

Häufig gestellte Fragen

staxera GmbH

What is staxera's business?

staxera supplies SOFC stacks to industrial manufacturers of SOFC systems.

Who are staxera's customers?

staxera supplies SOFC stacks to industrial customers such as Vaillant GmbH, Enerday GmbH, EBZ GmbH; as well as research institutes such as ECN, CUTEC, and NRC-Canada.

Which markets do the SOFC systems address?

Our customers develop SOFC systems for a variety of markets including microCHP for single family houses, off-grid electricity generation, or decentralized electricity generation.

What are staxera's products?

staxera supplies customized integrated stack modules (ISM's) for each customers specialized system requirements. New customers can purchase our standardized design, the ISM V3.3 with a power rating of 1.1 kW.

Do you offer a performance guarantee?

We offer a guarantee of 1000 hours and 20 thermal cycles if you operate the ISM within pre-defined parameters, such as below the maximum operating temperature. We will introduce higher lifetime guarantees as we gain more testing experience.

Do you offer service?

We are available to help you integrate the ISM into your system. Telephone contact is included in the price. On-site service costs €1.500 per day plus travel expenses. The ISM is designed to be robust, stable and easy to use.

staxera cannot deliver complete design concepts for commercial SOFC systems.

Integrated Stack Module (ISM)

How is the ISM different to a stack?

An ISM includes extra components such as thermal insulation, compression system, sensors and a robust housing, as well as the 60-cell stack. A particular feature is the sheet metal enclosure around the stack, which is critical for HAZOP and FMEA requirements.

What is the power of the ISM?

The ISM is rated at 1.1 kW at our reference operating condition of 75% gas utilization, with a stack voltage of 42 V (0.7 V/cell), and fuel gas of 40% hydrogen in nitrogen.

Do you offer higher power, such as 5 kW or 10 kW?

We are continually improving our products. In mid-2010 we intend to offer a 1.4 kW ISM. 3 kW and 5 kW ISM's are in the planning stage, and will be available in 2012-2013. If you need high power immediately, then it is possible to assemble multiple ISMs into one system, as EBZ have done with their 3 kW system demonstrator.

How much does an ISM cost?

Price is dependent upon volume. We offer discounts for larger orders. Please contact us by email for a quotation.

What is the normal delivery time?

Delivery is 6-8 weeks after we confirm your purchase order.

Can you reduce the ISM's volume?

Yes, customized designs can be made smaller, such as by removing the aluminium housing. Thermal insulation is a significant part of the volume.

How much does an ISM weigh?

This 1.1 kW ISM weighs approximately 65 kg. 24 kg for the stack, the rest for the tubing, thermal insulation, housing etc. This design is focussed on robustness and stability. Customized designs have options to reduce the weight.

What sort of fuels can the ISM use?

staxera's ISM must be integrated into a SOFC system, which processes the raw fuel into a hydrogen rich gas. Most hydrocarbon fuels can be used; such as biogas, natural gas, LPG, or diesel. SOFC stacks are not poisoned by carbon monoxide.

Can the ISM tolerate sulphur in the fuel gas?

Typically sulphur is removed by the fuel processing components of the SOFC system. Our test experience is not complete in this area. At present our results indicate that the ISM tolerate 4ppm sulphur in the gas phase without any problems.

What is the lifetime?

We have demonstrated a lifetime of over 10.000 hours with both our older Mk100 stack design and our actual Mk200 stack design, with a degradation of 0.4 % per 1.000 hours. We offer a guarantee of 1.000 hours if you operate the ISM within pre-defined parameters, such as below the maximum operating temperature. This guarantee will be increased as we gain more testing experience. The end product in production will have a lifetime of between 20.000 and 40.000 hours.

Vaillant and Callux

What is the Callux project?

Callux is a large scale field test of fuel cell microCHP systems for single family houses, supported by the German federal government. More information is available at their website www.callux.net.

Will the staxera ISM be part of the field tests?

Yes, the company Vaillant will be conducting field tests of their microCHP unit within the Callux demonstration project, and their system uses the staxera ISM. Please contact Vaillant for more information or visit their website www.callux.net.

Is there any possibility for end customers to take part in field tests?

staxera GmbH manufactures solid oxide fuel cell (SOFC) stacks; which for operation require integration into an SOFC system. For this reason the delivery of our products direct to end customers is not possible.

staxera supplies SOFC stacks to the boiler manufacturer Vaillant; for their micro-CHP development program. This micro-CHP system will be suitable for direct installation by end customers, in their own houses.

