



ALOtec Dresden



Robot system for mobile laser processing

ALOflex

FLEXIBILITY AND MOBILITY

ALOhard

ALOpowder

ALOflex

ALOflex



ALOflex

ALOflex.de

10 good reasons

The mobile laser processing system ALOflex offers many good reasons for its use in laser hardening, repair and coating.

Up to 10 kW
laser power.

1

Smallest size and footprint

- Fits comfortably on a Euro pallet
- Easily passes through a standard 90 cm door
- Minimal footprint in the workspace

2

Drive control that is fun for everyone

- Innovative wireless remote control
- Easy maneuvering in tight workspace
- Operation from a clear and secure position

3

Flexibility – we reinvented

- Use on a crawler track
- Use directly on a workpiece
- Use as a stationary system

4

Protection of sensitive components

Sensitive components are relocated to the mobile media station for their protection. An added benefit: a compact, maneuverable laser system!

5

10 kW laser power

Because it sounds incredible for a mobile laser system, we're happy to spell it out: **Ten kilowatts of laser power** is achievable with our system!

6

Up to 10 synchronized axes

Up to 8 synchronized axes for mobile applications and up to 10 axes for use as a stationary laser system on a linear unit.

7

Laser what you desire

- Laser hardening with zoom or scanning optics
- Laser cladding with powder or wire for exterior and interior coatings (powder)
- Arc welding

8

Operation can also be simple

- Easy operation through predefined macros (programming assistant)
- Laser power control using E-MAqS thermal imaging camera and LompocPro control

9

With us, you can go the distance

Ingenious transport concept for the laser system and accessories, designed for optimal sizing for transport by truck, ship, or aircraft.

10

Safe, Safer, ALOprotect⁵

The ALOprotect⁵ laser safety barriers are certified by Prof. Klaus R. Göbel and achieve a protective exposure limit (E86) of 13.8 MW/m².

Greatest flexibility – smallest dimensions.

ALOflex is the most flexible laser processing system for laser hardening, laser cladding, and CMT welding.

The ALOflex flexibility concept

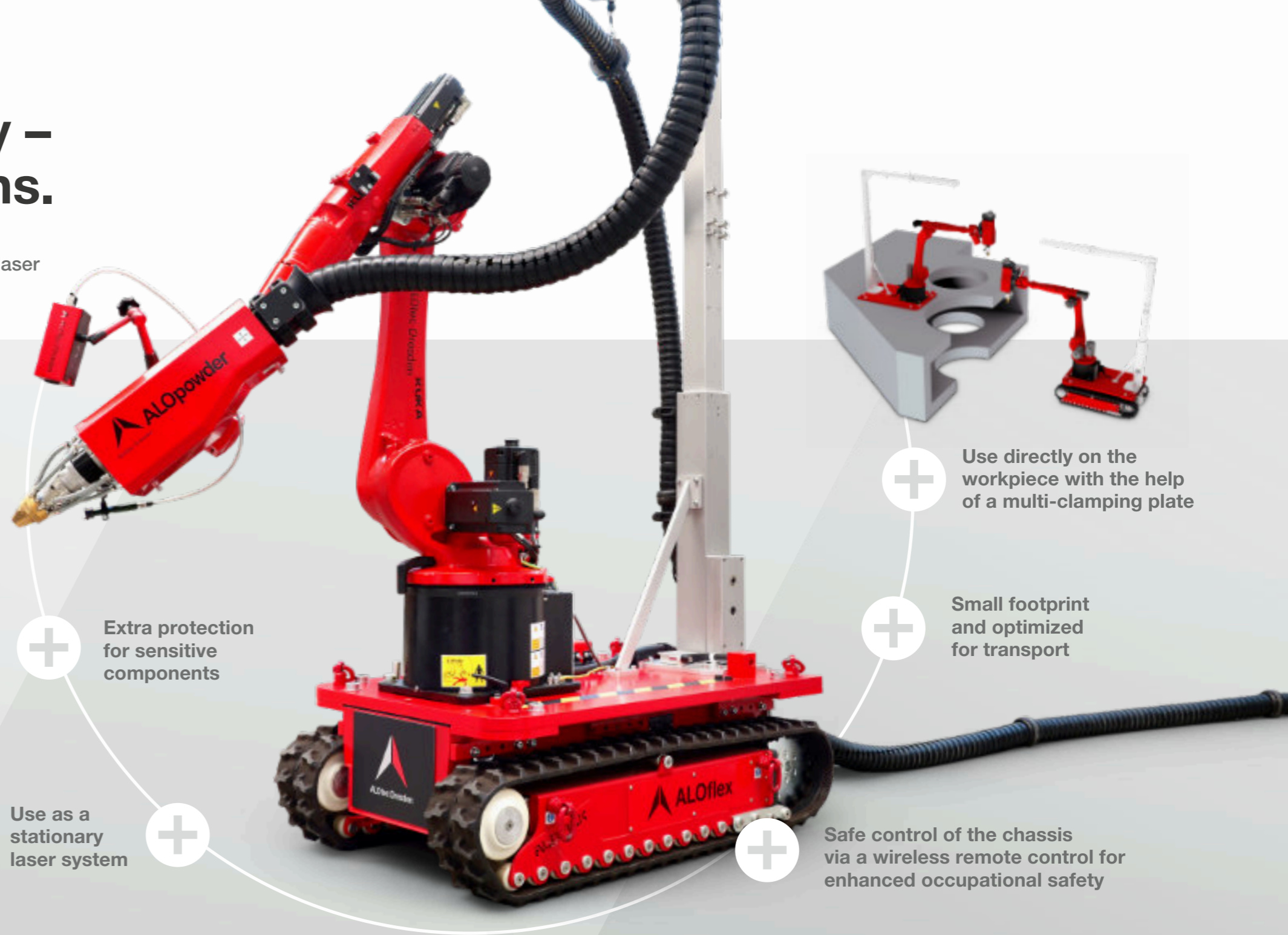
With our mobile laser system **ALOflex**, we have deliberately chosen to relocate sensitive components to the mobile media station.

