

Project RecyCarb — process optimisation and on-line monitoring in the recycling of carbon fibre waste for the re-use in sophisticated fibre-reinforced plastics.

Motivation and Aims

Within the frame of the research project RecyCarb a qualified value-added chain shall be initiated for recycled carbon fibres (rCF), enabling the high-quality and sustainable re-use in sophisticated fibre-reinforced plastics. The technological gap between actual rCF and the functional re-use has to be closed. This will be achieved by developments in all parts of the process chain, combined with the initiation of a reliable scheme of quality assurance. Based on this information, a monitoring system will be realised, comprising the whole process as required for industry 4.0.



Approach

A team consisting of two research institutes and four industrial partners is engaged in setting up a qualified value-added chain for recycled carbon fibres (rCF), enabling the high-quality and sustainable re-use in sophisticated fibre-reinforced plastics. In parallel, the technological gap has to be closed, which is existing between the actual rCF available at the market and the functional re-use as reinforcing elements in high-quality parts, e.g. as reinforcing elements in composite parts.

Raw Material



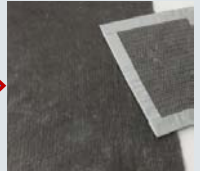
Processing



Nonwovens production



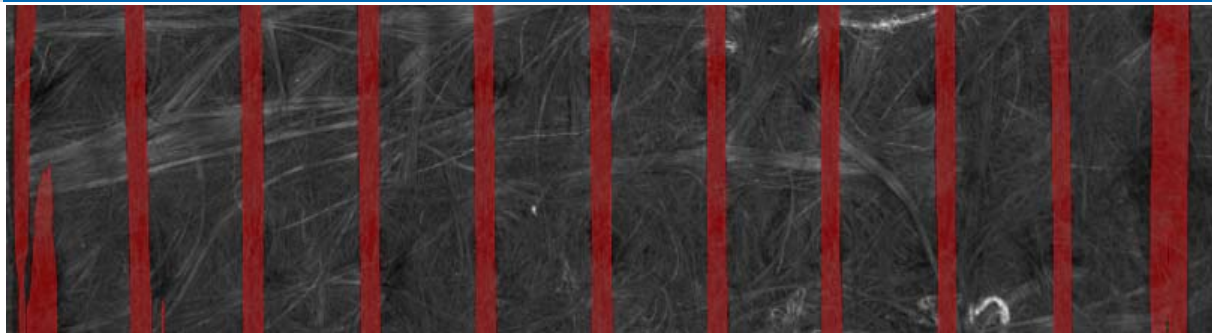
Products



Scheme of value-added chain from rCF raw material via processing and nonwovens production to product. Image source: © STFI.

The work packages comprise developments in all parts of the value-added chain, combined with setting up a reliable scheme of quality assurance as base of a monitoring system covering the whole process. Special focus of the project work is:

- Process scale-up for waste recovery and non-woven production into industrial and economical relevant scale with respect to the quality requirement
- Set-up of a process-integrated monitoring of quality parameters, starting with waste recovery and reaching to the high-quality re-use of rCF in suitable parts
- Evaluation of the effects of different non-woven technologies, first-time application of a combined non-woven process for generating quasi-isotropic non woven structures



- Specific application-oriented adaptation of technology and products to the different requirements of the target applications and potential end-users

The results will contribute to the largely preservation of fibre properties and functionality. This enables the multiple use and avoids downcycling of the energy-intensive produced carbon fibres.



Possible Applications

The project results will enable the high-quality and sustainable re-use of rCF in sophisticated fibre-reinforced plastics in the area of transportation, sports equipment or medical technology.

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 Competence field fibre- and material development

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Project Partners

- STFI Sächsisches Textilforschungsinstitut e.V.; Chemnitz, DE
- Autefa Solutions Germany GmbH; Friedberg, DE
- TENOWO GmbH; Hof, DE
- Eissmann Cotesa GmbH; Mittweida, DE
- Schmuhl FVT GmbH & Co. KG; Liebschütz, DE

Faserinstitut Bremen e.V.

The Faserinstitut Bremen e.V. is active in research and development tasks in areas of testing, development and processing of fibres, textile preforms and carbon fibre reinforced plastics. The [competence field fibre- and material development](#) focuses on the investigation of new fibres and manufacturing technologies. In the area of natural fibres the complete value-added chain from plant cultivation via fibre modification to application in technical products (e.g. natural fibre-reinforced plastics) is covered.

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