TU Chemnitz, Research Group Textile Plastic Composites and Hybrid Compounds

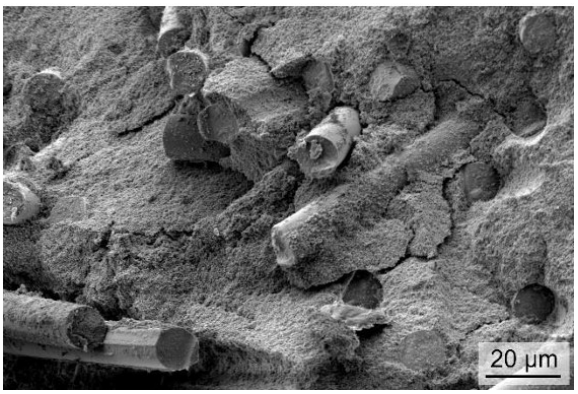
Die TU-Chemnitz forscht in verschiedenen Bereichen zu CMC und CFK. // The technical university Chemnitz conducts research into CMC and CFRP in various areas.

The TKV, which is associated with the Chair of Lightweight Structures and Polymer Technology (SLK) at Chemnitz University of Technology, has already been conducting research in the field of CMC for many years. In particular, the focus is on shaping processes suitable for large-scale production, which enable the fully automated, energy-efficient and resource-saving manufacture of complexly designed components.

In the case of non-oxide fiber-reinforced ceramics, the thermoset injection moulding process is used to process compounds containing carbon fibers and phenolic resins. By means of the liquid silicon infiltration (LSI) process, a carbon fiber reinforced ceramic based on silicon carbide (C/C-SiC) is formed as the final product (figure below, left). Development topics are currently

- various measures to increase the fiber length,
- the integration of inliners (textile semi-finished product or lost core) and
- the performance of sustainability analyses.

C/C-SiC brake discs for GoCarts via injection moulding and LSI @TUC-TKV



Fracture surface of a short fiber reinforced OFC @ TUC-TKV

For oxide CMC, the ceramic injection molding and the extrusion printing process are being adapted for manufacturing (figure below, right). Fiber-reinforced feedstocks are developed that are suitable for the molding. Further processing is performed by debinding and sintering. The focus of current research is on:

- the optimization of fiber-reinforced feedstocks,
- the integration of textile inliners and
- the adaptation of debinding and sintering parameters.