Fraunhofer Centre for High Temperature Lightweight Construction HTL

About this organisation

Machine translation

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Research at the Fraunhofer Centre for High Temperature Lightweight Construction HTL focuses on sustainable heating processes. Sustainability is achieved through high quality as well as energy and cost efficiency of the processes. With this goal in mind, the HTL develops materials and components, measurement and simulation methods for high-temperature applications. Important applications are in heat, drive and energy technology.

At the Fraunhofer HTL Centre, ceramic and metallic components as well as composites are developed in a closed process chain from component design and material design to production on a pilot plant scale and testing of the application behaviour. The technological focus is on the production of lightweight components from ceramic matrix composites (CMC). The entire process chain is covered, from the development of ceramic fibres and their coating to textile fibre processing, matrix construction, thermal processing and joining through to final processing. In addition, processes such as 3D printing are also available for the production of metal and ceramic components with complex geometries. Thermo-optical measuring furnaces (TOM) are developed at the HTL to test high-temperature materials and optimise their manufacturing processes.

Fraunhofer ISC

Organisation type
Non-university research institution

Sectors

Employees
50 up to 249

Turnover
€2m - €10m

Funding
n/a

Gottlieb-Keim-Straße 62
95448 Bayreuth
Bavaria
Germany
www.htl.fraunhofer.de




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About this organisation

Main areas covered	Ceramic fibre development, CMC components, Non-destructive testing, FE simulation, Component modelling
Infrastructure	Fibre spinning plant, Coating system, Computer tomography, Technical centre for prototype production
Certifications	ISO 9001:2015
Keywords	High-temperature lightweight construction, Ceramic fibres, Simulation, ThermoOptical Measuring Systems TOM, CMC, Ox/Ox, SiC/SiC
Memberships	

Overview of lightweighting expertise

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

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Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Field of technology			
Design & layout Others: null	✓	✓	✓
Functional integration			
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), System analysis, Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Loads & stress, Optimisation, Processes, Structural mechanics, Materials	✓	✓	✓
Plant construction & factory automation Plant construction	✓	✓	✓
Recycling technologies Upcycling	✓	✓	

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Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS), Stereolithography	✓	✓	✓
Coating (surface engineering) Painting, Powder coating	✓	✓	
Fibre composite technology Filament winding, Casting (concrete), Manual lamination, Resin infusion process, Pre-preg processing	✓	✓	✓
Forming			
Joining Adhesive bonding, Soldering	✓	✓	
Material property alteration Heat treatment	✓	✓	
Primary forming			
Processing and separating Drilling, Turning, Milling, Sawing, Grinding, Cutting			✓
Textile technology Fibre manufacturing, Braiding, Yarn & roving production, Preforming, Knitting, Textile surface treatment and finishing, Nonwoven & mats production, Weaving, Knitting, laid web production	✓	✓	✓

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	Research	Development	Manufacturing & Supply
Material			
Biogenic materials			
Cellular materials (foam materials) Closed-pore, Open-pore	✓	✓	✓
Composites Glass-fiber reinforced plastics (GFRP), Ceramic matrix composite (CMC), Carbon-fiber reinforced plastics (CFRP), Short fibre-reinforced concrete, Metal-ceramic composite, Metal matrix composite, Laminates, Particulate composites, Textile-reinforced concrete	✓	✓	✓
Fibres Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres	✓	✓	✓
Functional materials			
Metals			
Plastics Thermoplastics			✓
Structural ceramics Monolithic ceramics, Non-oxidic ceramics, Oxidic ceramics, Ultra-high-temperature ceramics	✓	✓	✓
(Technical) textiles Yarns, rovings, Meshes, Laid webs, Crocheted fabrics, Woven fabrics, Knitted fabrics, Nonwovens, mats	✓	✓	✓

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Contacts

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