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LASERTEC Shape

5-axis-laser texturing of geometrically-defined
Surface structures for Mould making

DMG

MORI SEIKI

LASERTEC Surface structuring

Product mix



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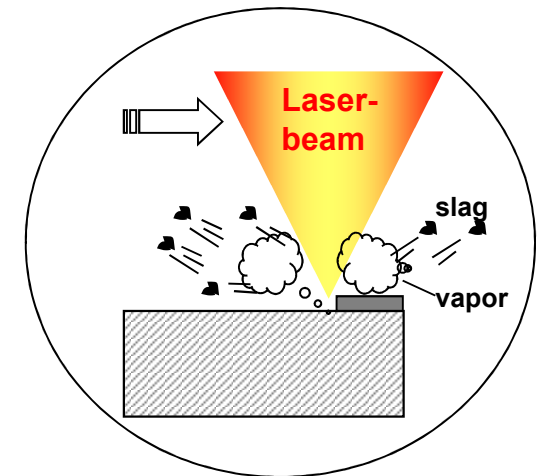
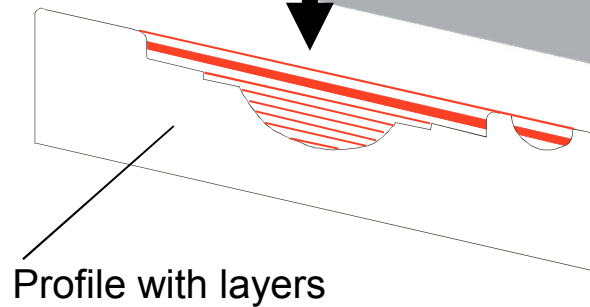
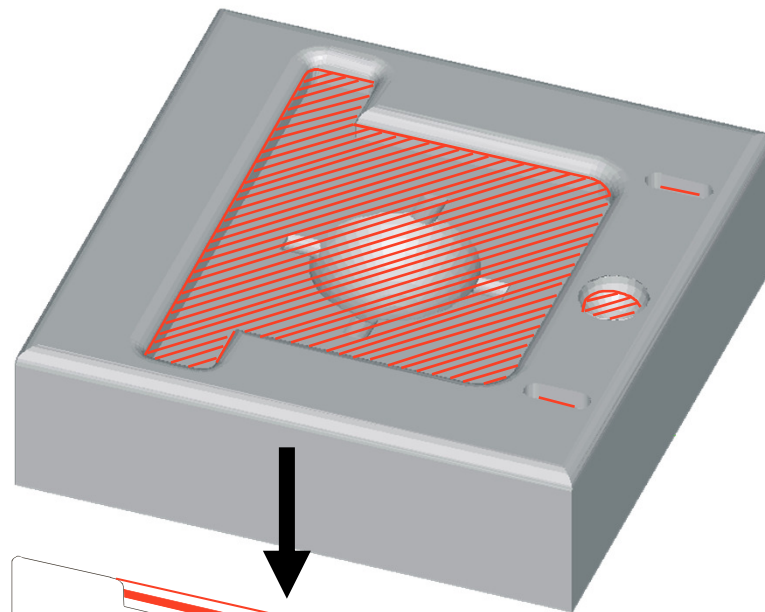
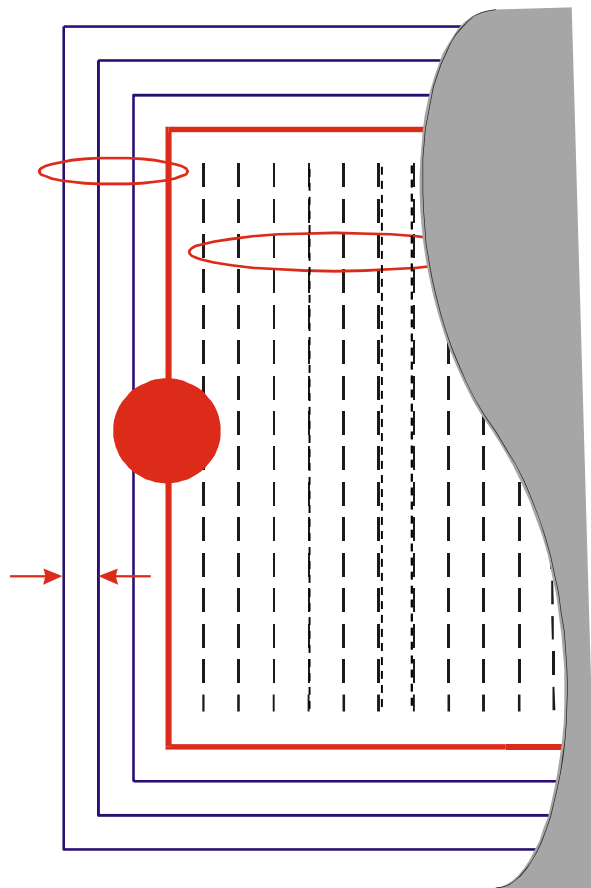


	LASERTEC 50	LASERTEC 65	LASERTEC 210
Technologies	Laser	Laser + Milling	Laser + Milling
X/Y/Z	500/500/700	650/650/650	1.800/2.100/1.250
Workpiece size	300×300×200	ø840	ø2.000×1.250
Workpiece weight	14kg	1.800kg	10.000kg

Laser ablation

Machining strategy

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Typical parameters:

