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1, 2 *Fractions of shredded carbon fibers from the hammer and cutting mill.*
3 *Bulk moulding compound (BMC) made of carbon fiber patches.*

ReCaP

PROCESS DEVELOPMENT FOR RECYCLING CARBON FIBERS IN PRODUCTION

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Initial situation

Waste containing carbon fibers can be divided into wet waste (infiltrated with resin) and dry waste. Knowing if the waste is dry or wet is crucial for the later handling and treatment of the material. Dry waste e.g. is generated by fiber cutting (cut-off) during production, and constitute up to 50 wt.-% of a product.
To achieve significant reductions in resource consumption, more efficient manufacturing processes and also innovative methods to recycle carbon fibers in the production process are required. This is the objective of the research project reCaP, which is part of the funding program "Material efficiency in production" of the Baden-Württemberg Foundation GmbH.

Objective and approach

The project aim is the investigation and development of new concepts and processes to recycle dry carbon fiber waste in a new production process, and thus to reduce resource consumption without affecting the properties of produced CFRP components. Necessary steps to follow are:

- Basic investigations in mechanical treatment processes for dry fiber production waste
- Development of quality measurement methods for the recycled material
- Recycle the fibers by using the BMC process
- Simulation in the component
- Economic and ecological evaluation of the technologies over the entire life cycle

Results and outlook

Dry carbon fibers can be treated mechanically using varying parameters. In particular the stress impact during the comminution of the individual particles had been investigated. For the systematic investigation of quality in the CFRP component and the identification of the various influencing variables, material with different patch sizes have been processed and the material characteristics are determined. The bulk molding compound (BMC) process has been identified as a suitable fiber processing method.

Using the reCap approach previously unused Production waste can be made available as a secondary raw material, increasing the added value and consequently improves the energy and resource efficiency during the manufacturing of CFRP components.

Project coordinator

Fraunhofer Institute for Chemical Technology (ICT)

Partner institutes

Karlsruhe Institute of Technology (KIT), Institute for Applied Materials IAM-WK

Karlsruhe Institute of Technology (KIT), Institute of Vehicle System Technology FAST

Project duration

August 2015 – December 2017

Funding program

Material efficiency in production

Funded by

Baden-Württemberg Foundation GmbH