

Recycling and cleaning plastics: for recyclable battery housings

About this project



GABRIELA

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Markets:



Material:

Glass fibres, Carbon fibres, Thermoplastics, 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

With the "Green Deal", Europe is aiming to become climate-neutral by 2050. The recycling of plastics, in particular the use of reprocessed plastic waste, known as recyclates, is a key component of this.

Recyclates also play an important role in resource-efficient lightweight construction: the more recycled plastics are used in lightweight components, the more primary raw materials - and therefore CO₂ - can be saved.

However, one problem is that conventional mechanical recycling cannot sufficiently break down the material composite. It is unclear whether the shredded material is directly suitable as a recyclate or whether the material composite must be completely broken down.

Purpose

The researchers are using a high-voltage battery housing to investigate how recyclable battery housings can be manufactured. These housings are crucial for the protection of sensitive vehicle batteries and must therefore fulfil high safety requirements, for example in the event of side impacts and underride protection.

They are part of the vehicle's load-bearing structure and must bear a surface load of up to 500 kg through the battery modules. They also integrate complex functions such as battery cooling.

Procedure

The project team is investigating ways to make battery housings recyclable and recyclable. The researchers are relying on the new adaptive recycling technology CreaSolv[®], which uses solvents to recycle and clean plastics. This technology already enables the recycling of thermoplastic films.

The team is now working on transferring this method to the recycling of lightweight fibre composite structures, i.e. engineering plastics. The researchers are analysing the entire life cycle of a fibre-reinforced plastic battery housing across all stages of the value chain.

They are investigating the production and processing of the material, its ageing in use and the possibilities for recycling it so that it can ultimately be used again in the same component. With the prototype developed, the research team wants to demonstrate that the greenhouse gas-intensive primary plastic can also be replaced by recycled material for sophisticated components for electromobility.

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Funding duration:

Project partner:



Funding sign:

03LB3074

Funding amount:

EUR 2.4 million

Further websites

plattform-forel.de/gabriela/#partner - FOREL website for GABRIELA
foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB3074B - GABRIELA in the federal funding catalogue

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Project coordination

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Lightweighting classification

Realisation

Offer

Products

Materials



Services & consulting

Testing and trials, Prototyping, Validation,
Simulation, Technology transfer



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Lightweighting classification	
	Realisation
Field of technology	
<i>Design & layout</i>	
<i>Functional integration</i>	
Measuring and testing technology Materials analysis, Destructive analysis	✓
Modelling and simulation Loads & stress, Structural mechanics, Others (Simulation-based life cycle assessment and material flow management)	✓
<i>Plant construction & automation</i>	
Recycling technologies Recycling	✓
Manufacturing process	
<i>Additive manufacturing</i>	
<i>Coating (surface engineering)</i>	
Fibre composite technology Others (Thermoplast injection molding)	✓
<i>Forming</i>	
<i>Joining</i>	
Material property alteration Mechanical treatment, Thermochemical treatment	✓
Primary forming Injection moulding	✓
<i>Processing and separating</i>	
<i>Textile technology</i>	

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Lightweighting classification	
	Realisation
Material	
<i>Biogenic materials</i>	
<i>Cellular materials (foam materials)</i>	
Composites Glass-fiber reinforced plastics (GFRP)	✓
Fibres Glass fibres, Carbon fibres	✓
<i>Functional materials</i>	
<i>Metals</i>	
Plastics Thermoplastics	✓
<i>Structural ceramics</i>	
<i>(Technical) textiles</i>	