Focus diameter

40 μm

Trace distance

15 μm

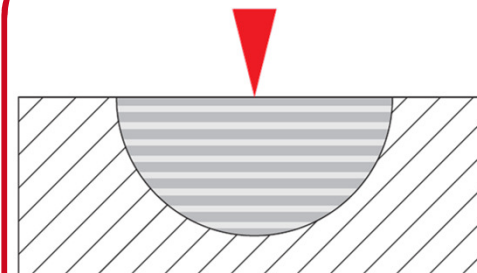
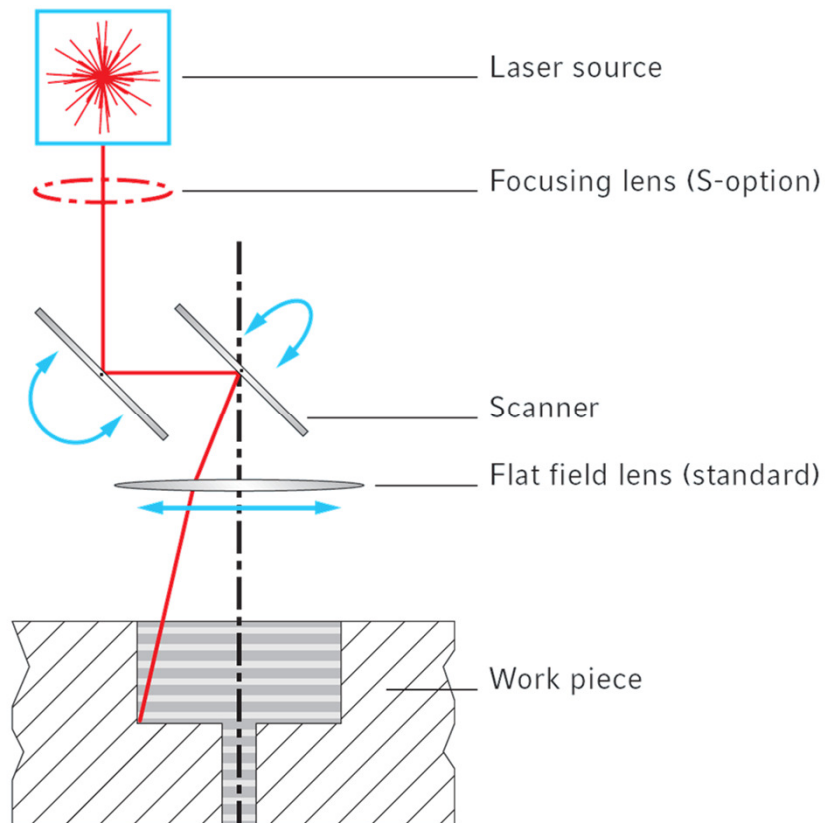
Layer thickness

0,1- 5 μm

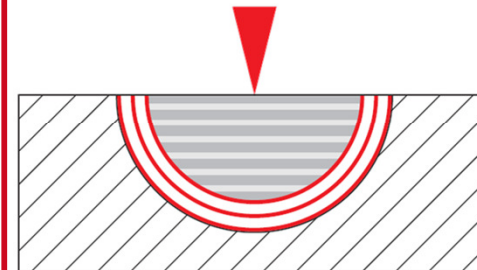
Laser ablation

Function principle / machining strategies

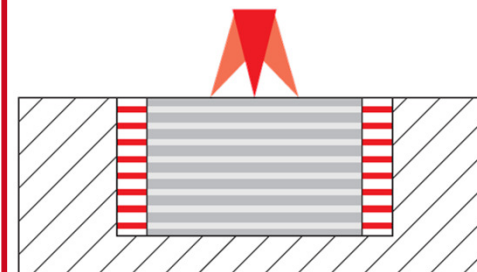
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Laser ablation in horizontal layers (layer thickness dependent on the laser and material: 0.3–10 µm)



Laser ablation with contour parallel finishing (S-option)

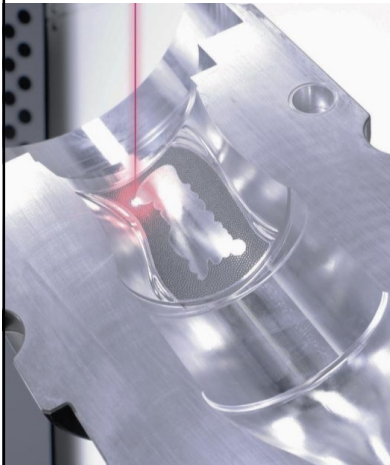


Machining with tilted laser beam for steep and vertical walls

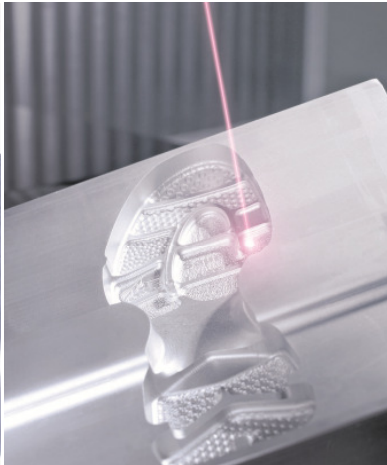
LASERTEC Shape

What is laser structuring?

