

Intelligently combined: Laser metal deposition & milling

LASERTEC 65 3D

Laser metal deposition & milling

DMG MORI machines

with integrated LASERTEC technology

Additive manufacturing for quality finished parts



LASERTEC 65 3D for quality finished parts

Laser metal deposition with integrated capability.

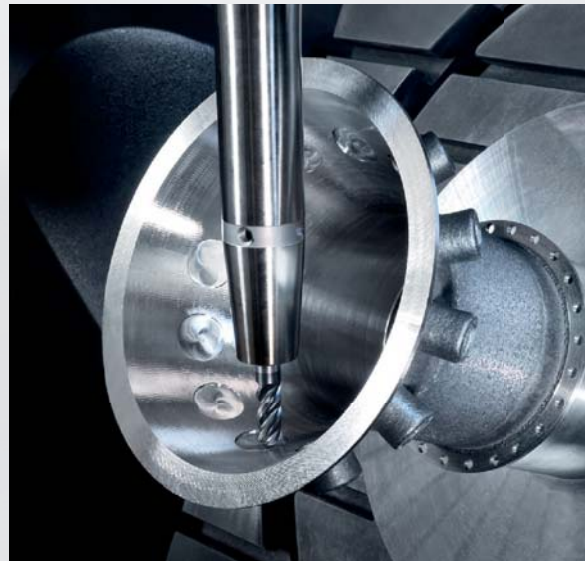
SAUER LASERTEC, a subsidiary of DMG MORI SEIKI AG, has integrated for the first time, a laser build-up method in 5-axis high-tech milling machines for impressive flexibility and precision.

Instead of using a powder bed, metal deposition is facilitated via a powder nozzle for up to 20x faster complete machining of almost any material without a process chamber. In addition, overhanging contours can be produced without any support structures. The combination of additive manufacturing and conventional milling on one machine truly opens endless application and geometry possibilities, including cost-effective production of large parts.

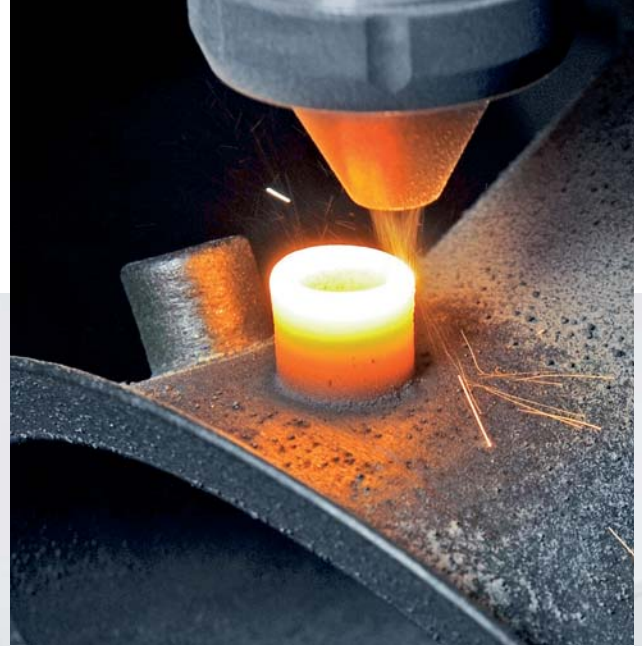
Flexible switching between laser and milling operations allows direct machining of part segments before the areas become inaccessible due to interference with subsequently deposited component geometry. It is the intelligent combination of additive manufacturing and subtractive precision machining that makes this possible.



LASER METAL DEPOSITION



MILLING

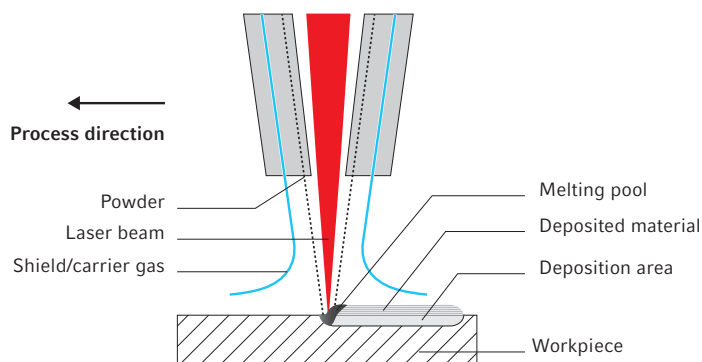


Highlights

- + Flexible additive manufacturing combined with subtractive precision milling
- + Easy switching between laser and milling operations for direct machining of part segments not otherwise accessible on a finished workpiece
- + Laser metal deposition via powder nozzle: 20x faster versus laser sintering in a powder bed
- + Complete parts production
- + 3D geometries with undercuts
- + Turbine and mold parts repairs, wear-resistant coating production