Dust-sensitive components such as coolers, PCs, lasers, and monitors are not directly exposed to laser operation and are therefore comprehensively protected. This design allows the chassis with the robot to be kept light, compact, agile, and flexible, unlike any other mobile laser system.

The robot is connected to the media station via a 15-meter-long, flexible energy chain and has a large, mobile working area.

Another advantage of **ALOflex** is the ability to detach the robot from the crawler track and use it directly on a workpiece or on a linear unit as **ALOhybrid**, combining the benefits of a stationary laser processing system.

ALOflex – simply flexible and mobile!



Fits on a Euro pallet
800 x 1,200 mm



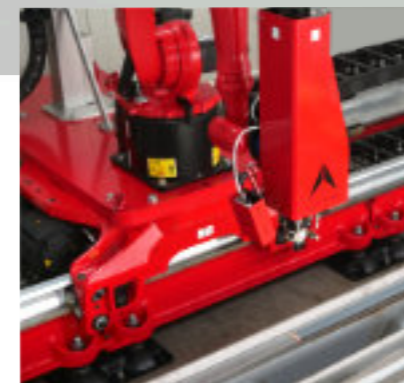
Fits through a 90 cm-wide
door or narrow spaces



Positioning directly
on the workpiece



High occupational safety
through intuitive remote control



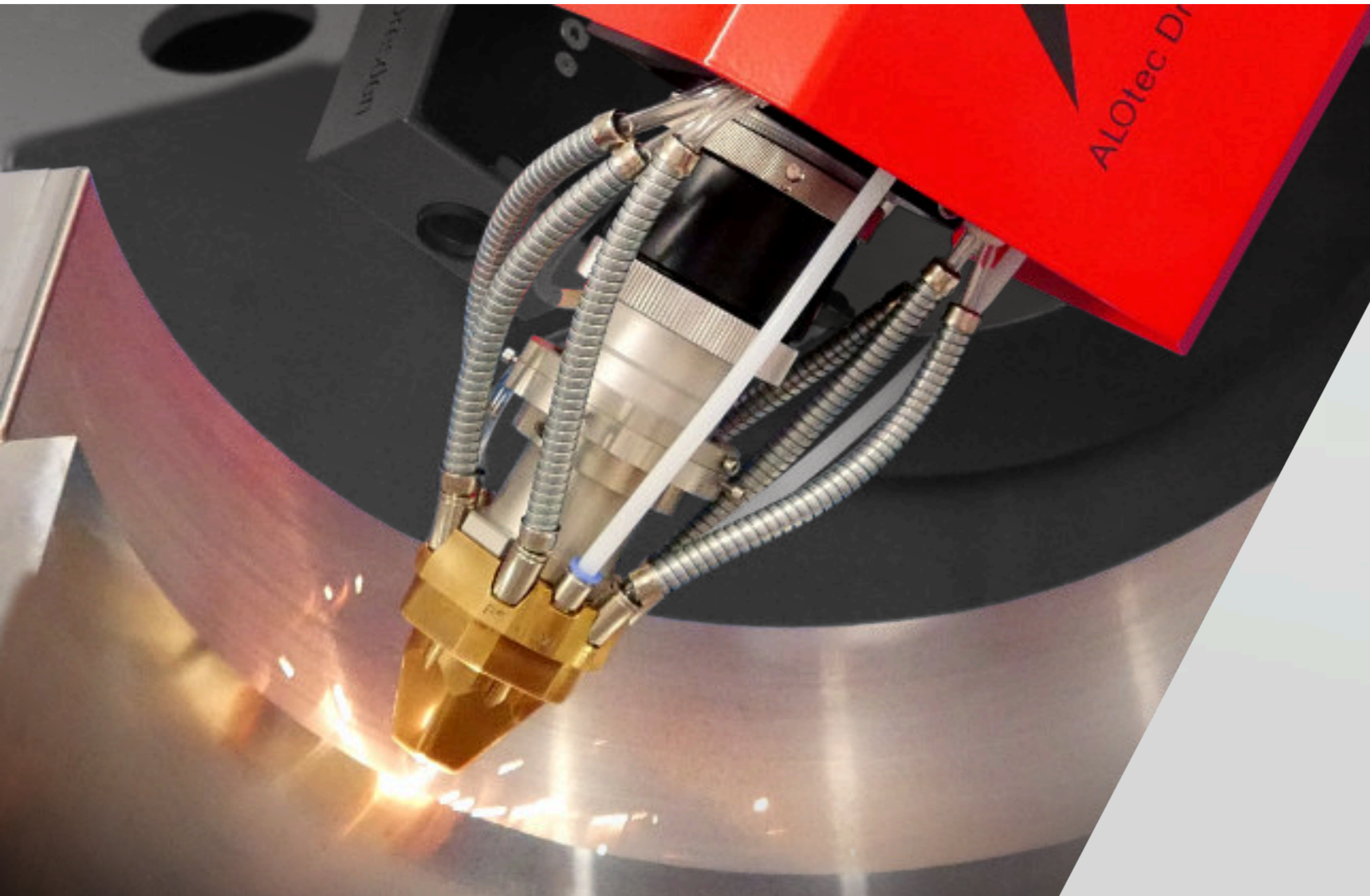
Can be used as ALOhybrid
on a linear unit



Large mobile working area thanks
to a 15 m long energy chain.

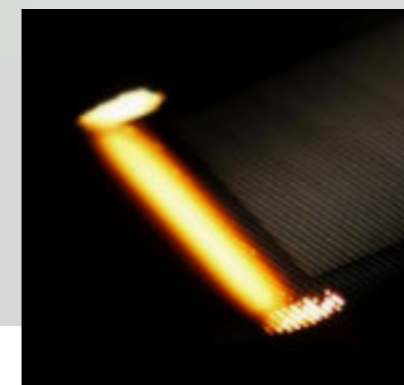
Various Applications.

Specific hardening of metallic surfaces and repair or reconditioning of heavily stressed components in mould, tool and machine construction.



ALOhard, ALOhard^{zoom} Laser hardening with variable track width

- For maximum hardness values on the component surface
- Improvement of wear behavior



ALOarc Arc welding (CMT)

- Specially suited for high deposition rates
- For coating and joint welding



ALOpowder Laser powder cladding

- Application of wear-resistant coatings on components
- Rapid modification of component geometries



- Laser hardening **ALOhard** and **ALOhard^{zoom}**, laser powder cladding **ALOpowder**, and CMT welding **ALOarc** in mold and tool making, as well as mechanical engineering
- Specific hardening of metallic surfaces and repair or reconditioning of heavily stressed components
- Suitable for processing forming tools, machine parts, cutting tools, or screw conveyors, bearing seats, rollers, and more

Hardening, repairing, and cladding - 25 years of experience in laser material processing ensure the highest quality in system engineering and with our technologies **ALOhard** and **ALOhard^{zoom}** for laser hardening, **ALOpowder** for laser powder cladding and **ALOarc** for CMT welding.