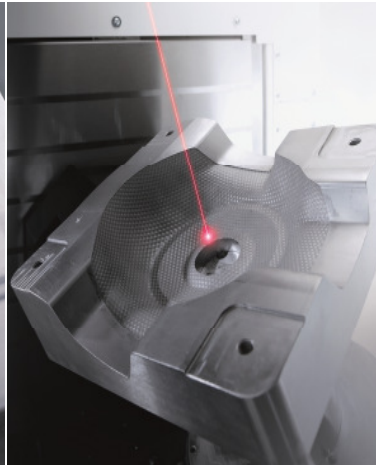
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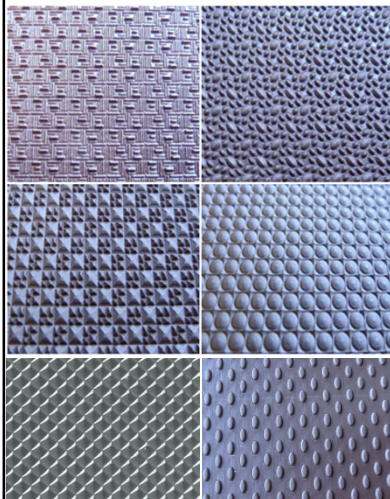
PET-Flaschenform



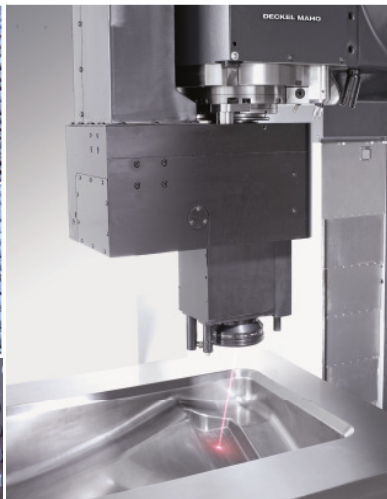
Schuhsohle



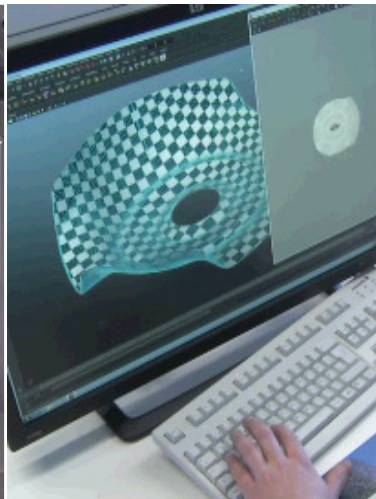
Lenkradkappe



Strukturbeispiele



Flexible Integration in
Fräsmaschinen



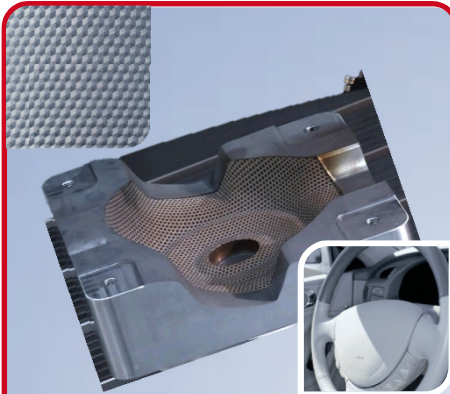
Unbegrenzte
Designmöglichkeiten

- Challenging (organical, technical) visible surface-textures in freeforms for Die & Mould
- Precise, environmentally friendly, practically, quick, cost reducing vs. conventional etching
- Absolute repeatability with highest process security
- User-friendly: customer specific, creative modeling due to intelligent, cross-process software-packages
- Flexible laser-integration into duoBLOCK® / portal-machines of DMG
- (5-axis-milling & lasering on one machine)

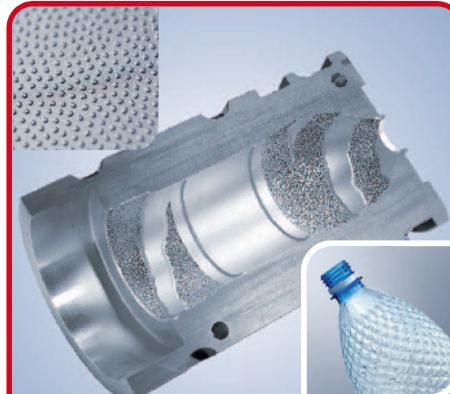
LASERTEC Surface structuring:

The most important target market segments

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1_AUTOMOTIVE



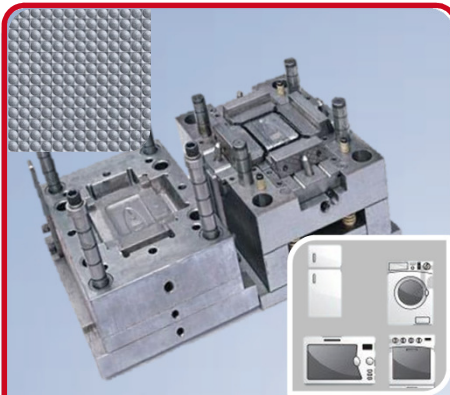
2_BLOW MOLDING



3_ELECTRONICS



4_MOBILE PHONES



5_WHITE WARE



6_OTHER INJECTION
MOLDS



7_TECHNICAL
STRUCTURES

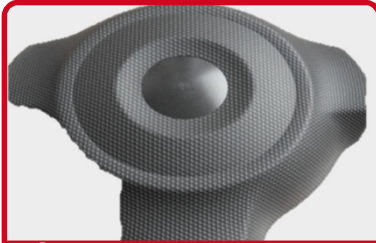


8_TEXTURING
SERVICE PROVIDER

LASERTEC Surface structuring:

Application samples

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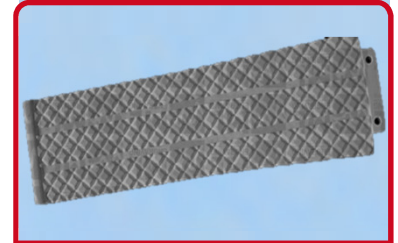
Steering wheel insignia



