



ALOtec Dresden

Laser hardening technology

ALOhard

HARDNESS AND PRECISION

ALOhard

ALOhard^{zoom}

ALOhard^{scan}



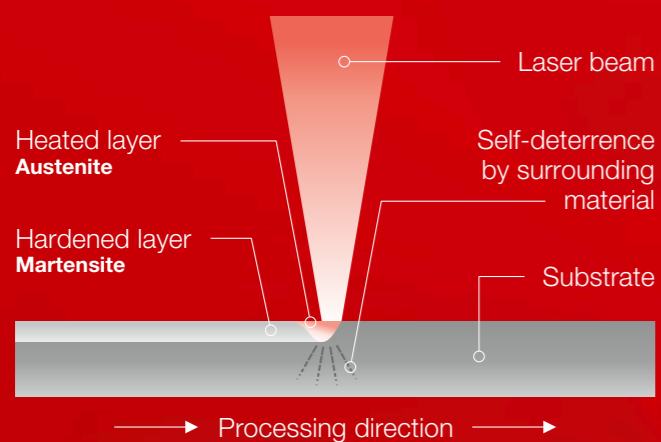
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ALOhard

Laser hardening is a surface hardening process that achieves maximum hardness values at the component surface with a very low energy input. This enables a direct improvement of the wear behaviour of components.

The laser beam briefly and precisely heats the upper area of the material, forming an austenitisation front. Due to the self-quenching effect, depending on the volume, no separate quenching medium is required and the rapid cooling leads to the formation of martensite.

Due to its technology, laser hardening is very environmentally friendly, resource-saving and very economical, especially in the area of small series and individual pieces.



ALOhard

ALOhard^{zoom}

ALOhard^{scan}

Roll it – laser on:

The laser hardening process on our Youtube channel clearly documented.



Technology for all shapes

Depending on the geometry of the component, different machining optics ensure the optimum surface hardness.

ALOhard

This processing optics **ALOhard** for laser hardening has a fixed laser track width. It is compact, light and at the same time robust in the process.

Application: Laser hardening with a fixed track width of simple serial parts used in the field of mechanical engineering as well as on tools and molds.

ALOhard^{zoom}

The **ALOhard^{zoom}** processing optics enable flexible change of the laser track width in x- and y-direction during the hardening process.

Application: Laser hardening with variable track width of geometries from a wide and changing spectrum of tool and mould components as well as parts for mechanical engineering.

ALOhard^{scan}

With **ALOhard^{scan}** we provide our clients the ultimate tool for the most demanding hardening processes. A dynamic, scan-like pendulum movement is generated via an oscillating mirror, which creates the condition for highly efficient heat field control.

Application: For all laser hardening processes, independently of the geometry of the component. Example for radii, V-grooves, multiple steps and planes, along an edge or any components geometry of parts from batch size 1 to many in tool and die industry as well as in the field of mechanical engineering.



Advantages of laser hardening

The advantages of laser hardening are convincing: high surface hardness for improved wear behaviour up to economic efficiency even for single pieces.



