

TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group for special materials and special processes

About this organisation

Machine translation

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

At the Institute of Lightweight Engineering and Polymer Technology at TU Dresden, nine specialist groups focus on different areas of lightweight construction. The research focus of the Special Materials and Processes group is on metal matrix composites, ceramic matrix composites, magnetic hybrid materials, customised fibre functionalisation and generative manufacturing processes, such as continuous fibre-reinforced 3D printing.

The high customisability of additive processes paired with conventional technologies, the performance of fibre-reinforced materials, the adaptability of bionic structures, the good-natured failure behaviour of metallic materials and the thermal resistance of ceramics are constantly opening up new fields of application and unimagined potential. This deliberate fusion of technologies and material characteristics is the key expertise of the Special Materials and Special Processes Group at the Institute of Lightweight Engineering and Polymer Technology. The aim of the specialist group is the targeted further development and research of innovative hybrid manufacturing processes and highly resilient mixed composites to establish "generative multi-material lightweight construction" as an internationally leading technology for multi-layer composite structures with stress-appropriate 3D fibre reinforcement.

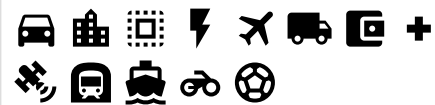
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tu-dresden.de/ing/maschinenwesen/ilk/forschung/fachgruppe-sonderwerkstoffe-und-verfahren



Organisation type

University or higher education institution

Sectors



Employees

Up to 9

Turnover

Up to €2m

Funding

n/a



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| | |
|---------------------------|---|
| Main areas covered | Multi-material lightweight construction, High-temperature materials, Magnetic hybrid materials, Tailor-made carbon fibres, Generative manufacturing |
| Infrastructure | Generative manufacturing innovation lab, CVD system for fibre coating, LT, HT, HTT carbonisation systems, High-temperature ovens |
| Certifications | |
| Keywords | 3D printing, Multi-material lightweight construction, Smart materials, Generative manufacturing, Hybrid structures |
| Memberships | |

Overview of lightweighting expertise

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| | Research | Development | Manufacturing & Supply |
|---|----------|-------------|------------------------|
| Offer | | | |
| Products Parts and components, Semi-finished parts, Materials, Tools and moulds | ✓ | ✓ | |
| Services & consulting Training, Consulting, Testing and trials, Funding, Engineering, Standardisation, Prototyping, Technology transfer | ✓ | ✓ | |

Overview of lightweighting expertise

Machine translation

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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 Thermal activation, Material functionalisation | ✓ | ✓ | |
| Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), Materials analysis, Non-destructive analysis | ✓ | ✓ | |
| Modelling and simulation Materials | ✓ | ✓ | |
| Plant construction & automation Plant construction, Handling technology | ✓ | ✓ | |
| <i>Recycling technologies</i> | | | |

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| | Research | Development | Manufacturing & Supply |
|---|----------|-------------|---------------------------|
| Manufacturing process | | | |
| Additive manufacturing 3D printing, Selective laser sintering (SLS) | ✓ | ✓ | |
| Coating (surface engineering) Others (CVD coating) | ✓ | ✓ | |
| Fibre composite technology Vacuum infusion | ✓ | ✓ | |
| <i>Forming</i> | | | |
| <i>Joining</i> | | | |
| Material property alteration Thermomechanical treatment, Heat treatment | ✓ | ✓ | |
| Primary forming Others (Pyrolysis of ceramic composites, gas pressure infiltration) | ✓ | ✓ | |
| <i>Processing and separating</i> | | | |
| Textile technology Fibre manufacturing, Preforming, Textile surface treatment and finishing | ✓ | ✓ | |

Overview of lightweighting expertise

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| | Research | Development | Manufacturing & Supply |
|---|----------|-------------|---------------------------|
| Material | | | |
| Biogenic materials Bioplastics, Biocomposites, Wood | ✓ | ✓ | |
| Cellular materials (foam materials) Open-pore | ✓ | ✓ | |
| Composites Aramid fibre composites, Basalt fibre-reinforced plastic, Glass-fiber reinforced plastics (GFRP), Ceramic matrix composite (CMC), Carbon-fiber reinforced plastics (CFRP), Metal-fibre-polymer composite, Metal-ceramic composite, Metal matrix composite, Natural fibre reinforced plastics (NFRP), Textile-reinforced concrete | ✓ | ✓ | |
| Fibres Aramid fibres, Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres, Metal fibres, Natural fibres | ✓ | ✓ | |
| Functional materials Electrorheological/magnetorheological fluids | ✓ | ✓ | |
| Metals Aluminium, Intermetallic alloys, Magnesium, Steel, Titanium | ✓ | ✓ | |
| Plastics Thermoset plastics, Elastomers, Thermoplastics | ✓ | ✓ | |
| Structural ceramics Monolithic ceramics, Non-oxidic ceramics, Oxidic 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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This organisation has been machine-translated based on data provided in German.

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Employees special materials and processes

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