Fraunhofer Institute for Applied Polymer Research IAP

Research Division Polymer Materials and Composites PYCO

About this organisation

Machine translation

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

The PYCO department deals with all aspects of polymer-based lightweight construction with fibre-plastic composites and complex fibre composite components in multi-material design. The holistic approach includes not only innovative construction methods, material design, structures and manufacturing technologies, but also the development of sustainable utilisation and recycling strategies for end-of-life scenarios and individual solutions thanks to state-of-the-art equipment.

From the development of special polymers and semi-finished fibre composites, to the design of prototypes, to the planning and implementation of production processes suitable for large-scale production, all important lightweight construction competencies in the value chain can be mapped under one roof, from monomers to energy-efficient high-performance composite components. Such a bundling effect is a unique selling point in the German research landscape. Together with companies, the materials scientists develop highly cross-linked polymers, SMC and BMC semi-finished products as well as high-performance prepregs for FRPs. The Design and Manufacturing Technologies department is responsible for the design and layout as well as the production-related realisation of high-performance components. During development, employees use the latest software and simulation tools, highly automated series production technologies and material developments from the Customised Materials department.

Schmiedestraße 5
15745 Wildau
Brandenburg
Germany
www.iap.fraunhofer.de/de/Forschungsbereiche/PYCO.html

Fraunhofer IAP

Organisation type
Non-university research institution

Sectors

Employees
10 up to 49

Turnover
n/a

Funding

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About this organisation

Main areas covered	Customised lightweight solutions
Infrastructure	Autoclaves, 2K, 3K injection moulding machines, press, 3D printer, Water jet cutting system, Impregnation systems
Certifications	-
Keywords	Polymers and composites, Resin formulations and synthesis, Characterisation and structural tests, Efficient production technologies, Design of structural components
Memberships	Composites United e.V., Fraunhofer MATERIALS Alliance, BBAA e.V., Lusatia hydrogen network, HZwo e.V.

Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Offer			
Products Parts and components, Semi-finished parts, Machines and plants, Materials, Tools and moulds	✓	✓	
Services & consulting Training, Testing and trials, Engineering, 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 Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight construction concepts, 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), System analysis, 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 & automation			
Recycling technologies Material separation, Recycling	✓	✓	

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Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing 3D printing	✓	✓	
Coating (surface engineering) Painting, Plasma process, Hot dipping, Sputtering	✓	✓	
Fibre composite technology Fibre spraying, Filament winding, Manual lamination, Resin infusion process, Resin transfer moulding, Pre-preg processing, Vacuum infusion	✓	✓	
Forming Bending, Impact extrusion, Compression moulding, Thermal converting	✓	✓	
Joining Hybrid joining, Adhesive bonding, Sewing, Riveting, Screwing	✓	✓	
Material property alteration Mechanical treatment, Thermochemical treatment, Thermomechanical treatment, Heat treatment	✓	✓	
Primary forming Extrusion, Casting, Pultrusion, Injection moulding	✓	✓	
Processing and separating Drilling, Turning, Milling, Sawing, Shearing/ punching, Grinding, Cutting	✓	✓	
Textile technology Preforming, Textile surface treatment and finishing	✓	✓	

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	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Bioplastics, Biocomposites	✓	✓	
Cellular materials (foam materials) Closed-pore, Open-pore	✓	✓	
Composites Aramid fibre composites, Basalt fibre-reinforced plastic, Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Metal-fibre-polymer composite, Nanocomposites, Natural fibre reinforced plastics (NFRP), Laminates, Particulate composites, Textile-reinforced concrete	✓	✓	
Fibres Aramid fibres, Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres, Metal fibres, Natural fibres	✓	✓	
Functional materials			
Metals			
Plastics Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
Structural 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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