

Hannover Fair 2005. An International Conference Hydrogen + Fuel Cells on Their Way to Commercialization

April 12th 2005 ■ Convention Center, Hannover Fair Fairgrounds



International industry leaders and executives from seven countries (Canada, USA, Japan, Korea, China, Norway, Island) will offer their insight on the commercialization results and future aspects in their particular regions. The official conference language is English.

• Dr. Seok Yeol Yoon, Vice President Corporate R&D, Samsung SDI will talk about the applications needed and the timeline towards mass production of mobile fuel cells.

• Dinghuan Shi, a highly ranked government representative from China, will present China's energy policies and the up-and-coming use of hydrogen and fuel cells, in the most populous country in the world.

• Knut Harg, Senior Vice President, Hydro Electrolyzer, will report about Utsira, an island in Norway that fully self sustains by renewable energies regenerating Hydrogen.

Every presentation will be followed by a 10 minute discussion between the speakers and the conference delegates. All speakers presentations will be wrapped up with a collective forecast for the future. Conference co-organizers, Arno A. Evers FAIR-PR and the Deutsche Messe AG, have added to the program the world's largest and most international exhibit on hydrogen and fuel cells. Located in Hall 13, minutes away from the Congress Centre, delegates can meet together with top level representatives of the more than 90 exhibiting companies and institutions representing 20 countries. Many of the topics spoken of at the conference will be on demonstration.

Conference attendee are also invited to attend the "Networking Evening" organized by Arno Evers and his FAIR-PR team, April 12th. Conference members will have the opportunity to meet and exchange information with all international exhibitors while having a dinner and drinks in an informal setting.

This year is the 11th consecutive year that the Group Exhibit "Hydrogen and Fuel Cells" takes place with the motto "Go to where the Market is!" The organizer Arno A. Evers said, "Only here in Hannover will you meet so many international companies exhibiting this theme, mostly represented by their founder or owners, their CEO's, research and development directors or high ranking managers. Take this chance and convince yourself, you can already start by looking at our website www.fair-pr.com!"

To register contact Andrea Busch, Deutsche Messe AG, at andrea.busch@messe.de.

For more information, contact Arno A. Evers FAIR-PR, at arno@fair-pr.com or www.fair-pr.com.

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At Hannover Fair 2005, April 11-15, more than 6,000 international exhibitors were visited by 205,000 trade show attendees from all over the world. There were 117 exhibitors and forum participants from 21 countries at Hydrogen + Fuel Cells group exhibit, organized by Arno Evers. Fuel Cell magazine has put together some of the highlights at this years event. For information on the Hydrogen + Fuel Cells exhibit, visit www.fair-pr.com.



The ENV Bike

The ENV (emissions neutral vehicle) bike, developed by Seymourpowell, has been engineered and based around Intelligent Energy's Core fuel cell. The Core, which is completely detachable from the bike, is a radically compact and efficient fuel cell, capable of powering anything from a motorboat to a small domestic property. On a full tank, the ENV bike could be used continually for up to four hours without any need for re-fuelling. In an urban or off-road environment, it can reach speeds of 50 mph.

At its heart is a fully-integrated 1 kW fuel cell generator providing power on demand directly to the drive-train. To enhance performance during peak power demand, the fuel cell is hybridized with a battery pack to provide a 6 kW peak load to the motor. The result is a balanced hybrid concept that combines the main advantages of Intelligent Energy's Core fuel cell, hydrogen storage and battery technology.

For more information circle 11 or visit www.fuelcell-magazine.com/f-service.htm

MILAN F-Cell Test Stands for Fuel Cells

To constantly optimize and improve fuel cell technology flexible testing concepts are necessary for broadly assessing fuel cells under varying ancillary conditions. Magnum's Test Stands considerably contribute to increasing the efficiency and reducing costs in the devel-

opment stage. Besides the automated control of the inspection process and the manual operation, the most prominent feature of the MILAN F-Cell test series is the possibility to integrate hardware-in-the loop simulations.

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MILAN F-Cell test systems are compact and efficiently evaluating fuel cells with different ranges of performance.

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The Celtec Technology for Fuel Cells

PEMEAS is a global technology provider for fuel cell components. Its Celtec products reduce costs for the production and operation of fuel cells. Celtec products, developed and manufactured by PEMEAS, will enable the success of fuel cells in promising future markets. In the future, fuel cells operated with PEMEAS components



will provide electronic devices such as computers with portable power, households with electricity and heat, and, in the longer term, trucks and cars with electrical energy.