Laser power control for a homogeneous hardness profile



High surface hardness up to 65 HRC



Minimal distortion due to small heat input



Flexible shaping of the laser beam



Energy efficient and environmentally friendly



Time saving



Area rate up to 0.5 m²/h



No quenching media required

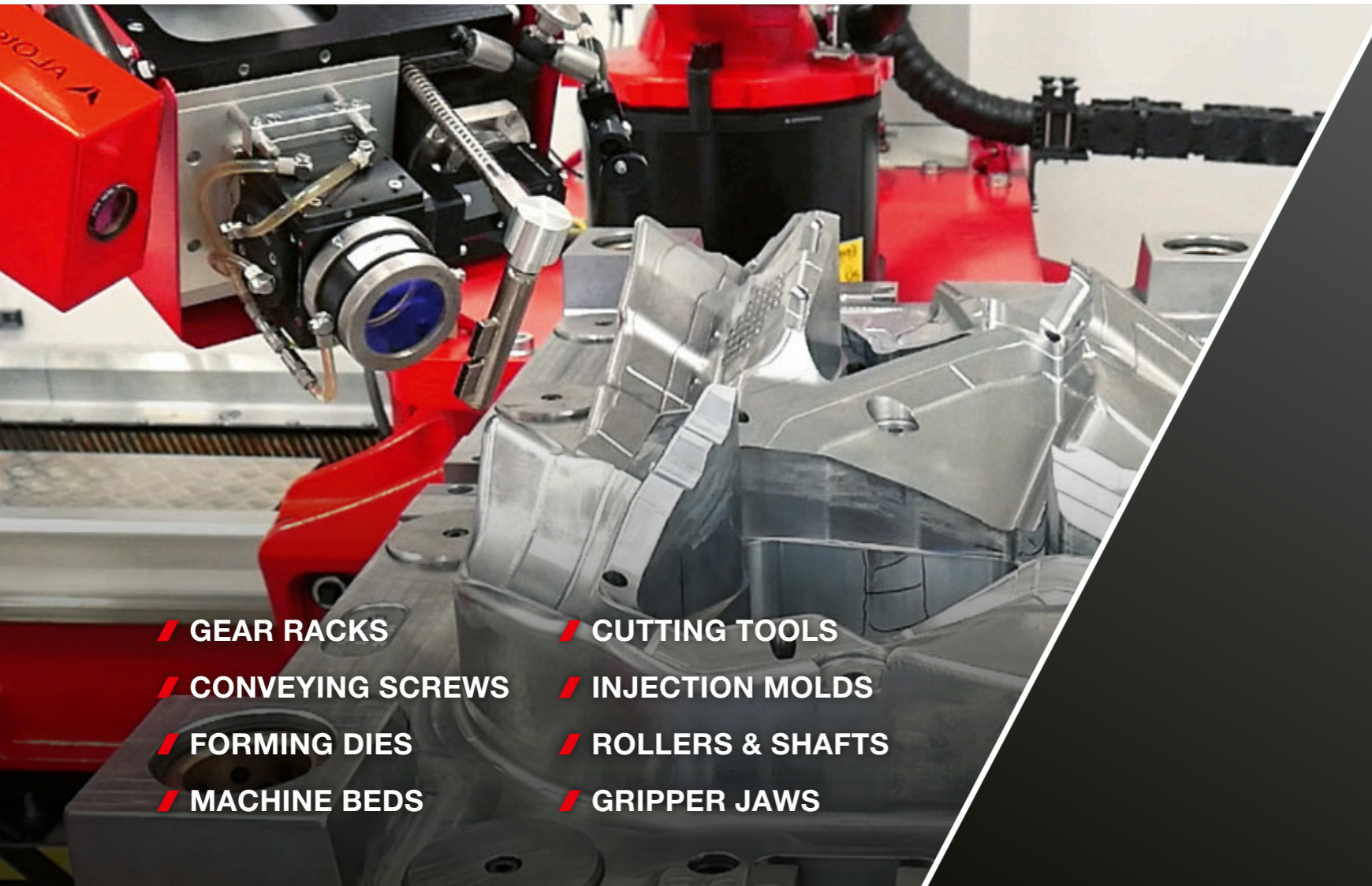


Small batches and single pieces

Mobile on site laser hardening at the component. **Just ask us!**

Applications of laser hardening

ALOhard ensures maximum hardness values on highly stressed component surfaces and is therefore an important factor for industry, mechanical engineering and toolmaking.



- /// GEAR RACKS
- /// CONVEYING SCREWS
- /// FORMING DIES
- /// MACHINE BEDS
- /// CUTTING TOOLS
- /// INJECTION MOLDS
- /// ROLLERS & SHAFTS
- /// GRIPPER JAWS

/// Application

ALOhard laser hardening is used for the finishing of highly stressed, complex components. Maximum hardness values are generated on the component surface with a low energy input. This results in a targeted improvement in the wear behaviour of heavily stressed component surfaces.

Laser hardening is used in industry, automotive, railways, mechanical engineering, toolmaking, mould making, the oil and gas industry, mining, shipbuilding and agriculture.

