Brandenburg University of Technology Cottbus-Senftenberg

Department of Polymer-based Lightweight Construction (PbL)

About this organisation

Machine translation

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

Along the product-orientated value chain, the international and interdisciplinary team of the Polymer-based Lightweight Construction (PbL) department is involved in the cross-industry development of energy-efficient lightweight construction solutions and associated production technologies. The focus is primarily on the design, simulation and production of functionally integrative multi-material construction methods.

The lightweight construction competences and research focuses in the field of polymer-based lightweight construction are: - Sustainable lightweight construction solutions with fibre-reinforced composites - Design, coupled process and structural simulation as well as prototype production of lightweight systems in metal and fibre composite construction - Development of special joining technologies and load application systems for high-strength composite structures with fibre-reinforced composites (FRP) and metals that are suitable for force flow - Continuous design and optimisation of manufacturing processes and process chains - Holistic material-adapted additive manufacturing processes - Material-appropriate recycling and repair processes - Testing lightweight constructions under mechanical, thermal and medial loads - Functionalisation of lightweight materials.

Organisation type
University or higher education institution

Sectors

Employees
10 up to 49

Turnover
€2m - €10m

Funding
n/a

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Main areas covered	Processes and components, Additive manufacturing processes, Examination, Plastics processing technologies, Function integration
Infrastructure	Automated Fibre Placement (AFP), Prepreg slitter, rewinding system, 2K injection moulding machine, extrusion, Hot press, autoclave, RTM, Additive manufacturing centre (LFAM)
Certifications	ISO 9001
Keywords	Automated Fibre Placement (AFP), Additive manufacturing (3D printing), Hybrid technologies, Design, production, simulation, Rapid manufacturing
Memberships	Carbon Composites e.V., VDI AK Plastics and Lightweight Construction Technology, Plastics Association BB e.V. (KuVBB), Network Lightweight Metal BB (LMB), Plastics and Chemistry Cluster BB

Overview of lightweighting expertise

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

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	Research	Development	Manufacturing & Supply
Field of technology			
Design & layout Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight material construction	✓	✓	
Functional integration Media conductivity, Sensor technology, Thermal activation, Material functionalisation	✓	✓	
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), Environmental simulation, Materials analysis, Destructive analysis, Non-destructive analysis	✓		✓
Modelling and simulation Crash behaviour, Loads & stress, Life-cycle analysis, Multiphysics simulation, Optimisation, Processes, Structural mechanics, Materials, Reliability validation	✓	✓	✓
Plant construction & factory automation Handling technology, Robotics	✓	✓	
Recycling technologies Downcycling, Material separation, Recycling, Upcycling	✓	✓	

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	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing, Laminated object manufacturing (LOM), Fused deposition modeling, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS)	✓	✓	✓
Coating (surface engineering)			
Fibre composite technology Fibre spraying, Filament winding, Manual lamination, Resin infusion process, Resin transfer moulding, Pre-preg processing, Vacuum infusion	✓	✓	✓
Forming Bending, Compression moulding, Thermal converting	✓	✓	
Joining Hybrid joining, Adhesive bonding, Soldering, Riveting, Screwing, Welding	✓	✓	
Material property alteration Mechanical treatment, Thermomechanical treatment, Heat treatment	✓	✓	
Primary forming Extrusion, Sintering, Injection moulding	✓	✓	✓
Processing and separating Drilling, Turning, Milling, Sawing, Shearing/ punching, Grinding, Cutting	✓		✓
Textile technology Fibre manufacturing, Preforming, Textile surface treatment and finishing, Knitting, laid web production	✓	✓	✓

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	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Bioplastics, Biocomposites	✓	✓	
Cellular materials (foam materials) Closed-pore	✓	✓	
Composites Aramid fibre composites, Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Short fibre-reinforced concrete, Nanocomposites, Laminates, Textile-reinforced concrete	✓	✓	
Fibres Aramid fibres, Glass fibres, Carbon fibres, Natural fibres	✓	✓	
Functional materials Piezoelectric materials	✓	✓	
Metals Aluminium, Steel, Titanium	✓	✓	
Plastics Thermoset plastics, Thermoplastics	✓	✓	
Structural ceramics Oxidic ceramics, Ultra-high-temperature ceramics	✓	✓	
(Technical) textiles Yarns, rovings, Meshes, Laid webs, Woven fabrics, Knitted fabrics	✓	✓	

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Contacts

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