Materials

- + Stainless steel
- + Tool steel
- + Aluminum and aluminum alloys
- + Cobalt chromium molybdenum alloys
- + Bronze alloys
- + Precious metal alloys
- + Nickel-based alloys
- + Copper alloys
- + Stellite



Operating principle – Laser metal deposition

Metal powder is applied in layers to a base material and fused together while coaxial shield gas prevents oxidation during the build-up process. A high-strength fusion-bonded joint forms with the substrate that, once cooled, can be machined.

Target markets

Additive manufacturing with finished part quality for production, repair, and coating.



Complete parts manufacturing

- + Prototypes
- + Small series
- + Large parts
- + Integral parts
- + Lightweight components
- + Complex parts with undercuts

Repair

- + Tool and mold part repairs
- + Inconel turbine component repair, including blades and casings

Coatings

Partial or complete coatings (technical and wear resistant):

- 1) Mold making
- 2) Off shore
- 3) Mechanical engineering
- 4) Medical technology

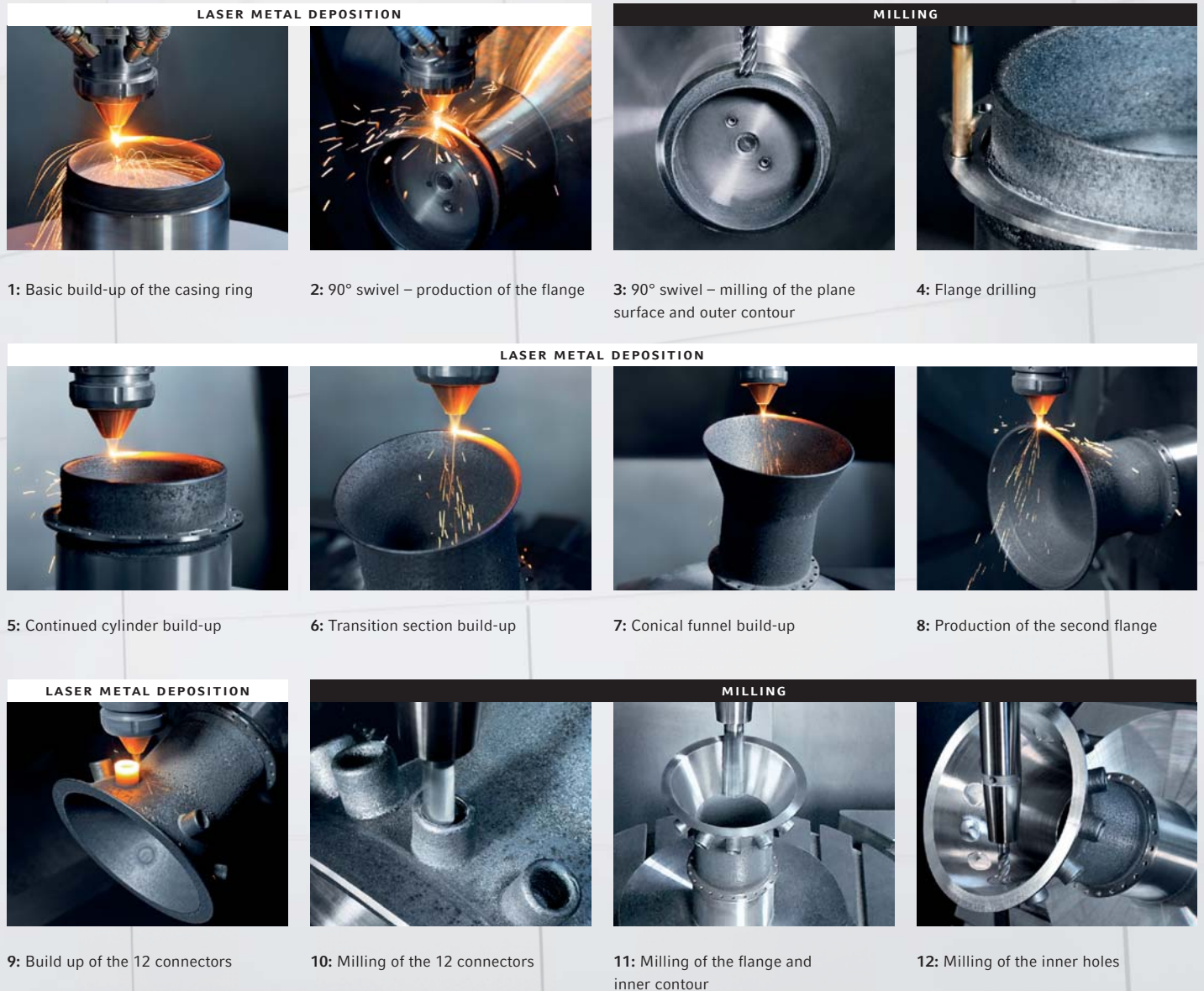
LASERTEC 65 3D highlights

- + MILL + LASER: Full-fledged 5-axis milling machine from DECKEL MAHO with a stable monoBLOCK® design; flexibly integrated laser head via an HSK interface
- + Complete machining with fully automatic switching between milling and laser operations
- + Large work area for workpieces up to ø 25.6 in., 14.2 in. high and weighing max. 2,204.6 lbs.
- + Accessibility and ergonomics: 56.3 in. door opening, optimal front access
- + Compact 80.7 ft.² footprint



Turbine casing
Material: Stainless steel
Laser metal deposition: 230 min.
Milling: 76 min.

3D component manufacturing process:



Additive manufacturing with a powder nozzle // Benefits

- + Complete machining (of almost all materials) without a process chamber for up to 20x faster production versus laser sintering in a powder bed
- + 0.004 in. to 0.2 in. wall thickness (depending on laser and nozzle geometry)
- + Overhanging contours without support geometry (e.g. flanges, cones)
- + Flexible switching between laser and milling operations for direct machining of part segments previously not accessible on a finished workpiece

Unique hybrid solution with many special features.

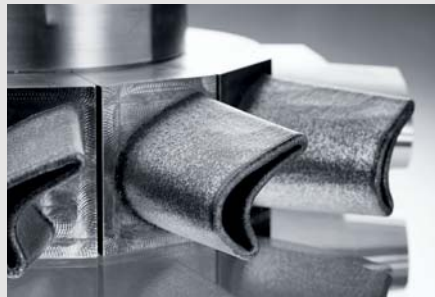
Highly dynamic machine

- + Full-fledged 5-axis milling machine with a stable monoBLOCK® design
- + Large work area for workpieces with up to \varnothing 25.6 in., 14.2 in. lengths, and weighing max. 2,204.6 lbs.
- + 56.3 in. door opening, optimal front access
- + Compact 80.7 ft.² footprint



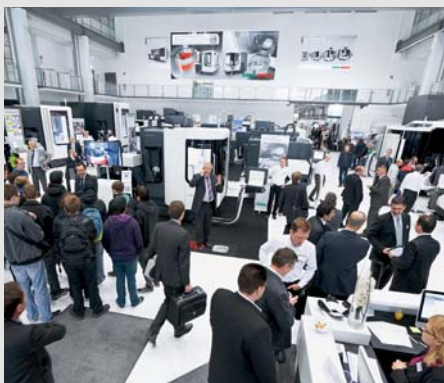
3D laser metal deposition

- + Laser head integrated via HSK interface on the spindle
- + Integrated switch mechanism in the work area
- + Laser source: 2 kW laser diode comes standard (selectable by application)
- + Automatic switching between laser and milling operations



5-axis milling

- + Milling between laser operations
- + Best surface quality & component precision
- + Components with finished part quality



Exhibitions 2014:

- September 08–13, 2014: **IMTS**, Chicago, IL, USA
- September 16–20, 2014: **AMB**, Stuttgart, Germany
- October 30 – November 04, 2014: **JIMTOF**, Tokyo, Japan
- November 25–28, 2014: **EUROMOLD**, Frankfurt, Germany

DMG MORI USA

2400 Huntington Blvd., Hoffman Estates, IL 60192
Tel.: (847) 593-5400, Fax: (847) 593-5433
info@dmgmori.com, www.dmgmori.com

DMG MORI