PET-bottle



Camera housing



Watch strap



Instrument panel



Fridge drawer



PC-mouse housing



Razor



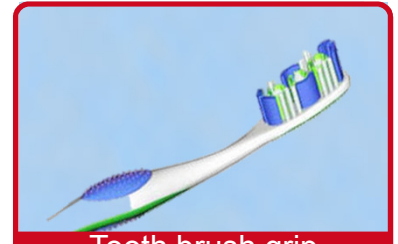
Engine cover



Tyre side profile



Mobile phone housing



Tooth brush grip



Piston with oil pockets



Shoe sole



Rifle stock cap



Rifle grip

LASERTEC Shape

Technology-Highlights (surface structuring)

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Status Quo

- **Chemical etching**
- Mainly 2D + irregular (e.g. leather structures)
- Large number of small service providers, few large providers (e.g. Standex, Eschmann)
- Structuring of a steering wheel insignia in 1 week = 2.500 € or of an instrument panel in 4 weeks = 20.000 €

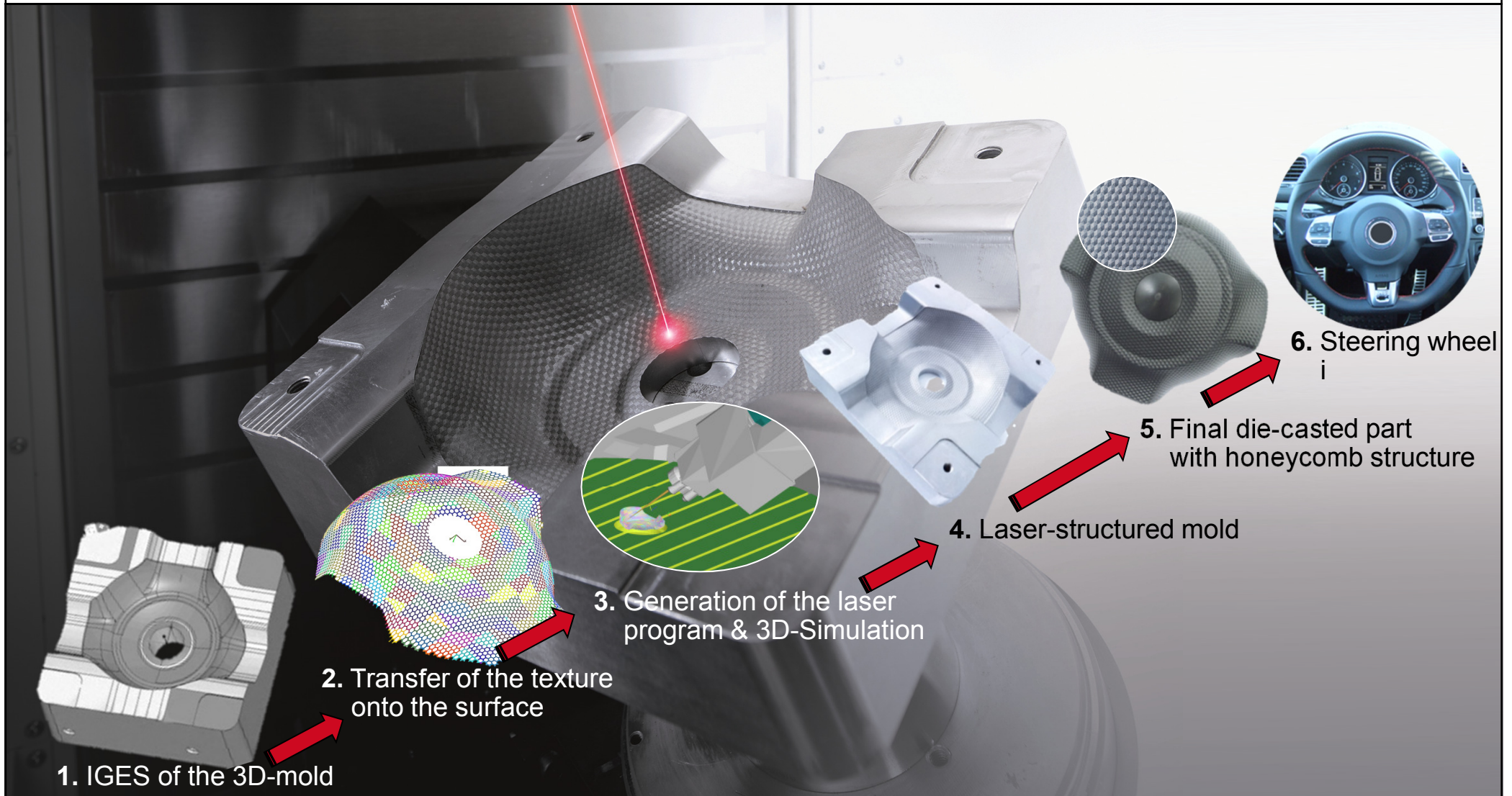
LASERTEC Shape

- **Laser structuring**
- Geometrically-defined 3D-surface-structures (new design possibilities)
- Environmentally friendly (without chemical additives)
- Fully-digitized process chain enables 3D-simulation and reproducible quality on the workpiece
- Target markets:
 1. OEM's (Automotive, Electronics, White Ware, Telecommunication)
 2. Large mold makers

