

Fuel Cells

Company Profile

The EBZ GmbH is an internationally operating specialist for SOFC testing and high temperature components. Based on our strong dedication to research and development we combine mature technology with leading inventions into our customised SOFC test rigs and BOP components.

The Advantages

Stacks from several manufacturers have been tested and integrated by EBZ since 2002. This expertise is basis for the design of our SOFC test rigs. Their application ranges from basic research up to close-to-system environments with reforming, heat recuperation and after burner.

Specialised components for heat and gas management are developed by EBZ and tested in the in-house laboratory. We offer solutions for high temperatures at small scale capacities. All components are optimised to work with minimal thermal and hydraulic losses. EBZ offers a wide range of standard products as well as customised solutions.



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Process Technology

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SOFC / SOEC System Research and Demonstration

EBZ integrates customer stacks into demonstration systems and offers demonstration systems with hotboxes. Due to our consistent modular design and the in-house developed BOP components, numerous parameters can be adapted to customers specification.

- complete 1 .. 3 kW_{el} SOFC systems
- integration of hotboxes from several suppliers
- start-up and afterburner
- evaporator for steam and autothermal reforming
- including control and safety system



SOFC / SOEC Demonstration Unit	
electrical power	500 W .. 20 kW
electrical efficiency (with steam reforming)	up to 45 % depending on stack performance
fuel supply	natural gas, LPG, biogas, synthetic gas mixtures
air supply	blower

SOFC / SOEC System Operation

- compact design for testing of stack hotboxes
- electrical gas heater
- electrically heated reforming and evaporation unit
- optional: recuperator and afterburner



SOFC / SOEC Test Rigs



- test rigs for tubular and planar cells
- modular concept to enable customised solutions
- testing up to 1000 °C using furnaces or hotboxes
- energy efficient long term testing with heat recuperation
- mechanical or pneumatical stack tensioning
- available with power feed-in or electronic load
- modular PLC with embedded real-time controller
- multiple stage safety management
- configurable threshold monitoring
- easy to operate with graphical user interface (GUI)
- programmable process control: EBZ ProControl
- remote access

EBZ SOFC / SOEC Test Rigs

single cell

stack

system alike

FZJ licensed cell housing

short stack

reformer

customer cell housing

stack

afterburner

EBZ cell housing

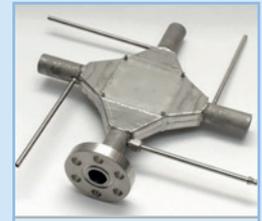
hotbox

heat recuperation

Heat & Gas Management

Heat Exchanger

- compact counter-flow, co-flow or cross-flow plate design
- maximum temperatures up to 950 °C



Gas Heater

- heat up of air and process gases
- gas temperatures up to 850 °C in a wide flow range



Humidification Unit

- bubbler, evaporator (electrical/thermal), membrane humidifier
- homogenous steam generation



Reformer

- precious metal or nickel catalysts
- integrated evaporator for homogenous steam supply



Desulphuriser

- two-parts vessel with permanent installation in the gas path
- easy adsorbent exchange



All Gas Porous Media Burner

- burning of low and high caloric gases
- 2-stage burning chamber for wide modulation range up to 1:10