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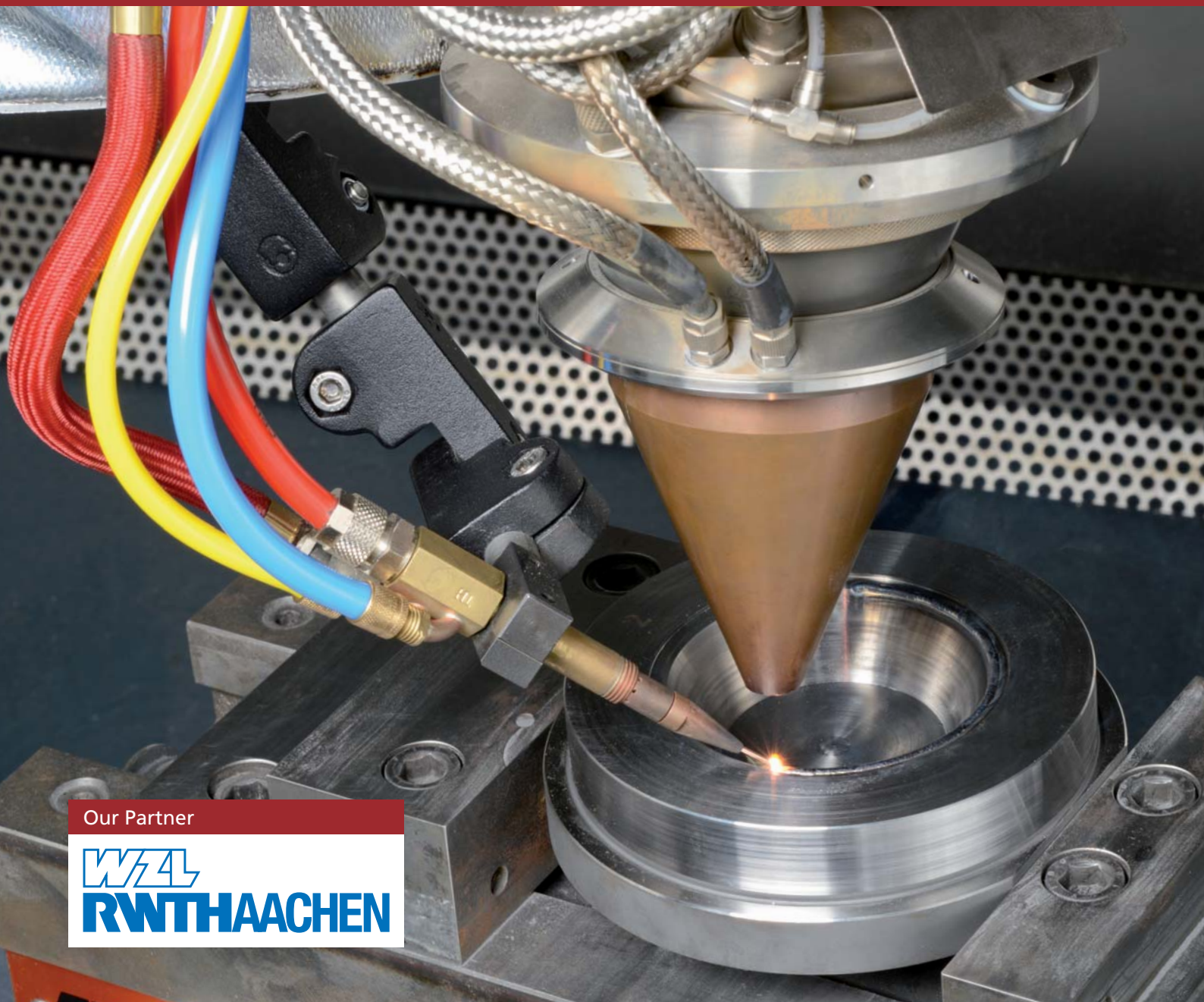
FRAUNHOFER INSTITUTE FOR PRODCTION TECHNOLOGY IPT

