DECENTRALIZED AND MOBILE ENERGY TECHNOLOGY

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Catalyst Development and Durability Testing

We have gained expertise in the preparation of catalyst coatings onto microchannels by wash-coating. Our catalyst development efforts have resulted in numerous catalyst formulations designed for reforming, catalytic combustion and CO clean-up, which have successfully passed 1,000 hours durability tests. An automated screen printing technique has been developed for mass production of coated metal foils.

Process Simulation, System Design and Control

Modelling and simulation are performed for efficient and optimized reactor and system design. We carry out static and dynamic ASPEN-Simulations of complete systems such as fuel processors.

System Integration and Testing

Our laboratories provide modern analytical equipment such as on-line gas-chromatography, mass spectrometry and FT-IR spectroscopy. Nine test benches are available for catalyst evaluation. Reactor and complete fuel processor testing is performed in dedicated test benches for the size ranges below and above one kilowatt. Modern CAD software, CFX simulation and ASPEN Dynamics modelling tools assist our physicists, chemists and chemical engineers in creating and designing tailor-made solutions for our customers.

Development of Cheap Fabrication Technologies

Reactor fabrication applies cost-efficient production techniques such as etching, embossing and laser welding. A 1 kW CW fiber laser is available at Fraunhofer ICT-IMM for reactor sealing.

ENERGY TECHNOLOGY BASED ON MICROTECHNOLOGY

The Decentralized and Mobile Energy Technology Department at Fraunhofer ICT-IMM develops energy systems of the future. Besides the development of reactors and complete reformer systems for conventional and regenerative fuels, we also work in the fields of liquid hydrogen technology, heat management, air conditioning systems and synthetic fuel synthesis.

FUEL PROCESSING AND HYDROGEN GENERATION

The integration of the fuel processor components to a complete, thermally integrated fuel processor is a critical step towards a marketable product. Compactness, maximum efficiency and low start-up time demand are major targets. We perform static and dynamic ASPEN-Simulations of complete fuel processors to achieve these targets.

We develop reformer systems from 100 W to 20 kW and upwards

CORE COMPETENCIES

We can provide you with all services required for component and system development.

- Feasibility studies
- Prototype design and manufacturing
- Catalyst stability testing
- Dynamic system modelling
- Catalyst development
- Basic engineering
- Fluid dynamics
- Tank inertization

Our microstructured components and services are used for manifold application areas.

- Aerospace
- Heavy goods vehicles
- Recreational vehicles
- Decentralized energy generation
- Bio-compatible reactors
- Heat management
- Exhaust gas purification
- Tank inertization