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1 Positioning of carbon-fiber-reinforced plastic (CFRP) samples in the microwave pyrolysis chamber before the experiment.

2 Recycled carbon fibers after microwave pyrolysis.



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Fraunhofer Institute for Chemical Technology ICT

Joseph-von-Fraunhofer-Straße 7
76327 Pfinztal

Contact

Dipl.-Ing. Elisa Seiler
Phone +49 721 4640-354
elisa.seiler@ict.fraunhofer.de

www.ict.fraunhofer.de



RETRO

DEVELOPMENT OF HYBRID MATERIALS FROM RECYCLED CARBON FIBERS FOR RESOURCE-EFFICIENT ELECTROMOBILITY

Starting point

The automotive industry is one of the leading economic sectors in Baden-Württemberg. A reliable and sustainable supply of raw materials is necessary to maintain high performance and ensure a competitive advantage in the future. Supporting this target, the Ministry of Finance and Economic Affairs of Baden-Württemberg launched a funding program for technological resource protection, in which context the RETRO project was initiated.

Objective and approach

The scientific and technical objectives of the project are the development of recycling and manufacturing processes for carbon fibers and the production of new materials for energy systems.

The focus is on the development of hybrid materials from recycled carbon fibers and polymers and their application in battery casings and as coatings for bipolar plates in redox-flow batteries and fuel cells.

The following issues will be addressed in the project:

- Development of microwave pyrolysis as a recycling technology for CFRP waste while also taking mechanical pre-treatment into account
- Product design based on material development and manufacturing of CFRP semi-finished products
- Quality assessment of the recycled carbon fibers and the newly developed materials
- Economic and ecological evaluation of the technology and assessment of the market potential

Innovation and perspectives

By supplying high-quality secondary raw materials such as carbon fibers, the project addresses the need for a sustainable supply of raw materials. Following the targets of a circular economy, resource-efficiency is enhanced, thanks to the re-use as a coating material for bipolar plates and battery boxes.

Through the networking of stakeholders from the recycling and electromobility sectors, further application fields and therefore more potential for resource-efficient electromobility can be identified.

Project coordinator

- Fraunhofer Institute for Chemical Technology ICT

Partner institutes

- Ministry of Finance and Economic Affairs of Baden-Württemberg
- Karlsruhe Institute of Technology (KIT), Institute for Applied Materials – Material Sciences
- University of Stuttgart, Chair for Building Physics

Industrial advisory board

- Fiber Engineering
- Dieffenbacher GmbH
- Cronimet Ferrolog GmbH
- E-Mobil BW GmbH

Project duration

August 2015 – December 2017

Funding agencies

Baden-Württemberg, Ministry of Finance and Economic Affairs



Baden-Württemberg

MINISTERIUM FÜR FINANZEN UND WIRTSCHAFT