Fraunhofer-Institut für Chemische Technologie ICT

Polymer Engineering

About this organisation

Lightweight construction dominates the research and development of land, air and water transport. We develop innovative solutions for future lightweight products. Our aim is holistic material and process development for robust, automated and flexible technologies in the context of increasing digitalization and the demand for resource-saving material efficiency.

Research departments relevant to lightweight construction: • Polymer Engineering (material and process development) • Environmental Engineering (recycling management) • Applied Electrochemistry (battery research) • New Drive Systems (lightweight powertrain design) Research priorities: • Material development and compounding technologies • Foam technologies • Processing and manufacturing methods for fiber composites • Surface treatment and hybridization • CAx-supported product and process development • Recycling management Technologies: • Injection molding with long fibers (LFT-D) and local reinforcement • Foam injection molding (MuCell, CBA, LFT-D foam) • Tape laying (FiberForge), consolidation, forming, hybridization • LFT presses (D-LFT and GMT) • Particle foam and foam extrusion • Sheet molding compound • Thermoset injection molding • High-pressure RTM process chain (autom. preforming/ infiltration) • PU fiber spraying • Prepreg and InlinePrepreg • Pultrusion • Wet compression

Joseph-von-Fraunhofer-Straße 7
76327 Pfinztal
Baden-Württemberg
Germany
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Organisation type
Non-university research institution

Sectors

Employees
500 and more

Turnover
€10m - €50m

Funding





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Main areas covered	Fiber composites, material and process development, component design methods, component testing
Infrastructure	Injection molding: 50-1600 t., presses 550 - 3600 t., twin-screw extruders, HP-RTM / T-RTM, SMC
Certifications	
Keywords	Composite laminate, tape, LFT, RTM process chain, wet compression, function integration, hybrid lightweight construction
Memberships	Leichtbau Zentrum Baden-Württemberg, Fraunhofer Lightweight Alliance, Federation Reinforced Plastics AVK, Composites United, AFBW

Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Offer			
Products Parts and components, Systems and end products, Materials	✓	✓	
Services & consulting Training, Consulting, Testing and trials, Engineering, Validation, 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 Sensor technology, Material functionalisation	✓	✓	
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), System analysis, Environmental simulation, Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Crash behaviour, Loads & stress, Optimisation, Processes, Structural mechanics, Materials	✓	✓	
Plant construction & automation Plant construction	✓	✓	
Recycling technologies Material separation, Recycling	✓	✓	

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Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing	✓	✓	
Coating (surface engineering) Plasma process	✓	✓	
Fibre composite technology Fibre spraying, Filament winding, Manual lamination, Resin infusion process, Resin transfer moulding, Pre-preg processing, Vacuum infusion, Others (LFT-D LFT-Foams Composite laminate UD-Tapes Tape-Gelege HP-RTM T-RTM SMC / SMC-D)	✓	✓	
Forming Impact extrusion, Compression moulding, Thermal converting	✓	✓	
Joining			
Material property alteration			
Primary forming Extrusion, Pultrusion, Sintering, Injection moulding	✓	✓	
Processing and separating			
Textile technology			

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Overview of lightweighting expertise

	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Bioplastics, Biocomposites	✓	✓	
Cellular materials (foam materials) Closed-pore, Open-pore, Others (Faserverstärkte Schäume, LFT-Schäume, Partikelschaum, Extrusionsschaum, Bioschaum)	✓	✓	
Composites Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Natural fibre reinforced plastics (NFRP)	✓	✓	
Fibres Aramid fibres, Glass fibres, Carbon fibres, Natural fibres	✓	✓	
Functional materials			
Metals			
Plastics Thermoset plastics, Thermoplastics	✓	✓	
Structural ceramics			
(Technical) textiles			

Contacts

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