

About this organisation

Machine translation

This organisation has been machine-translated based on data provided in German.

The Composite Materials and Interface Layers department deals with joining processes and the property profile of joined components, with a particular focus on lightweight materials and construction methods at the Open Hybrid LabFactory (OHLF) in Wolfsburg.

Essentially, the connection of the different components in hybrid components is considered. This involves, for example, the form-fit and/or material-fit connection of the polymer components to the metallic structures, but also the adhesion between matrix and fibres in a fibre composite. The properties of boundary layers must be determined and evaluated in order to optimise the composite. In many cases, surface treatment is then required, which can be mechanical, physical or chemical in nature. In addition, processes are being researched and optimised, mainly with the aim of shortening process times and making processes more robust. New test methods are also being established in order to better describe material behaviour.

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www.tu-braunschweig.de/ifs



Institut für Füge- und
Schweißtechnik **ifs**

Organisation type

University or higher education institution

Sectors

No specific sector

Employees

50 up to 249

Turnover

n/a

Funding

Main areas covered

Joining different materials, Boundary layer characterisation, Boundary layer modification, Material composites, Hybrid lightweight construction

Infrastructure

Surface analytics, Polymer analytics, Mechanical testing technology, Joining technology centre (various processes)

Certifications

Keywords

Fügen, Lightweight construction, Boundary layer, Analytics, Sustainability

Memberships

DVS, OHLF

Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Offer			
Products Parts and components, Semi-finished parts, Materials, Tools and moulds	✓	✓	
Services & consulting Training, Consulting, Testing and trials, Standardisation, Validation, Simulation, Technology transfer	✓	✓	
Field of technology			
Design & layout Lightweight manufacturing, Hybrid structures, Lightweight construction concepts, Lightweight material construction	✓	✓	
Functional integration Actuator technology, Media conductivity, Sensor technology, Thermal activation, Material functionalisation	✓		
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Crash behaviour, Loads & stress, Life-cycle analysis, Optimisation, Structural mechanics, Materials	✓	✓	
<i>Plant construction & automation</i>			
Recycling technologies Material separation, Recycling	✓		

Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing, Deposition welding, Fused deposition modeling, Selective laser melting (SLM, LPBF, ...)	✓		
Coating (surface engineering) Plasma process, Sputtering	✓		
Fibre composite technology Manual lamination, Resin infusion process, Resin transfer moulding, Pre-preg processing, Vacuum infusion	✓	✓	
Forming Impact extrusion, Compression moulding, Thermal converting, Deep-drawing, Fluid active media based forming	✓	✓	
Joining Clinching, Hybrid joining, Adhesive bonding, Soldering, Riveting, Welding	✓	✓	
Material property alteration Mechanical treatment, Thermochemical treatment, Thermomechanical treatment	✓	✓	
Primary forming Extrusion, Casting, Injection moulding	✓	✓	
Processing and separating Cutting	✓		
Textile technology Textile surface treatment and finishing	✓		

Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Bioplastics, Biocomposites, Wood	✓	✓	
Cellular materials (foam materials) Closed-pore, Open-pore	✓		
Composites Aramid fibre composites, Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Metal-fibre-polymer composite, Nanocomposites, Natural fibre reinforced plastics (NFRP), Laminates	✓		
Fibres Aramid fibres, Glass fibres, Carbon fibres, Metal fibres, Natural fibres	✓	✓	
Functional materials Electrostrictive / magnetostrictive materials, Shape memory materials	✓		
Metals Aluminium, Intermetallic alloys, Magnesium, Steel	✓	✓	
Plastics Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
<i>Structural ceramics</i>			
(Technical) textiles Yarns, rovings, Meshes, Laid webs, Woven fabrics, Knitted fabrics, Nonwovens, mats	✓		

TU Braunschweig

Institute of Joining and Welding Technology - Material Composites & Interface Layers

Contacts

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