LASERTEC 65 Shape

LASERTEC-3D-TEXTURE // Fully-digized process chain

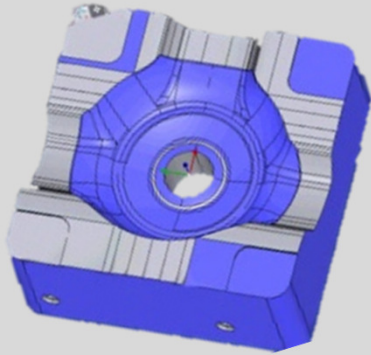
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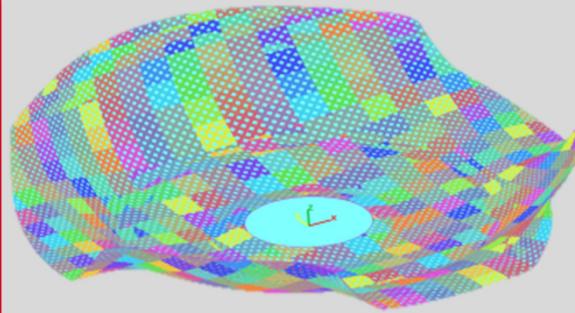
Cross-process LASERSOFT-3D-TEXTURE

Application sample: Steering wheel insignia

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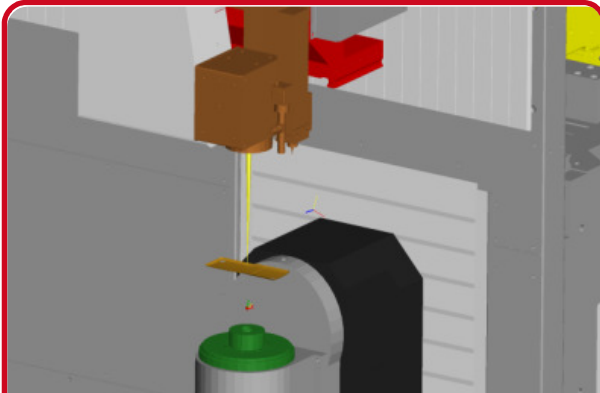
1) IGES of the 3D-surface



2) MAYA: Projection of the 3D-shape in chess pattern (Mapping)



3) Photoshop: Projection of the surface texture onto the surface



4) LASERSOFT-3D:Gen. CNC- and Laser programme & 3D-Simulation



5) 5-axis laser machining (Texturing of the honeycomb structure)

