Univ.-Prof.
Prof. h.c. (Moscow State Univ.)
Dr.-Ing. Dipl.-Wirt. Ing.
Thomas Gries
Director

Ziwen Liu
Research assistant

Ref.: ZL
01.02.2023

Project title:	Development of a production technology to reduce carbon fibre costs by thermochemical pretreatment
Partner:	RWTH Aachen Institut für Textiltechnik, 3WIN Maschinenbau GmbH, Herberger Wasseraufbereitung GmbH, Marmara University, BCD Teknik ARGE ve Robotik Otomasyon San. Tic. Ltd. Şti.
Duration:	09/2022 – 08 2024
Funding Agency:	Federal Ministry for Economic Affairs and Climate Action

Mission Statement

The aim of this project is to develop an industrial production technology to reduce costs and energy requirements in the production of carbon fibres. This includes the development of an industry-oriented plant for the continuous thermochemical pretreatment of PAN (Polyacrylonitrile)-fibres and the development of a shortened thermal conversion process in the production of carbon fibres. The aim of this project is to reduce the process time by at least 25 % and to save 20 % of the energy required for stabilisation. Furthermore, a reduction of the total fibre costs by up to 10 % and an increase of the mechanical properties of the carbon fibres by 10 % are targeted.

Approach

To achieve the project goals, an innovative continuous process for the thermochemical treatment of a PAN precursor before stabilisation (pretreatment for short) is to be developed. The pretreatment leads to a prestabilisation as well as higher reaction rates of the PAN fibres in the stabilisation process, whereby up to two of the four necessary temperature zones can be saved. For the continuous pretreatment of a PAN precursor, a corresponding industry-oriented system is to be developed. This should enable pretreatment of the PAN precursor in different pretreatment media by means of a modular design and also simplify up-scaling to an industrial scale. For the application of the pretreatment process, the downstream stabilisation process has to be adapted. At the end of the project, a concept for large-scale industrial implementation will be developed.

Contact
ziwen.liu@ita.rwth-aachen.de