At the heart of the PEM fuel cell is a membrane coated with precious metal (membrane electrode assemblies -MEAs). Within the MEA, hydrogen and air react to form water, generating electricity and heat. Celtec-MEAs enable reliable, efficient and cost-

effective systems needing considerably fewer components than conventional polymer electrolyte membrane (PEM) fuel cells, and operate in a broader temperature range. Due to the high operation temperature, it is no longer necessary to humidify the membrane, and it is easier to cool the system and to purify the hydrogen gas. In addition, the high operation temperature is suited for use in households, as it enables the cost-effective generation of electricity and heat.

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Hear Gordon Calundann with PEMEAS present at

Fuel Cell 2005

Conference & Exhibit on Advancements in Fuel Cell Applications & Technology

Weather-Resistant Miniature Fuel Cells And Durable SOFC Stacks

The newest Fraunhofer developments in hydrogen technology were seen at the Hydrogen + Fuel Cells Stand at the Hannover Trade Fair. The Fraunhofer Institute for Ceramic Technologies and Sintered Materials IKTS displayed durable SOFC stacks with a power of 1 kW_{el}. The fuel cells are intended for application in distributed power supplies and can be operated with either fossil fuels or biogas.

Widespread application of high-temperature solid oxide fuel cells SOFC in decentralized power supplies demands that the long-term stability and the electric contacts in the cathode chamber be improved, and that the currently high costs be reduced. Fraunhofer IKTS has been conducting research on SOFC for more than ten years and can now present stacks with a power of 1 kW_{el} which

have a predicted lifetime of 40,000 hours. The high overall efficiency value of the SOFC, around 80 percent, is a particular advantage.

In distributed applications in combined heat and power CHP systems, stack units in the power range between 1 and 5 kW_{el} are needed. The remaining system components are responsible for purification and supply of the fuel gas, distribution and use of the heat, and voltage conversion to 220 VAC. These systems are designed for electricity and heat cogeneration in free-standing houses and apartment blocks, with only natural gas or biogas being required as the primary energy source.

Fraunhofer ISE is developing miniature fuel cell systems in the low power range and recently extended their application range to extreme operating temperatures and air humidity values. Outdoor temperatures below freezing and high summer temperatures around 40°C present additional challenges to the researchers. Because the reaction moisture in the fuel cell freezes and forms ice at low temperatures, and on the other hand, the membrane-electrode assembly dries out at high temperatures, it has not been possible previously to operate fuel cells under these conditions. Fraunhofer ISE has now succeeded in reproducing these extreme operating conditions in a fully automated fuel cell test stand with an integrated climatic chamber, allowing appropriate solutions to be developed. By guiding hot and cold air currents through the novel casing, the system heating or cooling is supported as required. With the help of innovative microprocessor controls, the fuel cell system can now start reliably at -20°C and still operate safely at temperatures to above 40°C.

For more information circle 14 or visit www.fuelcell-magazine.com/f-service.htm

Nuvera Announces Sale of New Fuel Cell System

Nuvera Fuel Cells, Inc. began accepting orders for its new 5 kW PowerFlow hydrogen fuel cell system at the 2005 Hannover Fair taking place in Hannover, Germany. PowerFlow is being offered to OEMs for use in stationary or mobile applications or to customers who wish to test Nuvera's latest fuel cell technology. Application pre-approval is required.

In response to market needs, PowerFlow was designed as a complete, fully automated fuel cell system to be installed into industrial vehicles and equipment for a variety of applications, such as material handling, ground support equipment, powered access, turf care, construction, mining, forestry and utility vehicles. It is a compact, flexible system that features proven direct water injection technology, resulting in operational simplicity, fewer balance-of-plant components than standard fuel cell systems and high reliability. In addition, PowerFlow incorporates metallic bipolar plates to ensure low production costs and resistance to shock and vibration.

For more information circle 15 or visit www.fuelcell-magazine.com/f-service.htm

Making Hydrogen a Safe Fuel

The H2 Sensormodule from MST Technology, is an intelligent sensing technology for the detection of hydrogen in fuel cell applications or any other hydrogen-related application.

