

Research group Composites in Mechanical Engineering (THA_comp)

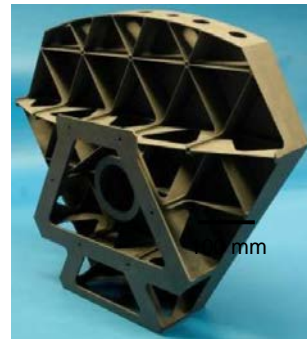
Machining and Surface Analysis of Ceramic Matrix Composites (CMC)

CMCs (Ceramic Matrix Composites) are a group of composite materials for high temperature, high chemical corrosion, and high load applications. These materials are typical, e.g., in aircraft turbine engine components, satellite mirrors (see Fig. 1) and sensor frames, high-performance car brakes, high-speed train emergency brakes, chemical pump sealings, and many more objects.

Final machining is challenging, not only due to the high value of these components but also because of efficiency and cost.



Fig.1: Satellite mirror out of CMC



*Fig. 2: Five-axis machining
Center for CMC Machining*

Scope of the internship

The scope of the internship is to learn about CMCs and their properties, as well as machining and surface analysis.

The host of the project is the Process Technology Lab of the research group "THA_comp". Here, machining experiments are carried out to optimize tools and processes to understand the impact on different CMC materials. On the machining side, cutting forces, tool life, and cutting data are acquired and evaluated using data science tools like AI and ML.

The material analysis comprises focus variation, 3D scan with laser and white light interferometry, mechanical testing, and Scanning electron microscopy.

Special requirements

The intern is interested in advanced materials and process technology and has some basic knowledge of material science, preferably ceramics and composites. AI and ML knowledge using PYTHON and MATLAB is a plus.

The intern works in the Technology Center Augsburg (TZA) and for some experiments in the THA University Campus.

Qualification level: Bachelor's Degree, preferred Master's Thesis

Program lines: SRI, A2S, BA/MA