

CORE COMPETENCIES OF FRAUNHOFER IKTS

MATERIALS AND SEMI-FINISHED PARTS

STRUCTURAL CERAMICS

- Oxide ceramics
- Non-oxide ceramics
- Hard metals and cermets
- Powders and suspensions
- Polymer ceramics
- Fiber composites
- Composite materials
- Ceramic foams

FUNCTIONAL CERAMICS

- Non-conducting materials
- Dielectrics
- Semiconductors
- Ion conductors
- Magnets
- Pastes and tapes
- Solders, brazes and glass sealings
- Precursor-based inks and nanoinks
- Composites

ENVIRONMENTAL AND PROCESS ENGINEERING

- Substrates**
 - Granulates
 - Plates
 - Tubes
 - Capillaries
 - Hollow fibers
 - Honeycombs
 - Foams
- Membranes and filters**
 - Oxides, non-oxides
 - Zeolites, carbon
 - MOF, ZIF, composites
 - Ion and mixed conductors
- Catalysts**
 - Oxides
 - Metals, CNT

RAW MATERIAL AND PROCESS ANALYSIS, MATERIALS DIAGNOSTICS, NON-DESTRUCTIVE EVALUATION

- Analysis and evaluation of raw materials**
 - Analysis of particles, suspensions and granulates
 - Chemical analysis
- In-process characterization in ceramic technology**
 - Characterization
 - Process simulation and design
 - Quality management

- Characterized materials**
 - Steel, non-ferrous metals
 - Ceramics, concrete
 - Materials of semiconductor industry
 - Plastics, composite materials (GFRP und CFRP)
 - Biomaterials and tissues

Process design, process monitoring

TECHNOLOGY

COMPONENTS AND SYSTEMS

Powder technology

Shaping

Heat treatment and sintering

Final machining

Precursor technology

Fiber technology

Additive manufacturing

Pilot production and upscaling

Coating technology

Joining technology

Thick-film technology

Multilayer

- HTCC, LTCC

Aerosol and inkjet-printing

Thin-film technology

Electrochemical machining

Galvanics

Materials separation

- Filtration
- Pervaporation
- Vapor permeation
- Gas separation
- Membrane extraction

Catalysis

Biomass technology

- Preparation
- Conversion

Photocatalysis

Chemical process engineering

Component design

Prototype production

Wear-resistant components

Tools

Optical components

Heating systems

Medical device technology and implants

Filters

System definition and plant development

Modeling and simulation

Design and prototype production

Validation/ CE marking

Test stand construction

Support in field tests

Samples and prototypes

- Membranes, filters
- Membrane modules
- Membrane plants

Filtration tests

- Laboratory, pilot, field
- Piloting

Modeling and simulation

- Materials transport
- Heat transport
- Reaction

Reactor development

Plant design

Material and component characterization

- Microstructure and phases
- Mechanical and physical properties
- High-temperature properties
- Corrosion

Component and system behavior

- Damage analysis
- Failure mechanisms
- Measurement and simulation of component behavior
- Testing in accordance with certified and non-certified standards

Technologies

- Micro- and nanoanalytics
- Ultrasound testing
- High-frequency eddy current
- Optical methods
- X-ray methods

Components, systems and services

- Sensors and sensor networks
- Testing heads and systems
- Structural health monitoring
- Data analysis and simulation
- Biomedical sensor systems
- Testing in accordance with certified and non-certified standards

Component behavior, reliability analysis, lifetime and quality management, calibration