Vaillant will conduct field trials as one member of the Callux Project.

Vaillant Fuel Cell Hotline: 0180-5999210

Customers can provide their contact details and their enquiry will be answered by telephone or by post.

Further information is available from:

<http://www.vaillant.de>

<http://www.callux.net>

staxera and IKTS

What is the relationship between staxera and IKTS?

IKTS is staxera's research and development partner. IKTS develops new materials and processes which are used within staxera's SOFC stacks.

Examples include the cathode contact layer, the glass bonding elements, and the protective coating for the steel interconnector plates. staxera has exclusive rights to these materials.

Why has Fraunhofer IKTS been selected as the main R&D partner?

IKTS has pursued research in SOFC related areas since 1992. In 2003 IKTS was the only partner able to supply a functional stack to Webasto for system testing. After this milestone, the three-sided cooperation agreement between H.C. Starck, Webasto and IKTS was signed. The fast progress achieved towards a low cost stack concept lead to the decision to take the cooperation next step and to found a separate company for industrial manufacturing.

Why was staxera founded in Dresden?

Dresden offers one of Europe's largest and strongest fuel cell clusters; including companies such as EBZ, ezelleron and staxera; and institutes such as IKTS.

The strategic aims of the Fraunhofer IKTS, staxera GmbH and the State of Saxony complement each other well, with a combined focus on energy research.

staxera and Enerday / Webasto

What is the relationship between staxera, Enerday, and Webasto?

Both staxera GmbH and Enerday GmbH are 100% owned by Webasto AG. The formal structure is that staxera GmbH is 100% owned by Enerday GmbH. From the 1st December 2009 Dr Christian Wunderlich occupies the Chief Executive Office position at both staxera GmbH and Enerday GmbH.

staxera and Enerday are independent companies with different business models. staxera is world wide supplier of SOFC stacks to SOFC system developers. Enerday is one of staxera's customers.

staxera und H.C.Starck

What is the relationship between staxera and H.C. Starck?

H.C. Starck is a non-exclusive supplier of cells and ceramic components to staxera GmbH.

Introduction to fuel cells

What is a fuel cell, a stack or a fuel cell system?

In a fuel cell stack several single cells are electrically connected in series and supplemented with the necessary components for medium supply (fuel gas, air, partially separated cooling) to achieve a unit with the desired electrical power output.

This cell stack is then completed with additional components (fuel gas supply and preparation, afterburner, control and power electronics) to a complete system, where fuel is taken from a tank and electricity and heat are dissipated according to the application boundary conditions. H.C. Starck is a manufacturer of fuel cells, staxera GmbH is a manufacturer of fuel cell stacks and Webasto AG integrates the stacks into fuel cell systems.

A fuel cell stack represents approximately 30-50% of the total cost of a system, and the individual cells comprise approximately one third of the stack costs.

What electrical and thermal efficiency do ceramic high temperature fuel cells (SOFC) achieve?

The efficiency of SOFC stacks is dependent on the overall system, the system size and the available fuel. Diesel APU systems with less than 5kW power will achieve energy efficiencies of 25-30 percent. Stationary natural gas systems with (5-20 kW) power should reach electrical efficiencies of 35-55% and a total energy efficiency of 85-90%.

Do SOFC fuel cell systems need a reformer and gas preparation?

For most fuels types, SOFC systems require both a reformer and afterburner. However, these components are clearly simpler than for a standard engine, because hydrogen and carbon monoxide are fuel gases for SOFC and a complex cleaning of the gaseous fuel is not necessary. In addition, the stack and reformer operate at approximately the same temperature. Methane can be also processed within the SOFC systems.

What are the differences between SOFC and low temperature fuel cells?

A low temperature fuel cell (Polymer Exchange Membrane or PEM) is perfectly suited for clean hydrogen fuel. Preprocessing of fossil fuels like natural gas or propane to produce hydrogen for use in such a fuel cell is theoretically possible. However, we are convinced that this process is too complex and thus too expensive for commercial applications. Many system components are not available today. In contrast, the high temperature solid oxide fuel cell, not yet as advanced as current PEM stacks, will enable dramatically less complex and more cost efficient systems with high reliability for many fuels other than hydrogen. The application as the primary drivetrain for cars is not in focus, due to the limited dynamics and turn down ratios of SOFC systems.