

## CF data carrier – Development of textile carbon fibre data carriers for storage and inductive/capacitive readout

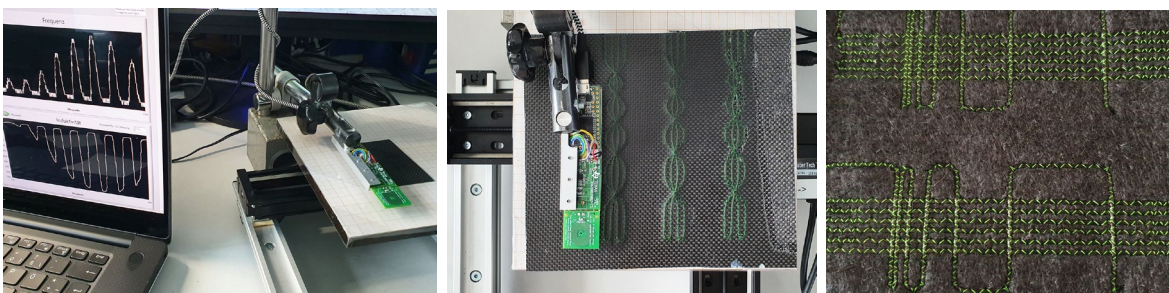
### Objective

Carbon fibres as reinforcement in fibre-reinforced plastics are currently the materials with the highest mechanical property potential in terms of stiffness and strength in relation to density. These outstanding properties are utilised in a wide variety of lightweight construction applications with a steadily increasing market volume. The aim of this project was to harness the electrical conductivity of carbon fibres in textile structures and laminates for impurity-free data storage with inductive or capacitive readout. The project took a completely new approach to implementing data storage directly in the material without RFID and therefore without foreign substances.



### Approach and results

The project was the first to demonstrate that the material component of the carbon fibre can also take on information storage and data readout functions in addition to its mechanical tasks in the component. This extends the basic design principle of functional integration to the area of data acquisition and processing in the age of Industry 4.0. With this development, the previous data storage via external materials is being converted to the principle of intrinsic data storage. The structures of the material itself are used to store information. The individual scientific requirements, such as the creation of the foundations of a digital writing code based on carbon fibres, the development and proof of function of inductive evaluation technology and the proof of contactless storage and readability, were met.



Measuring station for inductive data readout (left) and functional sample of a CF data carrier (centre and right)

INNO-KOM

Supported by:



on the basis of a decision by the German Bundestag

### Acknowledgement

We would like to thank the Federal Ministry for Economic Affairs and Climate Action for funding the research project CF data carrier (Reg. No. 49VF190026) within the funding programme "FuE-Förderung gemeinnütziger externer Industrieforschungseinrichtungen – Innovationskompetenz (INNO-KOM) – Vorlaufforschung (VF)".

The final report on this project is available on request.

www.stfi.de

Contact: Dipl.-Ing. (FH) Frank Weigand  
Dipl.-Ing. Elke Thiele

Phone: +49 371 5274-226  
Phone: +49 371 5274-243

Email: frank.weigand@stfi.de  
Email: elke.thiele@stfi.de

30/09/2022