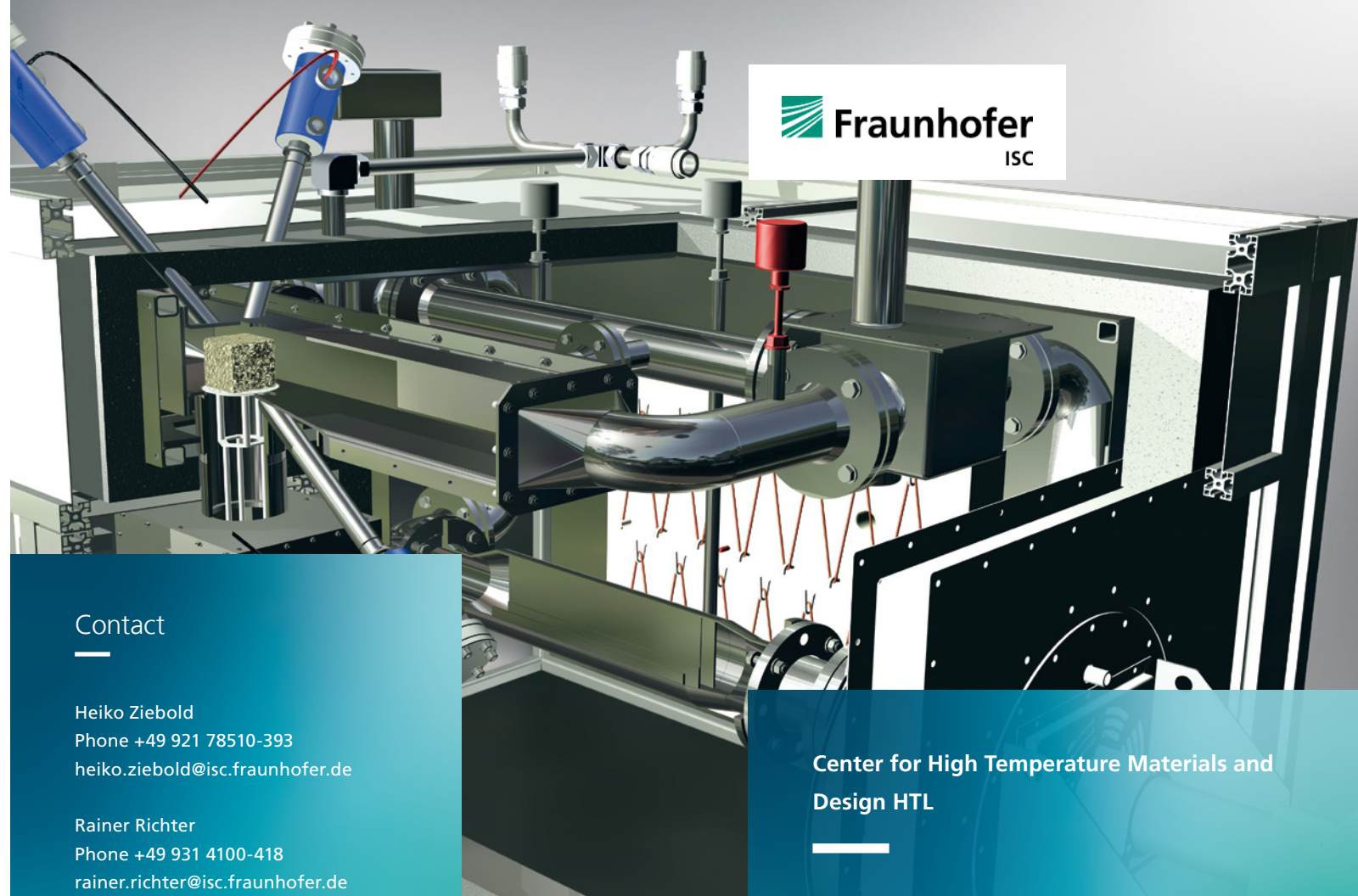
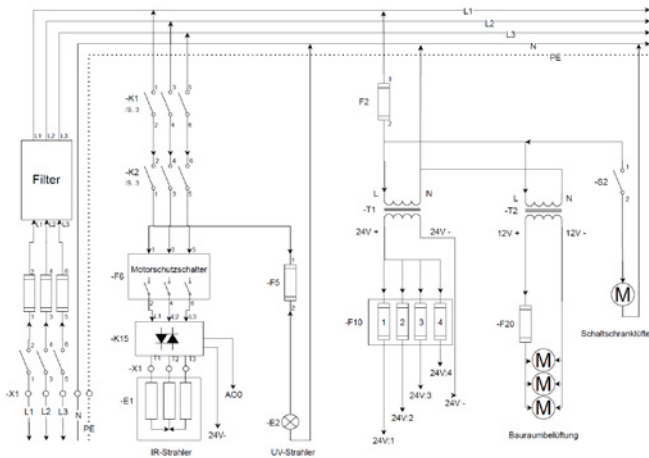


