Fraunhofer Institute for Machine Tools and Forming Technology
Branch Dresden

About this organisation

Fraunhofer Institute for Machine Tools and Forming Technology IWU is a driver for innovations in the field of production research and development. Lightweight structures are essential success factors in this context. The focus lies on metal foams, hybrid materials, pultruded and printed fiber-plastic composites.

We develop, design and manufacture entire assembly groups using these materials. If requested, we optimize the functions and properties of the assembly groups by simulation before their manufacturing and verify these characteristics after the completed production by conducting property analyses. Additive manufacturing processes open up new possibilities regarding component design, material utilization and individual number of pieces: laser beam melting is used for tool-free manufacturing of geometrically complex metal components. Such components include tools with integrated tempering channels and medical titanium implants with patient-specific geometry or internal functional structures for higher patient comfort. High functional integration is achieved by integrating sensors and actuators into the components. The research activities in additive manufacturing of plastic components focus on material development, increase in efficiency and resource efficiency.

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Saxony
Germany
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Organisation type
Non-university research institution

Sectors

Employees
500 and more

Turnover
€10m - €50m

Funding
n/a


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Main areas covered	metal foam, fibre-reinforced plastics, metallic lightweighting, topology optimization, prototype construction
Infrastructure	
Certifications	ISO 9001
Keywords	E3 Research Factory, Metal Foam Center
Memberships	

Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Offer			
Products Parts and components, Semi-finished parts, Machines and plants, Software & databases, Materials, Tools and moulds	✓	✓	
Services & consulting Consulting, Testing and trials, Funding, Engineering, Prototyping, Simulation, Technology transfer	✓	✓	

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Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Field of technology			
Design & layout Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight construction concepts, Lightweight material construction	✓	✓	
Functional integration Actuator technology, Sensor technology	✓	✓	
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Loads & stress, Optimisation, Structural mechanics, Materials	✓	✓	
Plant construction & automation Plant construction, Automation technology, Handling technology, Robotics	✓	✓	
Recycling technologies			

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Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS)	✓	✓	
Coating (surface engineering)			
Fibre composite technology Resin infusion process, Resin transfer moulding, Pre-preg processing	✓	✓	
Forming Impact extrusion, Compression moulding, Thermal converting, Deep-drawing, Fluid active media based forming, Rolling	✓	✓	
Joining Clinching, Hybrid joining, Adhesive bonding, Sewing, Riveting	✓	✓	
Material property alteration			
Primary forming Pultrusion, Sintering, Injection moulding	✓	✓	
Processing and separating			
Textile technology Preforming	✓	✓	

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Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Material			
Biogenic materials			
Cellular materials (foam materials) Closed-pore, Open-pore	✓	✓	
Composites Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP)	✓	✓	
Fibres Aramid fibres, Glass fibres, Carbon fibres	✓	✓	
Functional materials Shape memory materials, Piezoelectric materials	✓	✓	
Metals Aluminium, Magnesium, Steel, Titanium	✓	✓	
Plastics Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
Structural ceramics			
(Technical) textiles Meshes, Laid webs, Woven fabrics, Knitted fabrics, Nonwovens, mats	✓	✓	

Contacts

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