

# Fraunhofer Institute for Applied Polymer Research IAP

## Research Division Polymer Materials and Composites PYCO

### About this organisation

#### Machine translation

This profile 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 prepreps 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.

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Germany  
[www.iap.fraunhofer.de/de/Forschungsbereiche/PYCO.html](http://www.iap.fraunhofer.de/de/Forschungsbereiche/PYCO.html)



#### Organisation type

Non-university research institution

#### Sectors



#### Employees

10 up to 49

#### Turnover

n/a

#### Funding



[Projects in the funding catalogue](#)

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<b>Main areas covered</b>	Customised lightweight solutions
<b>Infrastructure</b>	Autoclaves, 2K, 3K injection moulding machines, press, 3D printer, Water jet cutting system, Impregnation systems
<b>Certifications</b>	-
<b>Keywords</b>	Polymers and composites, Resin formulations and synthesis, Characterisation and structural tests, Efficient production technologies, Design of structural components
<b>Memberships</b>	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
<b>Offer</b>			
<b>Products</b> Parts and components, Semi-finished parts, Machines and plants, Materials, Tools and moulds	✓	✓	
<b>Services &amp; consulting</b> Training, Testing and trials, Engineering, Prototyping, Validation, Simulation, Technology transfer	✓	✓	

## Overview of lightweighting expertise

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

## Overview of lightweighting expertise

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

## Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
<b>Material</b>			
<b>Biogenic materials</b> Bioplastics, Biocomposites	✓	✓	
<b>Cellular materials (foam materials)</b> Closed-pore, Open-pore	✓	✓	
<b>Composites</b> 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	✓	✓	
<b>Fibres</b> Aramid fibres, Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres, Metal fibres, Natural fibres	✓	✓	
<i>Functional materials</i>			
<i>Metals</i>			
<b>Plastics</b> Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
<i>Structural ceramics</i>			
<b>(Technical) textiles</b> Yarns, rovings, Meshes, Laid webs, Crocheted fabrics, Woven fabrics, Knitted fabrics, Nonwovens, mats	✓	✓	

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### Contacts

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