Additional applications can be optionally employed: laser powder cladding with interior cladding optics* **ALOpowder^{IP}**, laser wire cladding* **ALOWire**, hardening with dynamic scanning optics* **ALOhard^{scan}**, and a hybrid technology combining wire and powder cladding* **ALOTwin**.

*For these applications, modules of the mobile laser system need to be adjusted.

Modular equipment.

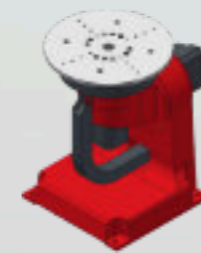
The ALOflex system can be customized with additional components from the modular equipment.



6-axis robot and crawler track with remote control



Processing optics



Turn-tilt axis for up to 8 axes



Mobile media station



Mobile, certified safety barriers



Mobile station for laser safety barriers, robot with crawler track, accessories and tools

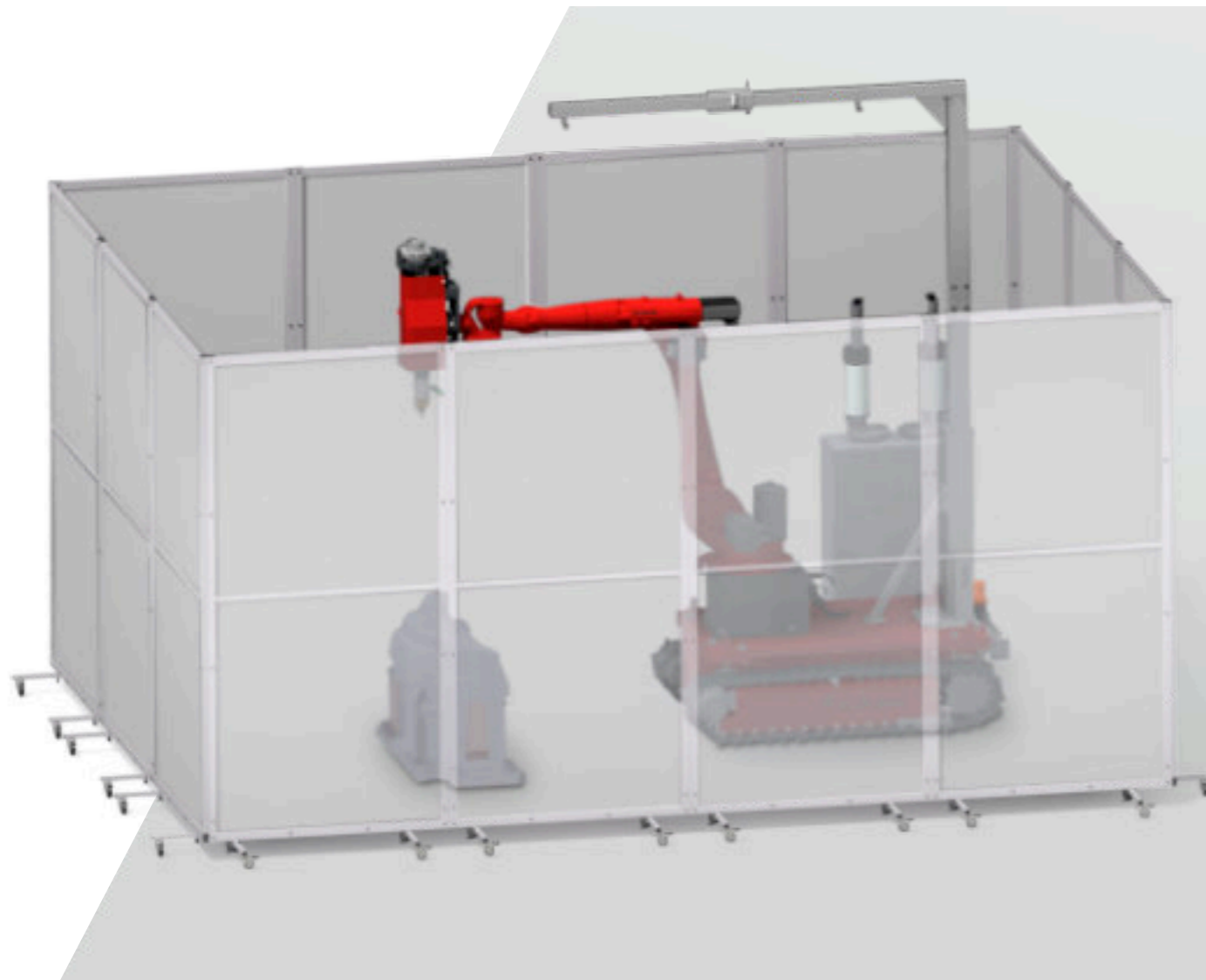


Mobile station for laser module, cooling, powder conveyor, energy chain and control

- /// 6-axis robot on a crawler track with remote control
- /// Processing optics with high-power diode laser up to 10 kW
- /// Mobile media station and mobile certified laser safety barriers
