

Vertical Multi-Process Grinding Machine "Vertical Mate 55 2nd Generation"

TAIYO KOKI Co., Ltd. is pleased to announce a release of CNC Vertical Multi-Process Grinding Machine "Vertical Mate 55 2nd Generation". We have developed this model to build new automation solutions and make a wide range of contributions around the world in addition to the World Class vertical grinders that we have built up over the past 30 years.

Since its launch in 2010, Vertical Mate series has been well received by customers in a variety of industries, including aircraft, automotive, industrial machinery, machine tools and semiconductors for its ability with its single grinding spindle and ATC which performs high-accuracy processes (roundness: 1.0 $\mu\text{m}^{\ast 1}$) of ID, OD and face with one-time chucking.

As well as Vertical Mate 85 2nd Generation which we released in October 2024, Vertical Mate 55 has significantly upgraded performance.

Equipped with the *speedMASTER* grinding spindle developed by DMG MORI, it achieves max. power output: 18.5 kW, torque: 36.8 N·m, and max. rotation speed: 18,000 min⁻¹.

The mechanical structure is thoroughly optimized through FEM analysis and vibration testing. The machine back cover has been added as standard. The 2nd Generation machine base structure minimizes the influence of heat on dimensional changes by 60%, it provides even better thermal stability and accuracy than the conventional model.

The user interface is changed to *ERGOline X* with large-screen touch panel and easy-to-press hard buttons. Its user-friendly design provides increased visibility and operability.

It also supports Digital Transformation (DX) with Service platform: *my DMG MORI*, Visualizing machine operating conditions: DMG MORI Messenger, etc., and provides anti-virus security with whitelist-type software.

Compared to the first generation, Vertical Mate 55 2nd Generation is more economical, it uses energy more efficiently by reducing power consumption by 21% due to the inverter control of coolant pumps and the improved processing efficiency by *speedMASTER* grinding spindle.

Automatic in-cycle part measuring device and Z-axis scale, which are essential for high-precision grinding, are now included as standard.

By changing tank from single-layer to double-layer, the coolant cleanliness is further improved. It reduces the frequency of coolant replacement. In addition, paper filter^{*2} is able to remove large amounts of grinding swarf and wheel particles which prevents clogging and machine stops.

Built-in mist collector *zeroFOG*^{*2}, which collects fine particles (particle size: 0.3 μm) is also available.

Press Release

Furthermore, the 400V specification is adopted as for Vertical Mate 2nd Generation adding "a high-precision vertical multi-process grinding machine that can be used by customers all over the world" to the development concept. Apart from being transformer-free in the European region, the new machine has reduced power consumption and increased output compared to the first generation and has increased the added value of the machine itself.

<Comparison to the 1st generation>

	Vertical Mate 1 st Generation	Vertical Mate 2 nd Generation
Rapid feed rate of X/Z axis	16 m/ min	24 m/ min (50% up)
Work spindle output	3.7kW	8.0 kW (VM85) (116% up) / 14.0 kW (VM55) (278% up)

It can also be combined with DMG MORI's PH Cell automation system, which focuses on improving operation rate and stabilizing quality.

The PH Cell uses pallet transfer from the side of the machine to ensure excellent accessibility to the processing space and visibility inside the machine. The modular structure allows the selection of various sizes and types of pallets and stockers, flexibly accommodating high-mix low-volume production. The automated system, which can complete the entire process from material supply to finished product discharge, contributes to increased customer profits by improving productivity through unmanned operation during nighttime and holidays.

We will continue to develop highly functional, reliable, and investment-worthy products to the market in order to meet various needs of more customers and expand overseas sales as DMG MORI Precision Grinding.

Detailed information on TAIYO KOKI website:

<https://www.taiyokoki.com/en/products/vertical-mate-55-2nd-generation/>

Press Release

Main features of Vertical Mate 2nd Generation Series

✓ speedMASTER grinding spindle developed by DMG MORI

- The best-in-class max. power output and max. rotation speed
- 3-year warranty
- Spindle through coolant ^{*2}

✓ Optimization of machine structure

- Realizes more efficient and accurate grinding by reducing the influence of thermal displacement by 60% compared to the 1st generation by reviewing the bed structure and standardizing the back cover

✓ User interface ERGOline X with CELOS X

- Easy-of-use operation panel based on a dedicated ergonomic design
- Comfortable operation combining a large touch panel screen and easy-to-press hard buttons
- Conversational grinding program software "GriPS III" reduces programming time
- Extensive applications in CELOS X support efficient production

