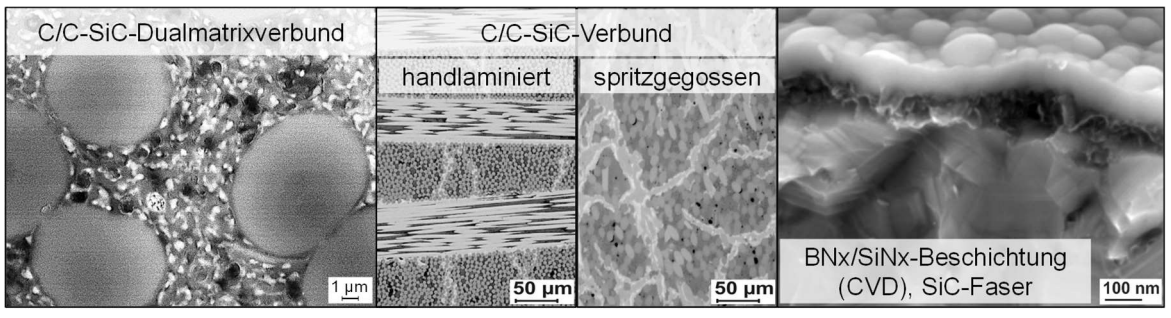
TU Chemnitz – Group of Composites and Material Compounds

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 CMC working team of the Composites and Material Compounds group has been conducting research in the field of carbon fiber-reinforced carbon composites (C/C) with subsequent siliconisation (C/C-SiC) for many years. These materials have excellent chemical, thermal and mechanical properties. A major focus is microstructure-correlated research into different manufacturing methods and process variations in the CFRP, C/C and C/C-SiC states. The working group is specifically concerned with:

- the research and development of adapted carbon precursors regarding porosity and processability,
- the LPI process (Liquid Polymer Infiltration) for the development of high temperature resistant C/C-SiC or C/C-SiCN composites,
- the LSI process (Liquid Silicon Infiltration) or field-assisted silicification (FAST-LSI) to provide high-temperature-resistant C/C-SiC composites,
- the large-scale production of C/C-SiC composites by using injection moulding as well as pultrusion as a shaping step,
- fiber/matrix interface adaptation by CVD coating,
- the further processing of CMC into hybrid components,
- the joining of CMC and finally
- the characterisation of CMC (e.g., microstructure, phase analysis by Raman microscopy, damping, mechanical testing in the SEM).

Another research focus is the coating of multifilament fibers by means of chemical vapour deposition (CVD). With this process it is possible to deposit uniform and homogeneous layers of Y2O3, BN and SiN as well as combinations thereof onto SiC multifilaments down to the core of a fiber bundle. In addition to discontinuous coating experiments for basic research, the CVD system technology is currently being expanded for



continuous coating of the fiber bundles to enable textile processing of the fibers.