

Press Release

November 6th, 2024

Space-saving processing of 3,000 mm parts with the LASERTEC 3000 | 3000 *DED hybrid* 2nd Generation

DMG MORI CO., LTD. (hereinafter referred to as “DMG MORI”) has combined its mill-turn machines with laser deposition technology for cutting applications and Additive Manufacturing (hereinafter “AM”) on one machine in one chucking. Meet the newest entry of the LASERTEC *DED hybrid* series: the LASERTEC 3000 | 3000 *DED hybrid* 2nd Generation for a max. workpiece length of 3,018 mm.

In recent years, AM has become increasingly popular in fields such as industrial machinery, oil and gas, aircraft, space, die and mold, and energy for creating complex shapes impossible with conventional cutting. In addition, the need for high-mix, low-volume production is growing alongside more diversified production styles, thus generating demand for process integration machines capable of both building, coating, and repair by AM together with subtractive cutting.

In September 2021, DMG MORI answered this need with the LASERTEC 3000 | 1500 *DED hybrid* for workpieces up to 1,519.3 mm in length. Now, we have further expanded the applicable workpiece size with the LASERTEC 3000 | 3000 *DED hybrid* 2nd Generation.

With a space-saving machine footprint of 9,642 mm (W) x 5,081 mm^{*2} (D), customers can build parts up to $\phi 400$ mm x 2,821 mm^{*3}. After the deposition, the AM head is stored away in the AM head stocker to enable subtractive post processing without setup changes in the same chucking. Also, the AM Assistant comes with melt pool monitoring to check deposition conditions and adjust laser output as well as working distance monitoring to monitor the distance between the powder nozzle and the melting point, thus avoiding workpiece defects and realizing stable high-quality AM processes. In addition, operator safety is ensured by detecting laser light leakage with the laser safety window and laser light detection sensor, and by collecting metal fumes with the fume collector.

The LASERTEC 3000 | 3000 *DED hybrid* 2nd Generation integrates conventional cutting and AM processes to allow customers to make efficient and green use of resources by only depositing material in the necessary spots. At DMG MORI, we promote this GX (Green Transformation) by using the LASERTEC *DED hybrid* series for the internal production of our own machine tool components, and we intend to further expand this in the future. In recognition of the technological development of hybrid metal deposition machines for process integration and energy saving, we received the 2023 Japan Society of Mechanical Engineers Award (Technology).

The LASERTEC 3000 | 3000 *DED hybrid 2nd* Generation will be on display at JIMTOF 2024 at Tokyo Big Sight from November 5-10, Tuesday to Sunday.

■Main features

- ① Hybrid machine for integrated cutting and additive manufacturing
 - Max. workpiece size: $\phi 400 \text{ mm} \times 2,821 \text{ mm}$ (B-axis at 90°)
Swivel the AM head for flange depositions with workpiece sizes $\phi 670 \text{ mm} \times 1,990 \text{ mm}$
 - (B-axis at 0°) and $\phi 670 \text{ mm} \times 2,430 \text{ mm}$ (B-axis at 180°)^{*5}
 - Space-saving machine footprint of $9,642 \text{ mm (W)} \times 5,081 \text{ mm}^2 \text{ (D)}$

- ② Additive solution for a variety of markets
 - Coating to improve corrosion and wear resistance for gear tooth surfaces, etc.
 - Repair of worn/broken parts of turbine plates, tools, molds, etc.
 - Cladding of limited spots of three-dimensional finished parts and prototypes in small lots
 - Multi-metal depositions to combine different materials/hardness degrees for press molds, etc.

