

# Fraunhofer MATERIALS Alliance

## About this organisation

### Machine translation

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

The Fraunhofer Group for Materials and Components - MATERIALS pools the expertise of the Fraunhofer-Gesellschaft's materials science institutes. The Group's range of expertise and services covers the entire value chain. This applies to metallic, inorganic-non-metallic, polymeric materials, materials produced from renewable raw materials, semiconductor materials, hybrid materials and composite materials.

-Development of new and improvement of existing materials and material composites / materials for lightweight construction -Development of CMC ceramic matrix composites for high-temperature lightweight construction -metal and ceramic foams -Biobased fibre composites -Material analysis and characterisation - Functionalisation of materials/surfaces and functional integration -Construction and design of lightweight structures -Destructive and non-destructive analysis and testing methods (e.g. computer tomography) -Structural health monitoring of composite structures -Experimental and numerical simulation, multi-scale simulation -modelling -Digitalisation in lightweight construction, digital twin - Evaluation of the application behaviour of components and systems -Investigation of the ageing process on plastics and fibre/matrix systems -Recycling of composite materials

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Hesse  
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### Organisation type

Cluster

### Sectors



Others: Chemische Industrie, Kunststofftechnik

### Employees

Up to 9

### Turnover

n/a

### Funding

n/a

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## About this organisation

### Main areas covered

High-temperature lightweight construction, Operationally stable lightweight construction, Functionally integrated lightweight construction, Fibre composite lightweight construction, Multi-material lightweight construction

### Infrastructure

### Certifications

### Keywords

### Memberships

## Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
<b>Offer</b>			
<b>Products</b> Parts and components, Semi-finished parts, Systems and end products, Materials	✓	✓	
<b>Services &amp; consulting</b> Training, Consulting, 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
<b>Field of technology</b>			
<b>Design &amp; layout</b> Lightweight manufacturing, Hybrid structures, Lightweight construction concepts, Lightweight material construction	✓	✓	
<b>Functional integration</b> Actuator technology, 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, Structural mechanics, Materials, Reliability validation	✓	✓	
<i>Plant construction &amp; automation</i>			
<b>Recycling technologies</b> Downcycling, Material separation, Recycling, Upcycling	✓	✓	

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	Research	Development	Manufacturing & Supply
<b>Manufacturing process</b>			
<b>Additive manufacturing</b> 3D printing, Electron beam melting, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS)	✓	✓	
<i>Coating (surface engineering)</i>			
<b>Fibre composite technology</b> Fibre spraying, Filament winding, Manual lamination, Resin transfer moulding, Pre-preg processing	✓	✓	
<i>Forming</i>			
<b>Joining</b> Hybrid joining, Adhesive bonding	✓	✓	
<i>Material property alteration</i>			
<b>Primary forming</b> Extrusion, Casting, Sintering, Injection moulding	✓	✓	
<i>Processing and separating</i>			
<b>Textile technology</b> Fibre manufacturing	✓	✓	

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	Research	Development	Manufacturing & Supply
<b>Material</b>			
<b>Biogenic materials</b> Bioplastics, Biocomposites, Wood	✓	✓	✓
<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), Ceramic matrix composite (CMC), Carbon-fiber reinforced plastics (CFRP), Metal-ceramic composite, Nanocomposites, Natural fibre reinforced plastics (NFRP)	✓	✓	
<b>Fibres</b> Ceramic fibres, Natural fibres	✓	✓	
<b>Functional materials</b> Electrorheological/magnetorheological fluids, Electrostrictive / magnetostrictive materials, Piezoelectric materials	✓	✓	
<i>Metals</i>			
<b>Plastics</b> Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
<b>Structural ceramics</b> Monolithic ceramics, Non-oxidic ceramics, Oxidic ceramics, Ultra-high-temperature ceramics	✓	✓	
<b>(Technical) textiles</b> Meshes, Laid webs, Woven fabrics, Knitted fabrics	✓	✓	

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## Contacts

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