Examples for laser hardening

Due to our different optics, we can process all components regardless of their geometry.



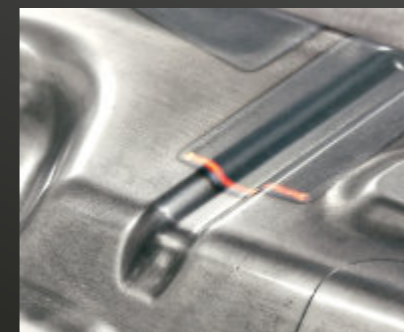
Laser hardening ALOhard^{zoom} of a gear rack



Laser hardening ALOhard on a cutting tool



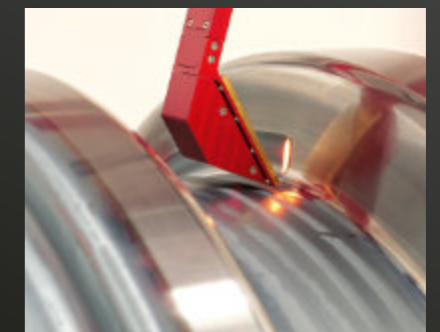
Laser hardening ALOhard on a bending tool



Laser hardening ALOhard^{scan} of a drawing die



Laser hardening ALOhard on a machine component



Laser hardening with mirror system on a roller



Laser hardening of a surface with ALOhard^{scan}



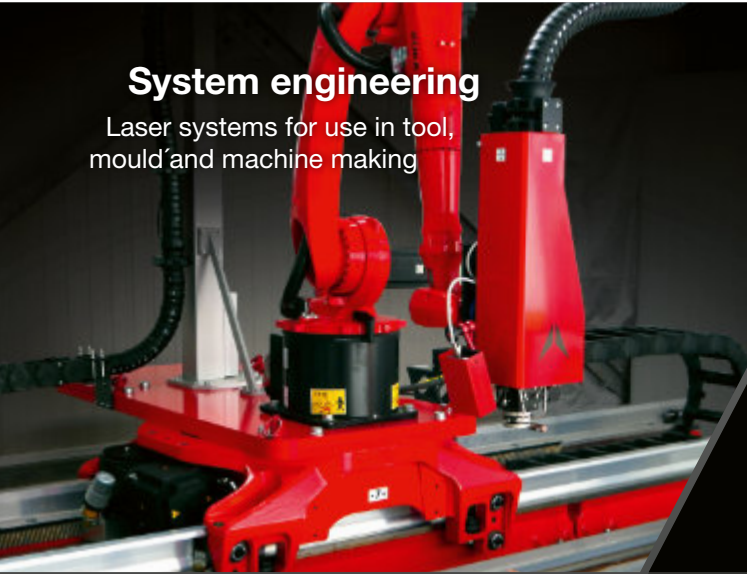
Laser hardening of a bevel gear with ALOhard^{zoom}



Laser-hardened turned part with surface hardness 60 HRC

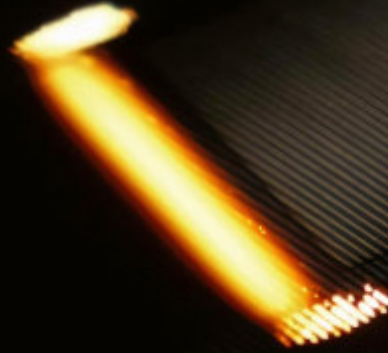
System engineering

Laser systems for use in tool, mould and machine making



Contract manufacturing

Laser hardening, repair and coating as well as additive manufacturing



ALOTec Dresden is a high-performance technology partner for the metalworking industry specialised in the manufacture of customized and turnkey robotic systems for laser hardening and laser cladding for over 25 years.



In addition, **ALOTec Dresden GmbH** offers services in the fields of laser hardening and laser cladding with powder or wire (Job-Shop-Production). These laser material processes can also be carried out – through the innovative **ALOflex** system – on-site at the customer's premises.

ALOTec Dresden GmbH

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25 YEARS
ALOTec Dresden