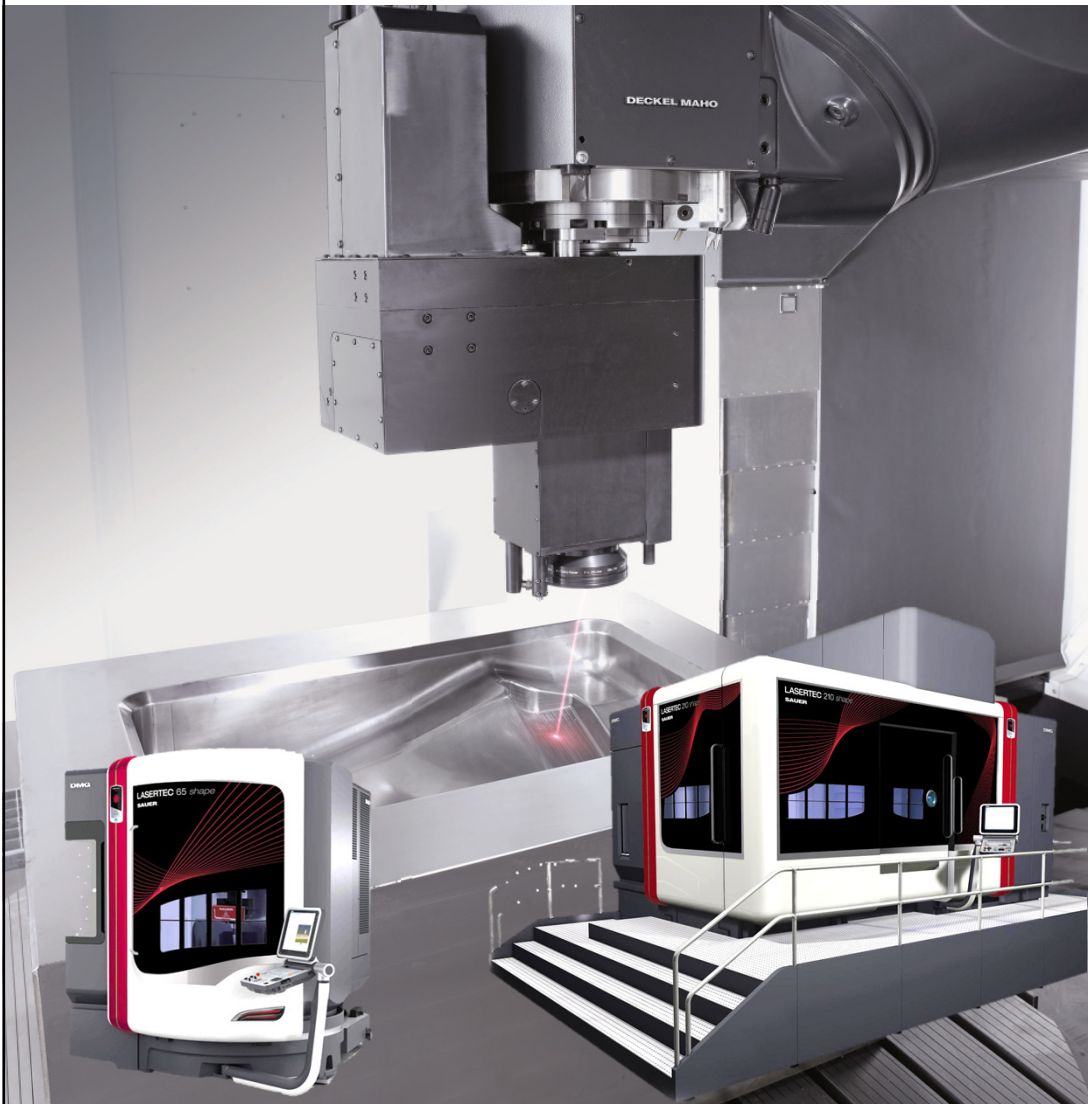


6) Lasered injection mould with casted steering wheel insignia

LASERTEC 65 / 210 Shape:

Flexible technology integration via HSK-interface

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- 5-axis-milling & laser structuring on one machine in one clamping
- Adequate 5-axis-milling machine from Deckel Maho in most stabile monoBLOCK-design
- Flexible integration of a laser head via HSK-interface
- Changeover process from milling to laser operation in appr. 5 minutes

EMO-World Premiere // LASERTEC 65 Shape Machine Highlights

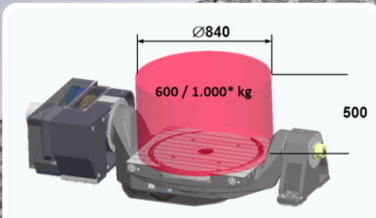
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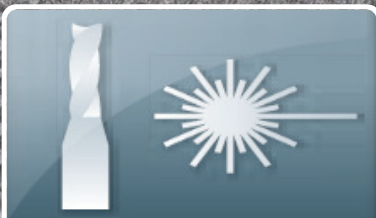
STABILITY



DYNAMICS



5-AXIS-SWIVEL/ROTARY TABLE



MILLING & LASER

- **Technology integration:** Complete machining due to **Milling & Laser ablation** on one machine
- **Flexible Adaption of the laser head** via HSK-interface
- Highly compact and rigid **monoBLOCK®- Design**
- **Optimal accessibility** due to 1.430 mm doorway and unrestricted crane loading from the top
- **Workpieces up to ø 840 mm and 1.000 kg** with 5-axis machining (3-axis: 1.800 kg)

