

## THE WINNERS OF THE DWV INNOVATION AWARD

### THESES ON MINIATURE FUEL CELLS AND ADVANCED AIRCRAFTS SELECTED

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**For the first time the DWV Innovation Award for Hydrogen and Fuel Cells was split this year into two classes for Diploma and Doctor theses. The winner for the Doctor thesis is Dr. Andreas Schmitz from Bad Kreuznach, now Leuven (Belgium), for the Diploma thesis Mrs. Julika Bleil from Hamburg.**

#### 1.1 ADVANCES TOWARDS PORTABLE ELECTRONICS RUNNING ON FUEL CELLS

Andreas Schmitz made his thesis titled „System Development of Miniaturised Planar Selfbreathing PEMFC: Simulation, Characterisation and Construction“ at the Technical University of Berlin. It comprises a new concept of a miniaturized PEM fuel cell running on hydrogen. Its particular features are the planar design, the selfbreathing operation of the cathode side, and the serial connection in the plane. Prototypes which are already close to serial production were manufactured by means of printed circuit technology and characterized. The possibility to manufacture this cell type by common mass production technologies like printed circuit technology opens the prospect to make planar fuel cells at low costs. Important aspects of the know-how gained were patented and thus saved for industrial cooperations. Apart from the technological aspects the thesis comprises a simulation model which makes it possible to verify the domain of validity on the basis of extensive experimental characterization. The model is particularly suitable as optimisation tool for selfbreathing PEM fuel cells. Development and research for the thesis were performed at the Fraunhofer institutes for Solar Energy Systems (ISE, Freiburg) and for Reliability and Micro Integration (IZM, Berlin).

#### 1.2 HYDROGEN AND FUEL CELLS AIRBORN

Julika Bleil made her thesis „New energy systems for future aircrafts“ at Airbus in Hamburg and had her scientific basis at the Technical University Hamburg-Harburg. It is about the integration of the fuel cell into a passenger aircraft. Modern planes comprise electrical, hydraulical, and pneumatical energy grids for the supply of the different systems. New concepts tend to replace more and more hydraulical and pneumatical consumers by electrical ones. Over the years Airbus developed different ideas how to integrate sustainable and future technologies like hydrogen and fuel cells into the passenger aircraft. But in order to make really efficient use of the fuel cell it is not enough to simply replace one power generator by another, but the whole pattern of energy and mass flows (water, nitrogen enhanced air, waste heat) must be considered. Cogeneration on board, from the coffee machine to wing de-icing, is something really new.

#### 1.3 INVITATION TO AWARD PRESENTATION

The public presentation of the awards, including short reports of the winners about their work, will be held in the afternoon of 18. May 2006 in Hamburg. This is done in conjunction with the

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annual meeting of DWV members in the building of Vattenfall AG (Ueberseering). Starting at 13:30 there will be a program of presentations to which the public is invited.

Apart from the award presentation the program comprises a report about „The hydrogen and fuel cell strategy of the Federal Government“ by a representative of the Federal Transport Ministry, a presentation about the development of a „Hydrogen Technology“ course in Dresden and a review of ten years of DWV existence and a look forward.

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