- /// Optional: Turn-tilt table (2-axis) for up to 2.6 tons for part positioning

Excellent laser safety concept.

Our ALOtec laser safety barriers are certified, modular, easy to assemble and simple to store and transport.



ALOprotect⁵ – the innovative laser safety wall concept

The laser safety walls are flexible, intuitive, and quick to set up, and they can be safely and compactly stored through the mobile station. The mobile station is optimized for transport by road, rail, and air freight in terms of dimensions and structure.

The time required for setting up the certified laser safety walls and installing the associated technical accessories such as door monitoring, emergency stop switches, and laser warning lights is minimal and takes only 1 hour.

ALOprotect⁵ – naturally laser-safe

The ALOprotect⁵ laser safety walls have been tested and certified by the renowned engineering office of Prof. Klaus R. Göbel.

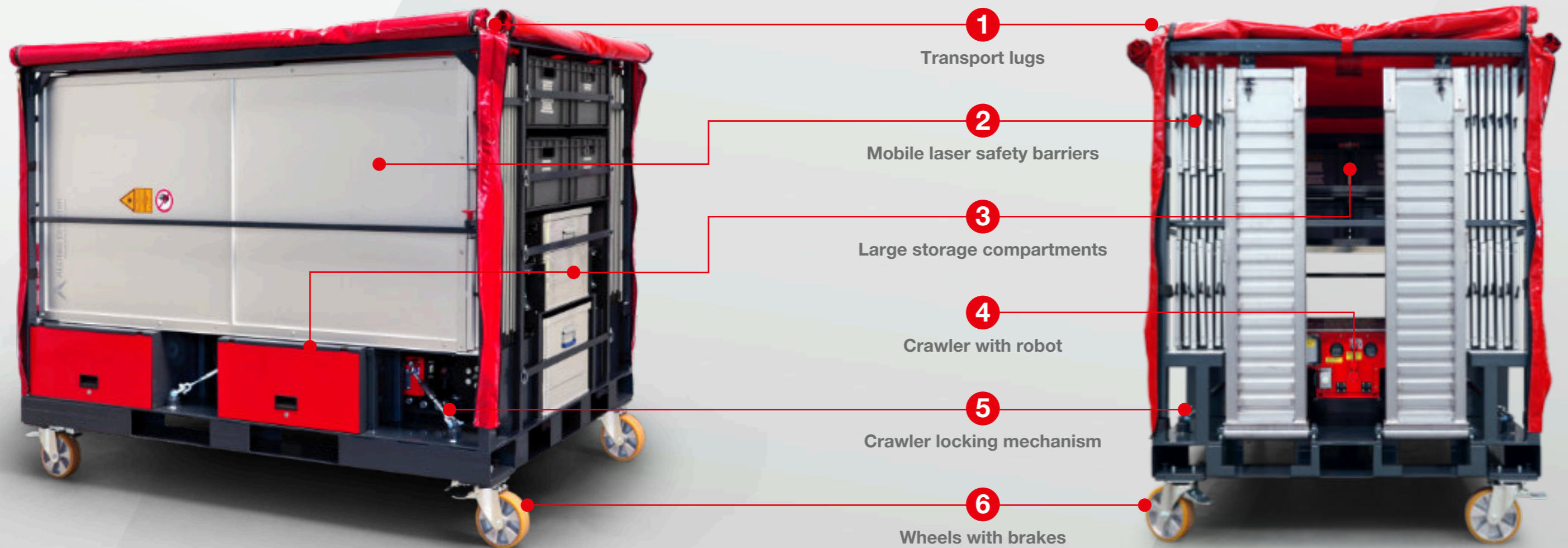
ALOprotect⁵ achieves an unprecedented protective exposure limit (E_{86}) of 13.8 MW/m² for a passive, mobile laser safety wall.