Crane loading
from TOP



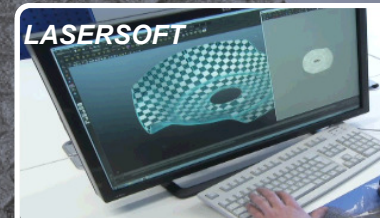
FLEXIBLE LASER-INTEGRATION



CRANE LOADING



STATE-OF-THE-ART CNC

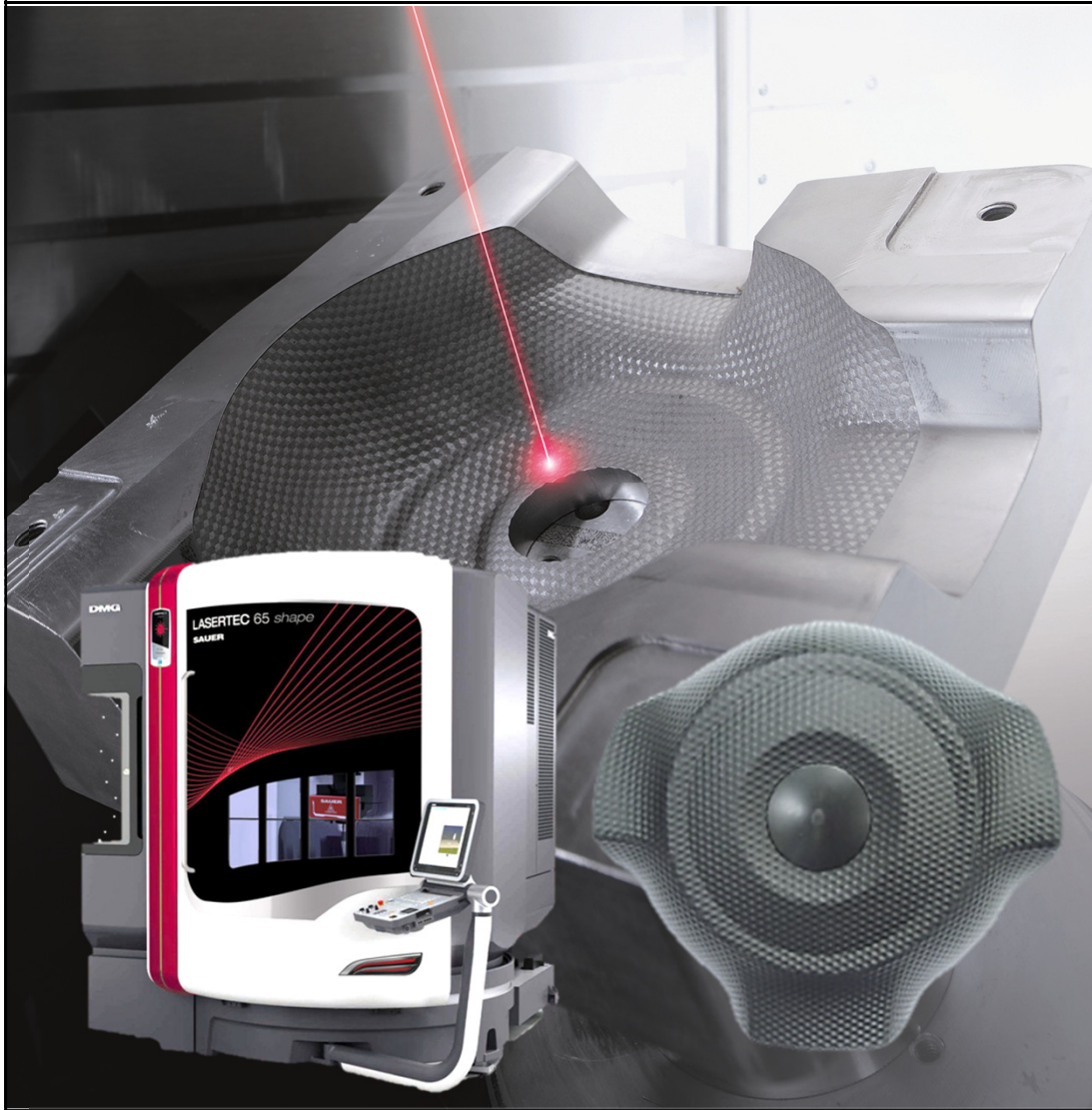


LASERSOFT-3D-TEXTURE

LASERTEC 65 Shape:

5-axis laser-structuring of a steering wheel

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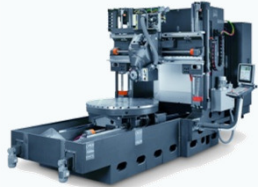
Basic workpiece data:

Part:	Steering wheel
Branch:	Automotive
Material:	Tool steel
Dimensions:	280 x 280 x 80 mm
Machining time:	30 hours (for laser-structuring of honeycomb-texture onto pre-machined mold)

LASERTEC 210 Shape (Milling & Laser)

Maschine Highlights

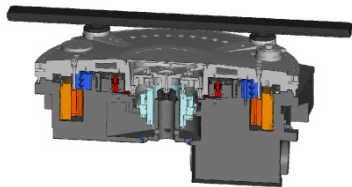
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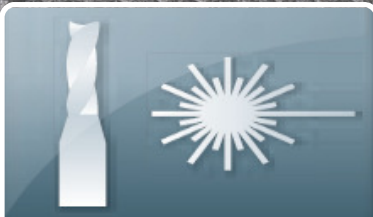
STABILITY



5-AXIS



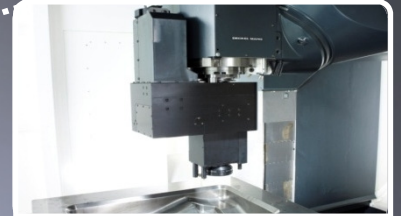
DYNAMICS / PRECISION



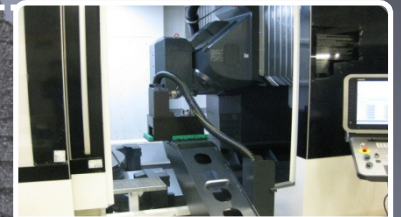
MILL & LASER

- **Portal construction** with 3- point support for highest rigidity
- **Max. positioning accuracy** due to highly dynamic torque-technology with direct drives in the B-and C-axis
- **Flexible integration of the laser head via HSK-interface**
- **Special changer device** for exchange of the laser unit
- Intelligent, cross-process **LASERSOFT-3D-TEXTURE**

