University of Paderborn

Chair of Lightweight Automotive Engineering (LiA)

About this organisation

Machine translation

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

The Chair of Lightweight Automotive Design (LiA) deals with sustainable lightweight design solutions, starting with methodological design and materials expertise through to the component manufacturing process and experimental validation. Research focuses on lightweight construction concepts made of high-strength metallic materials and lightweight materials as well as the symbiotic combination of different materials to form hybrid composites.

Energy and resource efficiency, taking into account the economic boundary conditions, are essential requirements for sustainable developments. The basic principles and advanced lightweight construction concepts researched at the Chair of Lightweight Automotive Design (LiA) can make a significant contribution to saving resources and energy through the use of load-adapted component structures. In this way, material is only really used where it is necessary due to the load. The hybrid approach is the consistent further development of this lightweight construction approach, so that the material best suited to the respective requirement is used locally and the added value for the hybrid composite is only created in the symbiosis of the individual materials. Extensive experimental equipment, a wide range of numerical development tools and prototype production methods enable a holistic view of the research and development programme at LiA.

Mersinweg 7
33100 Paderborn
North Rhine-Westphalia
Germany
www.leichtbau-im-automobil.de

Organisation type
University or higher education institution

Sectors

Employees
10 up to 49

Turnover
€2m - €10m

Funding

University of Paderborn

Chair of Lightweight Automotive Engineering (LiA)

About this organisation

Main areas covered	High-strength metallic materials, FKV and hybrid construction, Additive manufacturing, Methodical design & simulation, Material and component testing
Infrastructure	Uni- & multiaxial testing, Prototypical manufacturing processes, FLC determination (up to 850 °C), Dynamic & cyclical tests, Metallography & mech. workshop
Certifications	
Keywords	Lightweight automotive construction, Hybrid lightweight materials, Simulation, Additive manufacturing, Measuring and testing technology
Memberships	EFB e. V., DGM e. V., NanoMicroMaterials, Zukunftsallianz Maschinenbau e. V., DieMaschinenbauPartner e. V.

Overview of lightweighting expertise

Machine translation

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

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

University of Paderborn

Chair of Lightweight Automotive Engineering (LiA)

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Field of technology			
Design & layout Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight construction concepts, Lightweight material construction	✓	✓	✓
Functional integration 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, Multiphysics simulation, Optimisation, Processes, Structural mechanics, Materials	✓	✓	✓
Plant construction & automation			
Recycling technologies Downcycling, Material separation, Recycling	✓	✓	

University of Paderborn

Chair of Lightweight Automotive Engineering (LiA)

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing, Deposition welding, Fused deposition modeling, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS)	✓	✓	✓
Coating (surface engineering)			
Fibre composite technology Manual lamination, Resin infusion process, Resin transfer moulding, Pre-preg processing, Vacuum infusion, Others (Impact extrusion)	✓	✓	✓
Forming Bending, Thermal converting, Deep-drawing			✓
Joining Hybrid joining, Adhesive bonding, Riveting, Screwing, Welding			✓
Material property alteration Thermomechanical treatment, Heat treatment	✓	✓	✓
Primary forming			
Processing and separating Drilling, Turning, Milling, Electrical discharge machining, Honing, Sawing, Shearing/punching, Grinding, Cutting			✓
Textile technology Preforming			✓

University of Paderborn

Chair of Lightweight Automotive Engineering (LiA)

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Wood	✓	✓	
Cellular materials (foam materials)			
Composites Aramid fibre composites, Basalt fibre-reinforced plastic, Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Natural fibre reinforced plastics (NFRP)	✓	✓	✓
Fibres Basalt fibres, Glass fibres, Carbon fibres, Natural fibres	✓	✓	
Functional materials			
Metals Aluminium, Intermetallic alloys, Magnesium, Steel, Titanium	✓	✓	
Plastics Thermoset plastics, Thermoplastics	✓	✓	
Structural ceramics			
(Technical) textiles			

Contacts

Machine translation

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

University of Paderborn
Chair of Lightweight Automotive Engineering (LiA)

Contacts

Mr Prof. Dr. Thomas Tröster

Head of department

thomas.troester@uni-paderborn.de

Mr Dr.-Ing. Thorsten Marten

Chief engineer

thorsten.marten@uni-paderborn.de