Helmholtz Centre Hereon

Institute of Mechanics of Materials - Department of Solid Phase Materials Processing

About this organisation

Machine translation

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

The Institute of Mechanics of Materials researches highly productive and energy-saving processes for the use of innovative lightweight materials and structures, particularly for the automotive and aerospace sectors, which make it possible to reduce component weight while ensuring safety. The spectrum ranges from joining technologies and additive processes to structural monitoring.

The "Solid Phase Material Processing" department deals with basic and applied research topics in the fields of solid phase joining, processing, application and extrusion. In this process, the material is heated by friction only to the point where it can be kneaded and moulded. Some of these processes, such as friction spot welding, were developed and patented at the centre. We develop new materials and processes for metallic lightweight materials, particularly with regard to sustainable use in the transport sector. To do this, we combine experimental activities with digital simulations. Only through these combined approaches can the complex interplay of process, microstructure and component properties be comprehensively understood.

Max-Planck-Str. 1
21502 Geesthacht
Schleswig-Holstein
Germany
www.hereon.de/institutes/materials_mechanics/solid_state_materials_processing/index.php.de

Organisation type
Non-university research institution

Sectors

Employees
500 and more

Turnover
n/a Öffentliche Forschung

Funding
n/a

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Main areas covered	Solid phase joining processes, Friction stir welding (FSW), Friction spot welding (RPS), Friction extrusion, Additive manufacturing
Infrastructure	FSW robots and portal systems, Friction point and friction application systems, Friction riveting systems, Metallography with SEM, Mechanical characterisation
Certifications	
Keywords	
Memberships	

Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
Offer			
Products Parts and components, Materials	✓	✓	
Services & consulting Consulting, Testing and trials, 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 Hybrid structures, Lightweight construction concepts	✓	✓	
Functional integration			
Measuring and testing technology Component and part analysis, Visual analysis (e.g. microscopy, metallography), Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
Modelling and simulation Multiphysics simulation, Processes, Materials	✓	✓	
Plant construction & automation			
Recycling technologies			

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	Research	Development	Manufacturing & Supply
Manufacturing process			
Additive manufacturing Others (Friction cladding)	✓	✓	
Coating (surface engineering)			
Fibre composite technology			
Forming Others (Friction extrusion)	✓	✓	
Joining Hybrid joining, Welding, Others (Friction stir welding, friction spot welding)	✓	✓	
Material property alteration Mechanical treatment, Thermochemical treatment, Thermomechanical treatment, Heat treatment	✓	✓	
Primary forming			
Processing and separating			
Textile technology			

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	Research	Development	Manufacturing & Supply
Material			
Biogenic materials			
Cellular materials (foam materials)			
Composites			
Fibres			
Functional materials			
Metals Aluminium, Magnesium, Steel, Titanium	✓	✓	
Plastics			
Structural ceramics			
(Technical) textiles			

Contacts

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Contacts

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