ADDITIVE MANUFACTURING – REPAIR, BUILD UP AND GEOMETRICAL MODIFICATIONS BY LASER DEPOSITION WELDING



Our Partner

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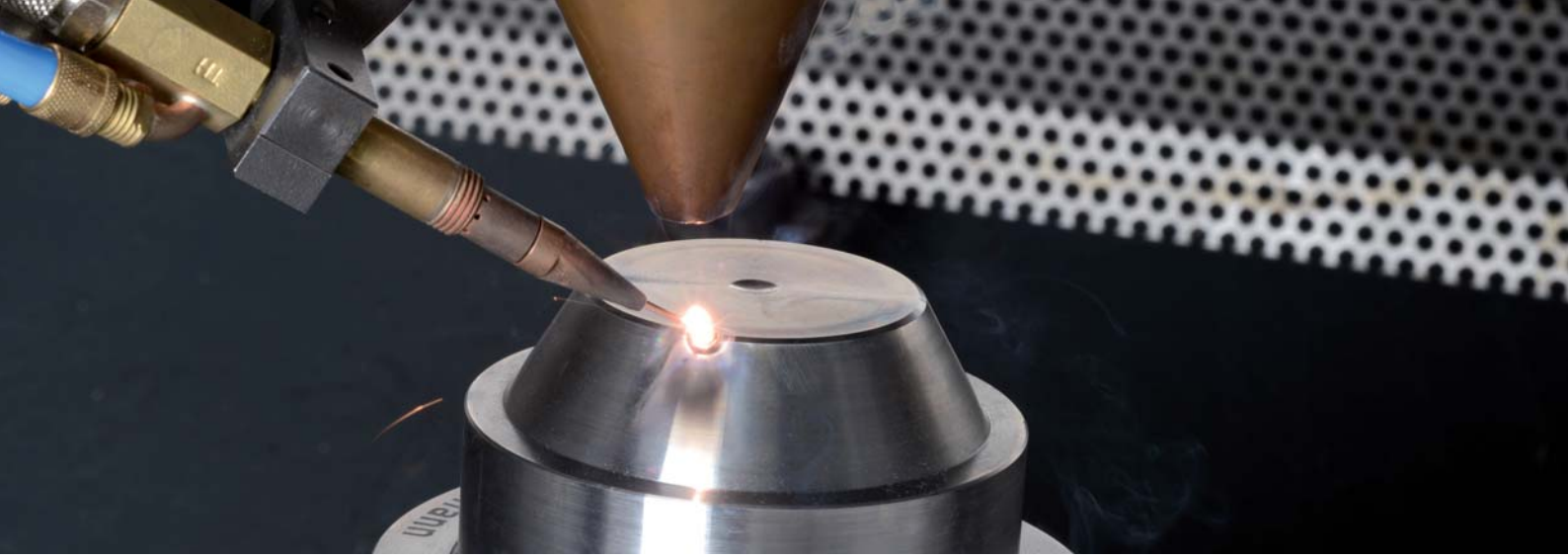


REPAIR, BUILD UP AND GEOMETRICAL MODIFICATIONS OF COMPLEX PARTS

Tools and dies wear during their use in areas where their load is highest. The abrasion within these areas leads to a failure of the tools and dies. However using laser deposition welding is an efficient process for repairing these. By local deposition of tool steel, the geometry can be restored which leads again to a proper function of the tools and dies.

Fraunhofer IPT developed an integrated CAx-based process planning for carrying out laser deposition welding automated but also individual on 5-axis machining systems for industrial applications. Concerning quality as well as efficiency, laser was proved to be the optimum tool.

Furthermore laser deposition welding suits for the whole build up of work pieces. By building the parts layer-by-layer, the integration of functions can be considered, e.g. close contoured cooling channels. By localized deposition of material, modifications of the workpiece's geometry can be also carried out which leads to a reduced effort in changes.

Critical areas of tools and dies can be hardfaced by applying additional layers of a hard-wearing material to increase the wear resistance and thus achieve longer lifetimes. This permits longer intervals between repairs.