✓ Contribution to energy saving

- Reduces power consumption 21% compared to the previous model^{*3}

✓ Proposal of total solution by "High precision × Automation"

- Increases productivity by reducing non-grinding time when coupled with DMG MORI's PH Cell handling system
- Various sizes, types, and number of pallets to be stored can be selected
- Flexible support for high-mix low-volume production

<Grinding spindle: comparison to the 1st generation>

	Vertical Mate 55 (HSK-E63)		Vertical Mate 85 (HSK-E100)	
Grinding spindle	1 st Generation	2 nd Generation	Grinding spindle	1 st Generation
Max. power output	15.0kW	18.5kW (23% up) / 22 kW ^{*2}	Max. power output	15.0kW
Max. rotation speed	15,000min ⁻¹	18,000 min ⁻¹ (20% up) 30,000 min ⁻¹ ^{*2}	Max. rotation speed	9,000min ⁻¹
				10,000 min ⁻¹ (11% up) 15,000 min ⁻¹ ^{*2}

^{*1} Evaluation of TAIYO KOKI standard test piece

^{*2} Option

^{*3} This data may not be obtained due to grinding conditions or environmental conditions at the time of measurement.

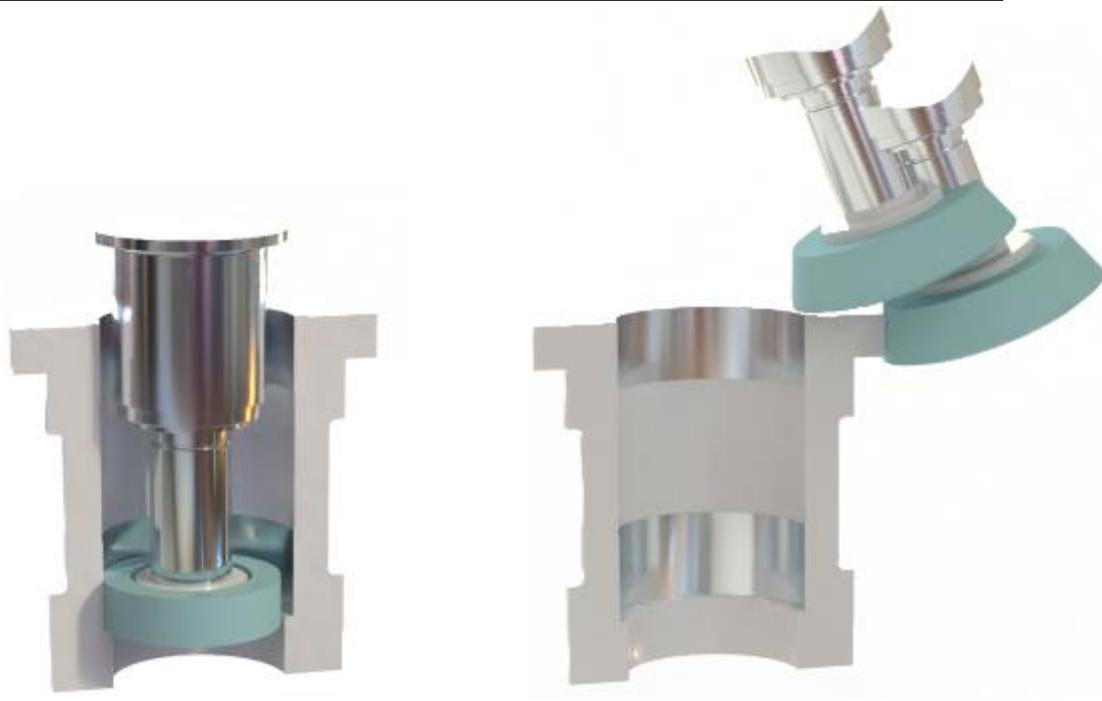
Press Release



Vertical Mate 55 2nd Generation



Vertical Mate 2nd Generation Series with PH Cell



Internal grinding

External / Face grinding

High-precision multi-processing with one-time chucking

Machine Tool

Sleeve
ID, OD, Face



Φ180 mm x 95 mm (S45C)

Construction Machinery

Bevel gear
ID, Face



Φ440 mm x 57 mm (SCM)

Machine Tool

Face Mill
ID, Face



Φ230 mm x 61 mm (SCM440)

Sample of Workpieces