- ③ All-in-one for a safe working environment
 - AM head for powder supply & laser irradiation mounted on the turning/milling spindle compactMASTER
 - + Laser output 3 kW
 - + Laser spot size 3 mm and 1.6 mm available
 - + With two AM nozzle types: coaxial and multi-jet
 - + Avoid cutting chips and coolant adhesion inside the AM head and optics by storing the AM head in the designated AM head stocker during conventional cutting
 - Safe for operators with the laser safety window, laser light detection sensor, and fume collector
 - + Laser beams are detected before penetrating the machine cover and shut down, thus achieving Laser class 1 with doors closed^{*6}
 - + Metal fume generated during deposition collected by fume collector
 - Intuitive control with the Human Machine Interface *ERGOline X* with CELOS X
 - High maintainability to reduce manual work
 - + With powder feeder on the front of the machine to control the powder flow
 - + With *zero-sluge*COOLANT as standard to efficiently collect fine sludge in the coolant tank
 - + With the built-in mist collector *zeroFOG* to efficiently collect mist and maintain a clean factory

- ④ AM Assistant supports high-quality depositions
 - Automatic powder calibration to control the powder supply

- Temperature monitoring in the machining area*4
- Workpiece distance monitoring from the melt pool to the powder nozzle
- Continuous melt pool monitoring to detect adhesion of material to the nozzle

DMG MORI will continue to address customer needs with highly functional and reliable product releases worth your investment.

Product	LASERTEC 3000 3000 <i>DED hybrid 2nd</i> Generation
Target industries	Industrial machinery, oil/gas, aircraft, space, die & mold, energy, etc.

*1 DED (Directed Energy Deposition) is the method of simultaneous powder supply and laser irradiation to melt powder and solidify it for structural build-up.

*2 With 38-tools tool stocker

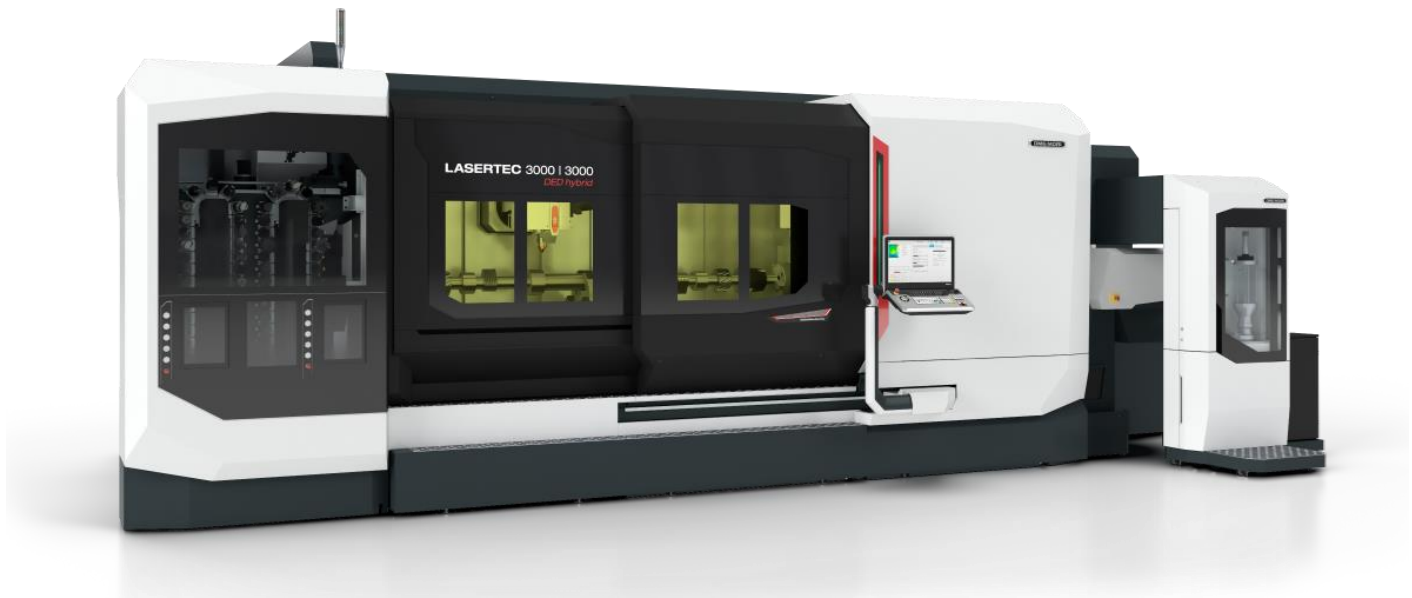
*3 With the AM head in vertical position (B-axis 90°)