With ALOprotect⁵ you work safer.

Optimized for all routes around the world.

When mobile, even during transport! Our mobile laser system, ALOflex, is optimized for all modes of transportation, whether by truck, train, ship, or air freight.

- /// Compact and standardized dimensions of the stations
- /// Mobile stations transportable with a forklift
- /// Mobile stations with lugs for crane suspension
- /// Mobile stations with modular wheels for easy maneuvering



Crawler with robot: Space for the mobile laser system with 2 sturdy loading ramps and a secure locking mechanism for a safe transport

Storage compartments for processing heads, tools, and accessories: 2 dustproof boxes for processing heads, 4 boxes for laser safety accessories, and 4 lockable compartments for tools and accessories

Transport lugs for safe loading and unloading, as well as relocation to a second level

Wheels with brakes for quick relocation and removable during transport



Optimized for truck transport



Meets the specific airfreight dimensions



Optimized for transport by ship



Optimized for transport by train

The excavator calls – the ALOflex is on its way!

Mobile laser cladding in mining – our mobile laser system ALOflex is ready to showcase its capabilities.

- ✓ No time- and cost-intensive remanufacturing of the component
- ✓ No time-consuming transport
- ✓ No long production downtime



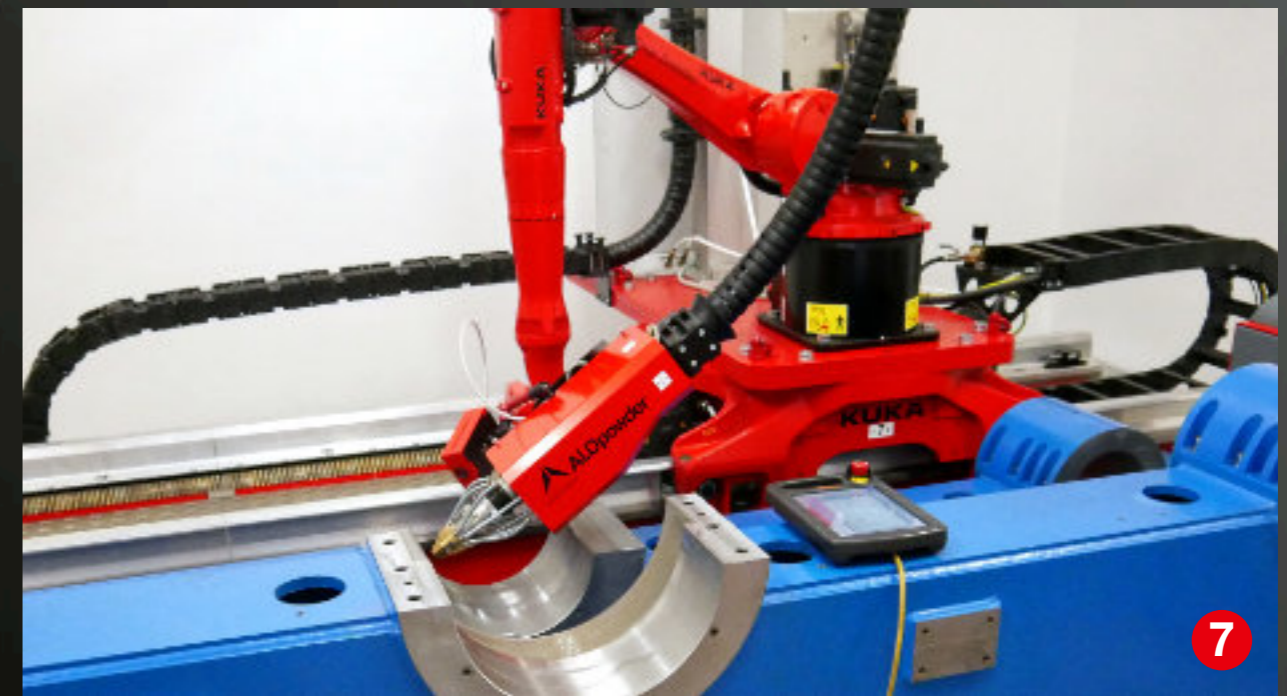
The use of the ALOflex mobile laser system in mining

