Processing fibres efficiently: sustainable seating systems for vehicles

About this project

RESOLVE

Processing fibres efficiently: sustainable seating systems for vehicles

Markets:

Material: Glass fibres, Others (Polyamide fibres), Thermoplastics, Laid webs, Woven fabrics, Glass-fiber reinforced plastics (GFRP)

This project is funded by the Technology Transfer Programme Leichtbau (TTP LB) of the Federal Ministry of Economics and Climate Action.

Technology Transfer Program Leichtbau

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Context

Continuous fibre-reinforced thermoplastic fibre composites are among the most innovative materials in lightweight construction. Their exceptional material properties, such as high strength and low weight, offer enormous potential for a climate-friendly industry. However, their industrial use has so far been limited, as high material costs and cutting rates make widespread use difficult. This means that considerable opportunities for conserving resources and reducing CO2-emissions remain untapped.

Purpose

The aim of RESOLVE is to overcome these hurdles through new technologies and optimised manufacturing processes. The researchers have optimised the fibre orientation of the continuous fibre-reinforced thermoplastic fibre composite materials so that they are ideally prefabricated for specific loads. Specifically, they have designed a modular seating system for trams to demonstrate the potential of these materials. These seats are particularly light, stable and resource-efficient. The project also aims to develop new bionic design approaches that can be used in various industries such as automotive, aviation and rail transport. This will enable a broad industrial application.

Procedure

The researchers are using what is known as effiLOAD technology. This makes it possible to place fibre materials in a "roll-to-roll" process in such a way that they follow the load paths precisely. As a result, significantly less material is lost, while efficiency and product quality increase at the same time. The project team is further refining this technology and combining it with bionic principles. The focus is on a complete process chain, from the manufacture of semi-finished products to component production and quality assurance. The tram seat concept serves as an application example to demonstrate the potential of the technology in a real product.

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Funding duration:

Funding sign: 03LB3002 **Funding amount:** EUR 1.1 million

Further websites foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB3002A - RESOLVE in the federal funding catalogue

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Project coordination

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English (EN){{ Projektpartner }}

Lightweighting classification

	Realisation
Offer	
Products Parts and components, Software & databases, Systems and end products, Tools and moulds	✓
Services & consulting Consulting, Engineering, Prototyping, Simulation	✓

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Lightweighting classification

	Realisation
Field of technology	
Design & layout Lightweight design, Lightweight construction concepts	✓
Functional integration Others (Load path integration)	✓
Measuring and testing technology Component and part analysis, Materials analysis	✓
Modelling and simulation Crash behaviour, Loads & stress	✓
Plant construction & automation Plant construction	✓
Recycling technologies	
Manufacturing process	
Additive manufacturing	
Coating (surface engineering)	
Fibre composite technology	
Forming Compression moulding	✓
Joining	
Material property alteration Heat treatment	✓
Primary forming	
Processing and separating	
Textile technology	

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Lightweighting classification

	Realisation
Material	
Biogenic materials	
Cellular materials (foam materials)	
Composites Glass-fiber reinforced plastics (GFRP)	✓
Fibres Glass fibres, Others (Polyamide fibres)	✓
Functional materials	
Metals	
Plastics Thermoplastics	✓
Structural ceramics	
(Technical) textiles Laid webs, Woven fabrics	✓