Advantages of laser deposition welding

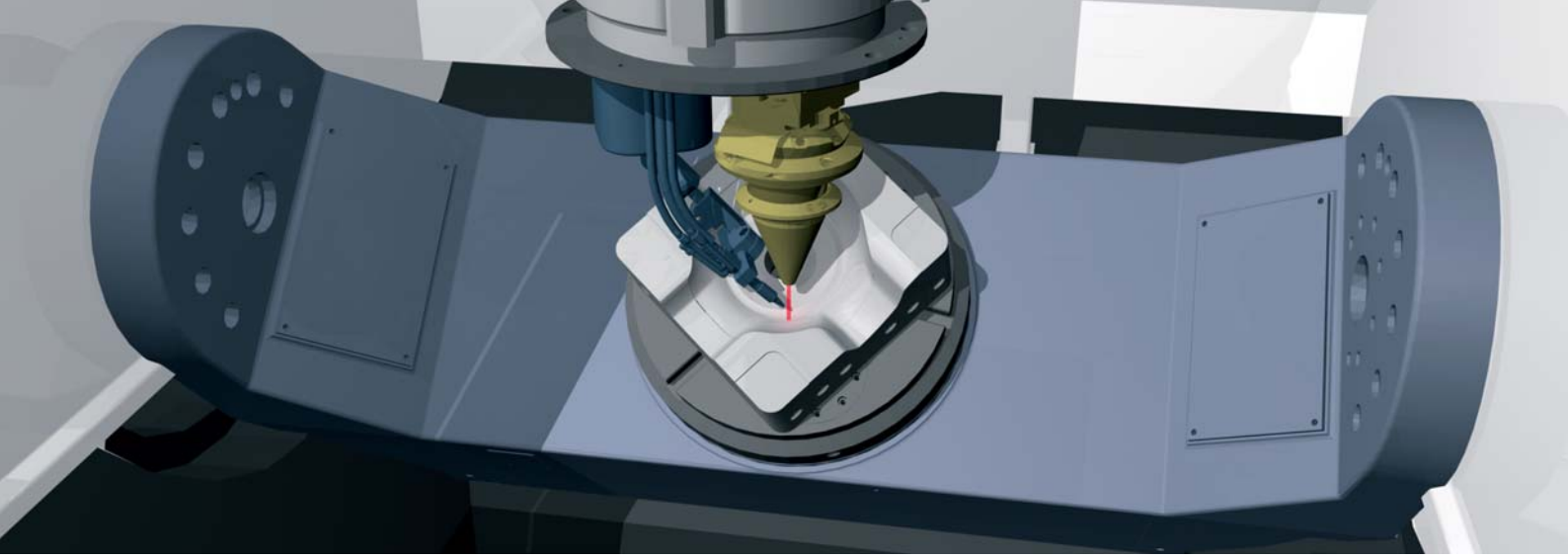
- Minimized introduction of heat into parts
- Flexible process control for complex parts
- Wide spectrum of materials
- Localized wear protection and thus significantly longer tool life time
- Flexible modification of surfaces to suit the collective loads

Our specialties

- Deposition on complex formed part surface using a modern machining system with automated 5-axis process control
- High degree of technical expertise in the design of laser processes and machining strategies
- Development and use of modern CAx technologies for product design, process design and simulations as well as NC data generation

Our offer

- Repair of worn out areas and correction of part geometries with reduced effort
- Build up of parts with integrated functionalities and modifications of complex geometries
- Independent advice that takes your individual needs into consideration
- Feasibility and profitability studies as well as production of small and medium-sized series



INTEGRATED SOFTWARE SOLUTION FOR LASER DEPOSITION WELDING

The Fraunhofer IPT has developed an integrated software for laser deposition welding that is easy to use: the CAx module integrates all the available knowledge about the laser process. This module brings the whole planning process for laser surface treatment together – from the detection of component geometry and process simulation to the generation of NC code for the machining system. Highly modern equipment is used to perform the automated 5-axis component machining processes.

Advantages of CAx-aided process design

- No special knowledge about laser technology is required for NC programming as the system is based on an extensive technology database.
- Laser processes can be quickly modified to meet individual component requirements.

Our specialties

- Intuitive software operation via a operator-friendly graphical user interface with minimal training required
- Linked to a process and technology database
- Processing data provided in common NC formats, e.g. Heidenhain iTNC, Sinumerik 840D, ISO-NC, Siemens PLM Software CLS, CATIA APT and in other dialects
- Seamless integration of the software module into existing software systems such as Siemens PLM Software NX

Our offer

- Development of software for processing complex tool geometries with laser deposition welding
- Support during on-site software implementation
- Software training and workshops

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