Mining is known for heavy machinery. Repairs are inevitable due to the high stress on the equipment. However, extended downtime of mining facilities can be cost-prohibitive. This is where our mobile laser system, **ALOflex**, came into play. It was easily loaded and transported swiftly. Thanks to its compact size and manoeuvrable crawler chassis, it could be driven directly to the gearbox housing. The 6-axis robot efficiently reached the component geometry for welding. Integrated process monitoring ensured a high-quality weld structure at the bearing seats.

- 1 Transport of the mobile laser system**
The **ALOflex** is optimized for transport, making it quick to load and easy to transport.
- 2 Setting up the mobile laser system**
The **ALOflex** is positioned and set up on-site at the component.
- 3 Setting up the control and laser safety barriers**
The laser safety barriers are erected around the component, and process monitoring is established.

Repair of multiple bearing seats in the gearbox housing of an excavator

- /// Total weight of the gearbox: approximately 80 tons
- /// Dimensions of the gearbox to be machined: 5 x 4 x 1.5 meters
- /// Diameter of the largest bearing seat: 1.7 meters
- /// Longest cladding length on a bearing seat: approximately 262.2 meters
- /// Customer's timeframe: a maximum of 4 days for setup, preparation, cladding, and disassembly.



4 Fully set up mobile laser system
The **ALOflex** and the powder conveyor positioned in front of the component and ready for operation.

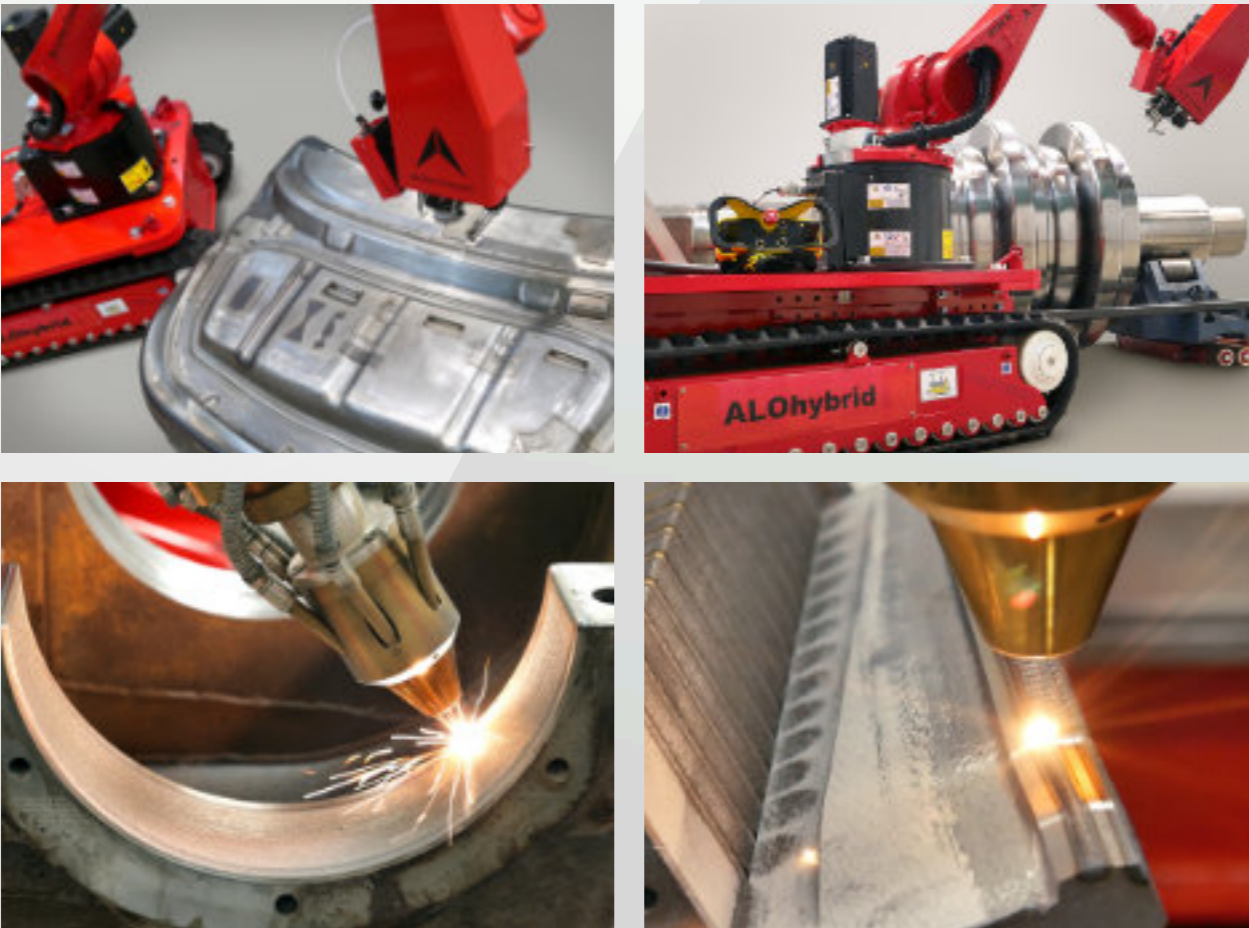
5 Process monitoring during cladding
Capture of the process camera during laser powder cladding on the component directly on-site.