Workpieces
up to 10t



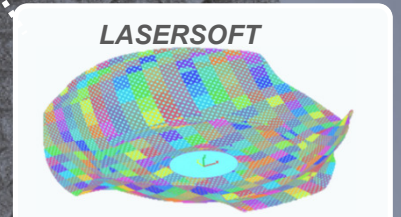
FLEXIBLE LASER-INTEGRATION



LASER HEAD CHANGER



STATE-OF-THE-ART CNC

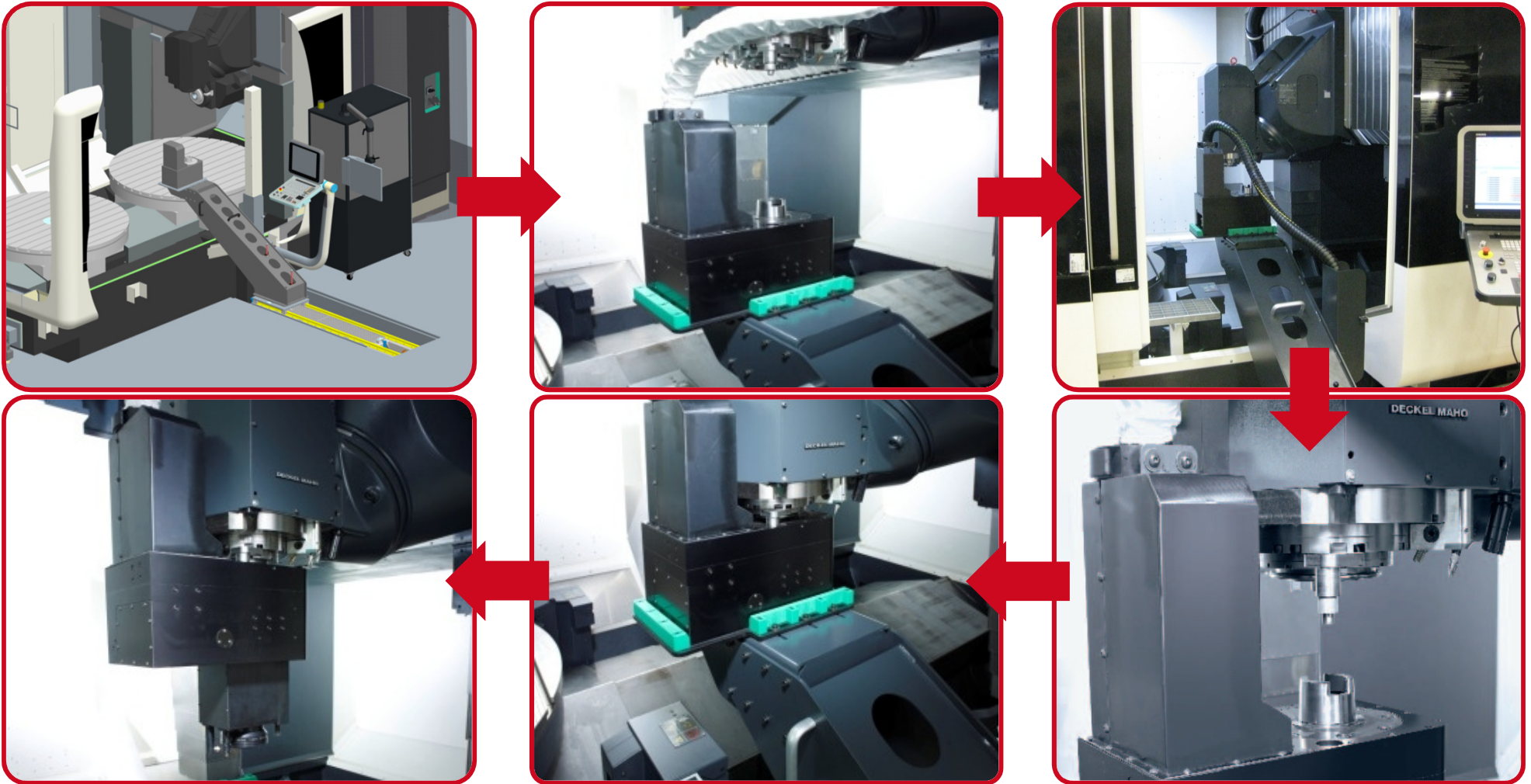


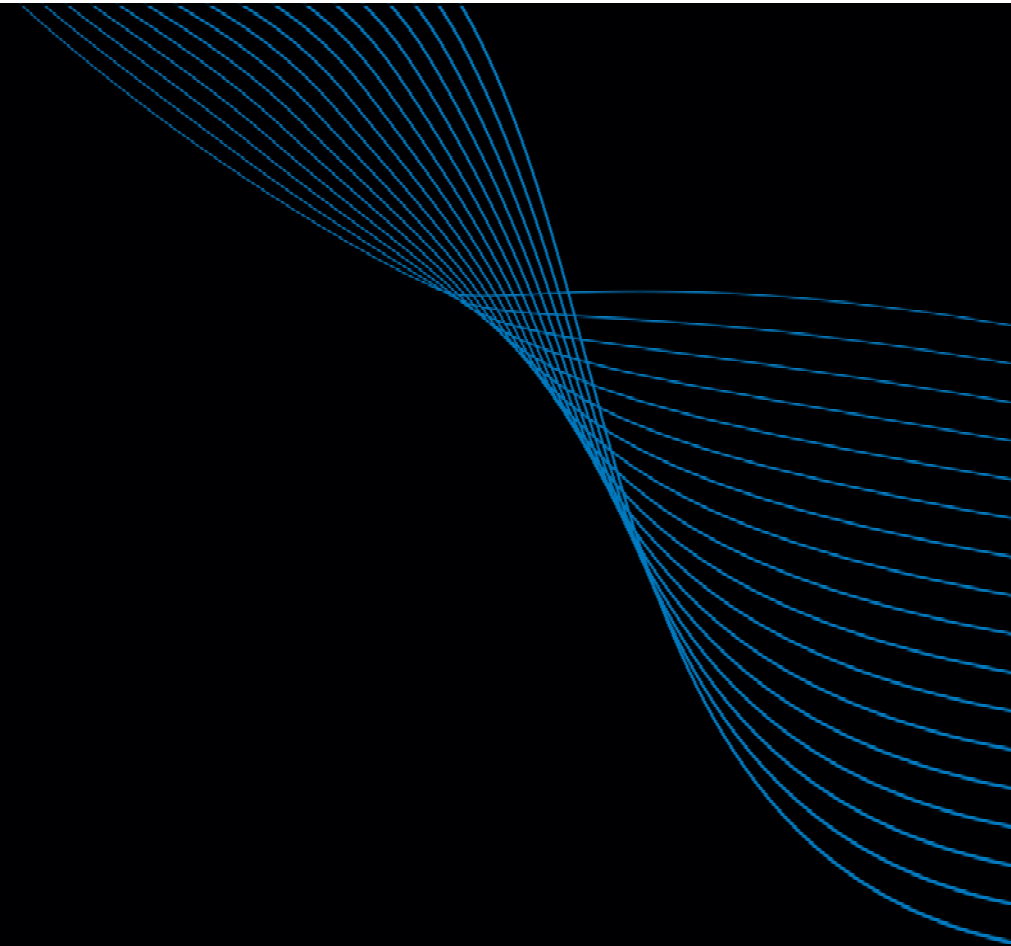
LASERSOFT-3D-TEXTURE

LASERTEC 210 Shape

Changer mechanism for the integration of the laser head

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ULTRASONIC



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Subject to modification. Technical update depicted here may include some options, equipment and CNC alternatives