Fraunhofer Institute for Laser Technology ILT

LASER POWDER BED FUSION

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The Fraunhofer Institute for Laser Technology ILT is one of the most important development and contract research institutes in laser development and application worldwide. Its activities encompass a wide range of areas such as developing new laser beam sources and components, laser-based metrology, testing technology and industrial laser processes. This includes laser cutting, ablation, drilling, welding and soldering as well as surface treatment, micro processing and additive manufacturing. Furthermore, Fraunhofer ILT develops photonic components and beam sources for quantum technology.

Overall, Fraunhofer ILT is active in the fields of laser plant technology, digitalization, process monitoring and control, simulation and modeling, AI in laser technology and in the entire system technology. We offer feasibility studies, process qualification and laser integration in customized manufacturing lines. The institute focuses on research and development for industrial and societal challenges in the areas of health, safety, communication, production, mobility, energy and environment. Fraunhofer ILT is integrated into the Fraunhofer Gesellschaft.
Individualization for free

With the LPBF process it is possible to manufacture individualized components with different geometries simultaneously within one process.

Time to Market

Thanks to LPBF, prototypes can be built in small batches with series-identical material properties in a very short time. A systematic advantage is that it accelerates the development time by an increasing number of feasible iteration cycles, resulting in a shortened time until the market launch of a new product.

Digital Process Chain

To establish LPBF as an economical manufacturing process and to use the advantages in production, research needs to take an integrated view of the overall process chain, from component design, via LPBF process and system engineering all the way to final post-processing.

When digitalization of physical components (Digital Twin) is applied, it is possible to define component properties before production and implement them in the physical component directly using LPBF. This results in greater agility along the entire product life cycle.

LPBF at Fraunhofer ILT

Fraunhofer ILT developed the LPBF process in the middle of the nineties, and since then has constantly refined it in close cooperation with leading industry companies and research institutions while taking the whole process chain into consideration. Thanks to our expertise and many years of experience, our experts can assist you individually from the very first idea, through feasibility studies, process and system development all the way to implementing the results into your production chain. Thanks to our close cooperation with other Fraunhofer Institutes, the FH Aachen University of Applied Sciences, the University Hospital RWTH Aachen, the RWTH Aachen University, the Aachen Center for Additive Manufacturing (ACAM) as well as the International Center for Turbomachinery Manufacturing (ICTM), you can also profit from the bundled competence this location, Aachen, offers in the sector of additive manufacturing.

Range of Services

Among other things, the services ILT offers include the following R&D tasks along the entire process chain:

- Design of functionally adapted components
- Characterization of powder materials
- Development of components and complete machines for LPBF (Systems Engineering)
- Process monitoring for quality assurance
- Adapted process control to increase productivity
- Life cycle assessment of the entire process chain (sustainability)
- Characterization of the component and material properties
- Feasibility studies as well as the production of prototypes and very small series
- Market studies and consulting
- Workshops and seminars in the field of additive manufacturing

Contact

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