

Fraunhofer Center for High Temperature Materials and Design HTL

Fraunhofer Center HTL ensures energy-efficient thermal processes and thus makes an important social contribution to the implementation of climate protection goals. It offers consulting, component and process development, sampling, measurements and special equipment. The primary goal is to implement its R&D results in industry.

Main Areas of Research

- Ceramics (oxide, non-oxide and silicate ceramics)
- CMCs (Ceramic Matrix Composites)
- Additive manufacturing (two-step processes)
- Textile processing of inorganic fibres
- Industrial thermal processes
- Materials testing (non-destructive, thermal and mechanical methods)
- ICME (Integrated Computational Materials Engineering)

Resources

Fraunhofer Center HTL currently employs around 90 people at its three locations in Bayreuth, Würzburg and Münchberg, organised into two business areas: »Materials and Components« and »Processes and Devices«.

A total of over 4700 m² of laboratory and pilot plant space with state-of-the-art equipment is available.

Material- and Component Development

At the HTL, materials and components are developed using systematic experimental and computer-based methods (ICME). The expertise ranges from component design, material selection and material design to process design, prototype and small series production as well as scale-up and product control.

Materials Competence

The materials competence focuses on ceramics and ceramic matrix composites (CMCs). As the only R&D facility in Europe, the HTL covers the complete technology chain for CMCs from fibre production to textile fibre processing and CMC manufacturing. It has highly automated pilot-scale facilities and offers customised materials and components.



Coils with ceramic reinforcing fibres



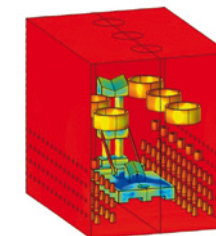
Prototype for a flower mixer made of low-cost CMCs

Thermal Processes

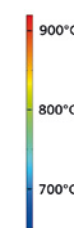
At the HTL, new furnace systems – based on digital twins – are developed and thermal treatment processes are designed or optimised. A special feature is that the input data for the computer simulation are obtained with specially developed ThermoOptical Measuring methods (TOM) and sensors, which significantly increases their reliability. In addition, the simulation results are validated with specially constructed high-temperature measuring systems.

Customised Device Construction

At the HTL, devices can be designed and built to customer specifications, including software development. Examples are thermoprocessing systems, feedstock processing systems, 3D printers and measuring devices for production control.



FE model of a loaded industrial furnace



ThermoOptical Measuring system TOM_wave



We have many years of expertise in the efficient and fair coordination of collaborative projects.«

Forms of Cooperation

Within the framework of the Fraunhofer-Gesellschaft, Fraunhofer Center HTL carries out R&D on behalf of companies and public institutions. The services are carefully coordinated with the client. They are specifically tailored to the respective need. A cooperation with us – whether small or extensive – aims at solving your problem and introducing your innovation into the company or the market.

The most common case of cooperation is the individual order. However, some problems are so complex that several partners have to contribute to the solution. For this purpose, we involve other Fraunhofer Institutes, external R&D facilities and other companies as needed. For larger development projects, public funding can be applied for. We are familiar with the funding landscape at state, federal and EU level and provide support in identifying suitable programmes and in the application process. Successfully completed projects often result in long-term partnerships with companies, which are supported on our side by key account managers.

Certification

Fraunhofer Center HTL
is certified acc. to ISO 9001:2015



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Center for High Temperature Materials and
Design HTL

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