6 Fully cladded bearing seat
Cladding pattern as a meandering track on a bearing seat with a track width of 3.8 mm and a layer height of 1.0 mm. 1.4404 CrNi steel was used as the filler material.

7 The ALOflex after the repair operation as a stationary system in contract manufacturing
Following the mobile repair operation on-site at the component, the laser system was mounted on a linear unit and operated as a stationary 10-axis laser system at **ALOftec Dresden** in the contract manufacturing field for laser hardening and laser cladding.

Your advantages – flexible and mobile.

With the ALOflex you get flexibility for a mobile use and the possibility to use it as a stationary system.



Technical highlights.

We design and build your customized mobile laser system for hardening, cladding (powder and wire) or CMT welding.

CONNECTION

- Power supply: 400 V / 50 Hz / 32 A (depending on system configuration)
- Compressed air supply: 6 bar
- Shield gas: Argon 7 bar

ROBOT

- 6-axis robot
- Reach: from 1.8 m
- Payload: from 20 kg

LASER

- Fiber-coupled high-power diode laser
- Laser power: up to 10 kW
- Wavelength: 900 – 1,080 nm

OPTICS

- Hardening (ALOhard^{zoom}): Zoom optics 5 mm – 40 mm (2D zoom optics)
- Welding (ALOpowder): Spot size approx. 3.6 mm
- CMT welding (ALOarc)

PERIPHERALS / ACCESSORIES

- Laser power control
- Line scanner
- 3D probe
- Modular mirror system (ALOhard^{zoom})

SOFTWARE

- Software for laser power control
- Offline programming software
- Macros (programming assistant) for easy operation
- Scan software for 3D surface digitization

- 1** Up to 8 axes with one control and user-friendly operation (Up to 10 axes when used as a stationary ALOhybrid system)
- 2** Rapid technology switch between laser hardening, laser cladding and CMT welding via quick-change system
- 3** Continuous documentation of process parameters

- 4** Easy positioning on the workpiece using the crawler track and remote control
- 5** Offline programming via CAD/CAM and surface geometry scanning for path planning (optional)
- 6** Versatile transportation options (road/rail/water/air)

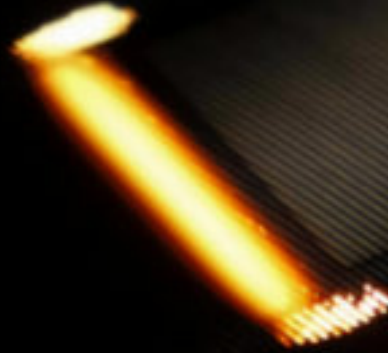
System engineering

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