*4 Option

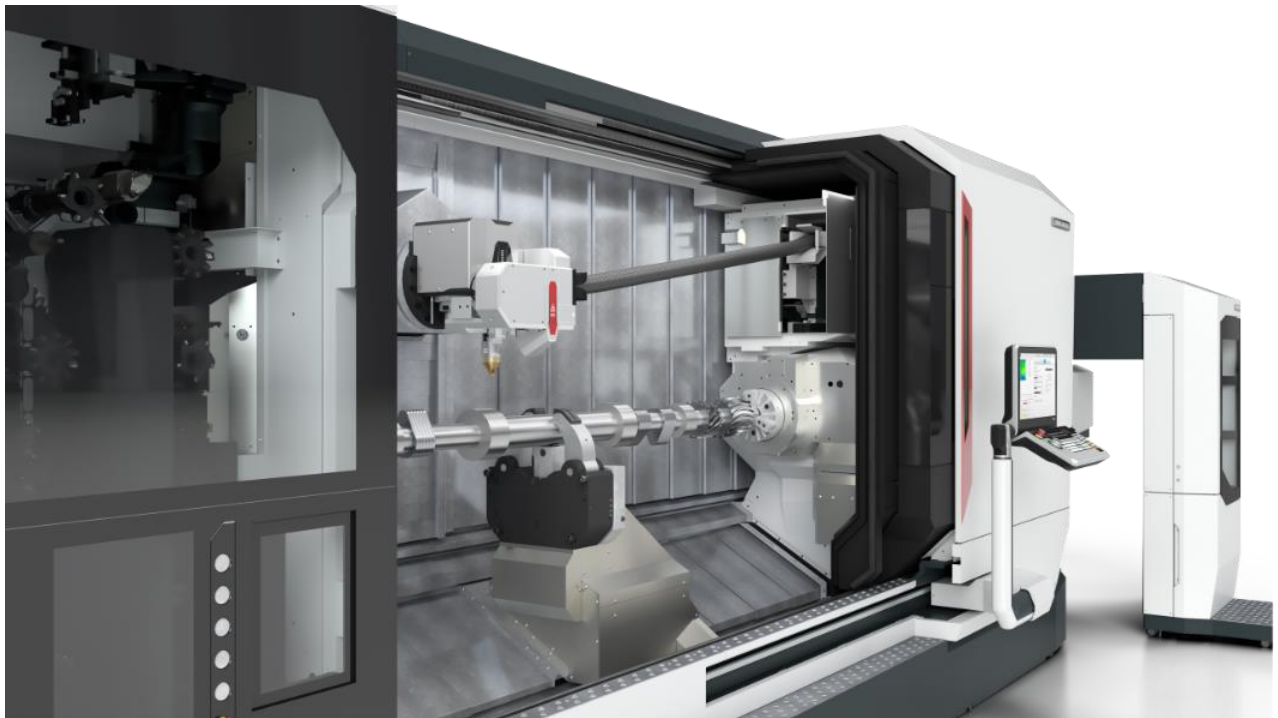
*5 Possible shapes vary depending on angles of workpiece and head.

*6 IEC 60825-1 is a safety standard class 1 and describes safe use even for direct in-beam observation for extended periods of time and observation even with optical instruments (loupe or binoculars).

※DMG MORI CO., LTD., DMG MORI, CELOS, compactMASTER, *zero-sludge*, and *zeroFOG* are registered trademarks or trademarks of DMG MORI CO., LTD.



LASERTEC 3000 | 3000 *DED hybrid 2nd* Generation (outside view)



LASERTEC 3000 | 3000 *DED hybrid 2nd Generation* (inside view)



During coating