TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

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. One focus of the work of the Material Models specialist group is the material-mechanical analysis of fibre-reinforced composites.

One focus of the work of the Material Modelling Group at the Institute of Lightweight Structures and Polymer Engineering at TU Dresden is the material-mechanical analysis of textile-reinforced composites. With its high variability and high specific mechanical properties, this relatively young group of materials offers particularly great potential for lightweight construction applications. For textile composites with different fibre types, matrix systems and textile reinforcement systems, the ILK derives phenomenologically motivated and physically based material models for different load scenarios and translates them into practical calculation methods. The material description is based on the inhomogeneous and statistically distributed textile structure in the elastic and plastic range, taking into account manufacturing and operational defects and environmental influences such as temperature and humidity.

Institut für Leichtbau und Kunststofftechnik

Organisation type
University or higher education institution

Sectors

Employees
Up to 9

Turnover
Up to €2m

Funding
n/a

Holbeinstr. 3
01307 Dresden
Saxony
Germany
tu-dresden.de/ing/maschinenwesen/ilk/forschung/fachgruppe-materialmodelle



TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

About this organisation

Main areas covered	Mechanics of materials, Material models, Experimental diagnostic procedures, Impact and crash, Fatigue
Infrastructure	In-situ computer tomograph, Multi-axis dynamic testing machine, Materials physics laboratory, Shaker, In-house material models
Certifications	
Keywords	Fibre composite, Material models, Simulation, Damage models, Failure models
Memberships	

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Offer			
Products Software & databases, Materials	✓	✓	
Services & consulting Training, Consulting, Testing and trials, Standardisation, Validation, Simulation	✓	✓	

TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

Overview of lightweighting expertise

Machine translation

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

	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, Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Crash behaviour, Loads & stress, Life-cycle analysis, Optimisation, Processes, Structural mechanics, Materials, Reliability validation	✓	✓	
Plant construction & automation			
Recycling technologies			

TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing			
Coating (surface engineering)			
Fibre composite technology			
Forming			
Joining			
Material property alteration			
Primary forming			
Processing and separating			
Textile technology			

TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

Overview of lightweighting expertise

Machine translation

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

	Research	Development	Manufacturing & Supply
Material			
Biogenic materials Bioplastics, Biocomposites, Wood	✓	✓	
Cellular materials (foam materials)			
Composites Aramid fibre composites, Basalt fibre-reinforced plastic, Glass-fiber reinforced plastics (GFRP), Ceramic matrix composite (CMC), Carbon-fiber reinforced plastics (CFRP), Short fibre-reinforced concrete, Metal-fibre-polymer composite, Metal-ceramic composite, Metal matrix composite, Natural fibre reinforced plastics (NFRP), Laminates, Textile-reinforced concrete	✓	✓	
Fibres Aramid fibres, Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres, Metal fibres, Natural fibres	✓	✓	
Functional materials			
Metals Aluminium, Intermetallic alloys, Magnesium, Steel, Titanium	✓	✓	
Plastics Thermoset plastics, Elastomers, Thermoplastics	✓	✓	
Structural ceramics Non-oxidic ceramics, Oxidic ceramics	✓	✓	
(Technical) textiles Yarns, rovings, Meshes, Laid webs, Crocheted fabrics, Woven fabrics, Knitted fabrics	✓	✓	

TU Dresden, Institute of Lightweight Engineering and Polymer Technology

Specialist group material models

Contacts

Machine translation

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

Mr Dr.-Ing. Robert Böhm

Specialist group leader material models

robert.boehm1@tu-dresden.de