The intelligent MST H2 Sensormodule is used for the detection of hydrogen, not only in mobile but also stationary applications. The H2 Sensormodule uses an electrochemical electrode sensor developed by MST Technology. The main features of the sensor are a wide measuring range of up to 4 percent Vol. H2 and a wide temperature range

from -20°C to 80°C. The sensor works with a specifically designed electronic circuit providing reliable performance and extremely low power consumption. The H2 Sensormodule is available with three different electronic interfaces which allow for the adaptation in nearly every application.

The H2 Sensormodule's small size and low power consumption makes it unique in a market that looks for solutions for the future.

To complete the Sensormodule's optimal detection of hydrogen leakage, MST Technology offers the Sensormodule Control Unit for further control of the safety related signals.

The Sensormodule Control Unit is a small control device offering a LCD display showing the sensors actual hydrogen concentration value and a visual and acoustical indication when a preset alarm level is exceeded. The unit features one relay contact for each low and high alarm and may handle up to seven Sensormodules.

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SOLUPOR for PEM Fuel Cells

As the advent of the fuel cell begins to transform the energy industry, manufacturers are continuously seeking new ways of achieving a competitive edge in this rapidly changing and highly competitive environment. One material that is helping them to meet those demands is DSM's SOLUPOR.

Micro-porous SOLUPOR is the result of many years of experience in developing micro-porous film technology, combined with a deep understanding of market requirements. Comprising ultra-high molecular weight polyethylene with high porosity, it is extremely lightweight and yet its structural properties give it great mechanical strength.

SOLUPOR is strong, stable, highly porous and thin. Moreover, it has excellent wettability, absorption and lateral diffusion.

Compared with other membranes it is strong and responsible for reduced expansion by water absorption, thus increasing longevity.

In manufacturing terms, it forms an excellent web for a filling ionomer, which results in a composite membrane. Almost any



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Company Profile

Advertisement



Parker Hannifin Corporation is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of commercial, mobile, industrial and aerospace markets. Parker is well positioned to advance the commercialization of fuel cells with cathode air compressors, hydrogen circulators, flexible stainless steel tubing, filtration products, control valves, liquid pumps, air dryers, pressure regulators & transducers, positioning tables, PEM fuel cell stack components, seals, manifolds, fittings and tubing. Additionally, Parker has the engineering resources to design and manufacture custom products and integrated subsystems through its Fuel Cell Systems Business Unit in New Britain, CT.

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ionomer is permissible. Even ionomers with inherently poor mechanical properties can be used successfully. Membranes as thin as 25 μm can be designed to match performance requirements and can be handled without problems.

SOLUPOR is a non-elastic film, which makes it easy to handle in coating, impregnating and laminating processes. Typical bonding conditions for SOLUPOR-based composite membranes using a press are 60 bar for two to three minutes at 140 ±5 °C.

For more information circle 17 or visit www.fuelcell-magazine.com/f-service.htm



Single Cell Test Station

Helion has introduced the PEM-type single-cell test station. Running in a hydrogen-oxygen or hydrogen-air mode, the cell test station provides all the functions required to safely ensure a broad range of tests.

For membrane characterization tests, instrumented plates allow voltage and temperature measurements. Temperature may be increased via heating materials. Cooling is ensured by outer fans. The cell is isolated from the operator and monitored by a hydrogen detector.

For configuration tests in pure or diluted gas, flow rate of gases, stored and treated upstream the cell, as well as pressure and temperature are measured and recorded. Gases humidification is performed by a bubbling device with temperature control. Single-cell gases outlet is controlled by solenoid valves.

The test station meets the European guidelines and has the EC compliance mark.

For more information circle 18 or visit www.fuelcell-magazine.com/f-service.htm

IdaTech Unveils Portable Power System

IdaTech, LLC has unveiled its latest portfolio of products and services, including its new portable power fuel cell system. IdaTech is now taking advanced inquiries for the first test and evaluation units.

IdaTech continues to pursue a wide range of high value fuel cell applications and markets as it expands its capabilities and partner network. This year IdaTech further extends that reach to include its portable power system providing 250 watt AC

and DC. The system operates on a methanol-water fuel that can be derived from renewable sources, with an onboard reformer in a compact and lightweight package that can be hand-carried. The entire system weighs about 9 kg (20 lbs) and is smaller than a small desktop computer. Additionally, IdaTech continues to offer solutions for backup power, solar-fuel cell power, combined heat and power (CHP) and liquid hydrocarbon systems.

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