Service Offering

- Support in the project planning of thermal process devices
- Energy and material flow analyses of existing and newly conceptualized devices
- Design of device components
- Analysis and simulation of existing device components
- Optimization of thermal process devices with regard to efficiency and quality
- Safety assessment and documentation of CE conformity using the EN ISO 12100 standard and harmonized standards for new and existing devices
- Declaration of conformity according to DIN ISO 1750-1 for products, processes and devices
- Integration into existing SCADA or process control systems by using common communication protocols and interfaces (OPC-UA, Modbus, EtherCAT etc.)
- Measurement data acquisition, monitoring and logging also possible without higher-level system (stand-alone)



Contact

Heiko Ziebold
Phone +49 921 78510-393
heiko.ziebold@isc.fraunhofer.de

Rainer Richter
Phone +49 931 4100-418
rainer.richter@isc.fraunhofer.de

Fraunhofer-Center for High Temperature
Materials and Design HTL
Gottlieb-Keim-Straße 62
95448 Bayreuth
www.htl.fraunhofer.de

Center for High Temperature Materials and
Design HTL

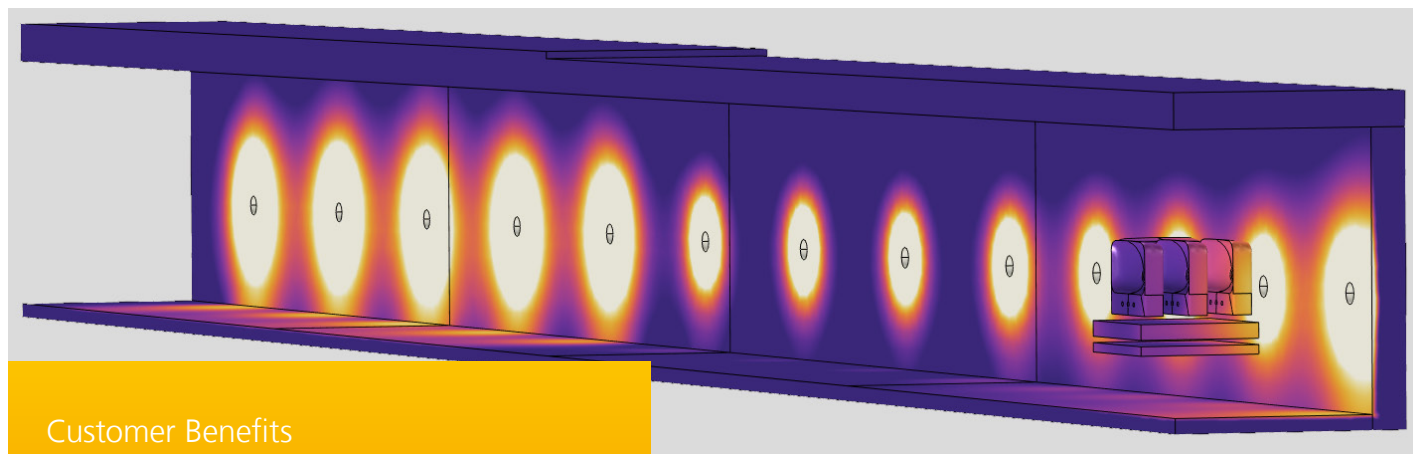
Project Planning of
Thermal Process Devices

Project Planning of Thermal Process Devices

The EU's climate protection targets and the rising cost of energy require more sustainable thermal treatment processes and corresponding industrial furnaces. Fraunhofer Center for High Temperature Materials and Design HTL offers its expertise in this area and, at the customer's request, carries out the planning and project management of energy-efficient thermal process devices. This includes all phases of project realization from conceptual design, environmental and safety planning, material and energy flow analyses, basic and detailed engineering, installation plans and visualization to specifications and bid review. The HTL can also provide support in device and process monitoring and the integration of systems into the production process through software selection, interface programming and sensor technology.



ThermoOptical Measuring System TOM_ac



Customer Benefits

Customers receive a manufacturer-independent planning of their thermal processes, including the expertise available at Fraunhofer Center HTL for thermal process optimization. If required, external providers are integrated into the project process.

Thermal Management

The generation of heat by burners or electric heaters and its transmission by convection, radiation and heat conduction are simulated at the HTL. The optimum heat input for the material to be heated is determined on the basis of in-situ measurements in laboratory furnaces and special computer simulations. Based on the material data, a digital furnace twin is created that takes into account the interaction between the material to be heated and the furnace. In this way, process parameters and furnace design are mutually optimized. On the one hand, energy efficiency is optimized, and on the other hand, reject rates can be minimized. Concepts for heat recovery are developed from the energy flow analysis.

Device Control

The digital furnace twin developed at the HTL can also be used to develop and test control concepts. The measured variables from different sensors are combined to control heaters and other manipulated variables for furnace operation. The interaction is simulated on the computer, for which AI algorithms are also used. Control schemes can be designed for fluctuating energy availability and flexible throughput. For real furnace operation sensors are selected to measure temperatures and gas composition, whereby sensors developed at the HTL also are available to measure thermal radiation and gas flow. The software for furnace control can be developed according to industry standards. Individual, customer-specific solutions are developed in consultation with the customer. All necessary settings are made available to appropriately trained personnel at different user levels. Thus, adjustments and optimizations of the processes by the customer are possible at any time.