that of a conventional No. 40 taper machining center.

9. New high accuracy MAPPS II operating system as a standard function
The MAPPS II operating system, installed as standard, offers higher speed, greater user-friendliness and next generation levels of graphic functionality, safety, and maintainability by reinforcing the conversational input function. Furthermore, the standard 50 MB user memory capacity enables direct operation of large programs required for die and mold machining.

10. CAPS-NET Global Edition as standard machine networking software.
The CAPS-NET Global Edition customer support service that uses wireless and Internet communication is installed as standard. This software enables collection and storage of a broad range of information from multiple machine production sites, and customized configurations in order to guarantee supply of vital production information to both machine and operator. Furthermore, a remote operation system is available 24 hours a day, 365 days a year via network connection.

11. DCG™（Driven at the Center of Gravity）

Please refer to the explanation of the DCG™ Theory on pages 8 and 9 in the NV1500 DCG product catalog.

■Main Specifications

Travel	X-axis 150 mm, Y-axis 150 mm (+100 mm), Z-axis 200 mm
Pallet working surface	230×220 mm
Maximum spindle speed	24,000 [40,000] min^{-1}
Rapid traverse rate（X, Y, Z）	15,000 mm/min
Cutting speed	15,000 mm/min
Tool storage capacity	30
Tool change time (chip-to-chip)	3.5 sec.
Tool change time (tool-to-tool)	1.7 sec.
Tool shank type	HSK E32
Mass of machine	2,500 kg
Spindle motor (25%ED/cont.)	5.5/3.7 kW
Machine size	W 850 mm × D 1,935 mm × H 2,092 mm

[ ] shows options

■Main Options

Recommended die and mold package（AI contouring control function II, fast data server, ATA card）
Input resolution 0.1 μm
AWC (Automatic Workpiece Changer)
Through-spindle air
Tool length automatic measurement unit (Non-contact type)

■Other

Exhibitions to unveil the NV1500 DCG will be held from March 18 to 31, 2005 at the Chiba and Iga Campuses. The machine will also be placed on display at Tokyo Big Sight during INTERMOLD 2005.