



**Danish Power Systems®**

**HTPEM**

**Fuel Cell Technology**



## **Company Profile**

Danish Power Systems specializes in the development and manufacture of the core component of fuel cells, the membrane electrode assembly (MEA).

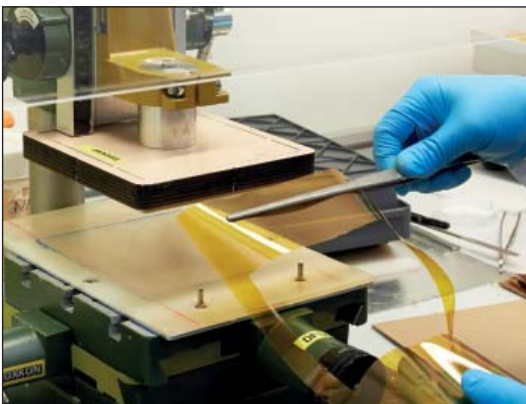
HTPEM (High Temperature Polymer Electrolyte Membrane) fuel cells can use all fuels – methanol, diesel, natural gas - that can be converted into a hydrogen containing gas. The conversion is performed through a reformer.

The fuel cells are operated at 140-180°C. At this temperature the catalyst is highly active and not poisoned by impurities in the fuel, e.g. carbon monoxide. This is made possible by using PBI (polybenzimidazole) as the ionic conducting membrane material. PBI is a thermally highly resistant material and less expensive than the membrane materials used for traditional PEM fuel cells.

The higher temperature eliminates problems associated to the water balance and facilitates less system complexity. Surplus heat from the fuel cells can be used for further electricity generation and heating or cooling purposes due to the high temperature.

The MEAs can be manufactured in many different sizes depending on the customer requirements.

We always have the customer in focus, and we believe that collaboration and good relations are of crucial importance for the deployment of the HTPEM fuel cells.



## Products

### Dapozol® Membranes

Dapozol® membranes produced from high molecular weight polybenzimidazole (PBI)  
Research on chemical and physical modifications for improvement of the membrane properties:

- Synthesis of PBI and derivatives
- Cross-linking
- Blends
- Composites

### Dapozol® Membrane Electrode Assemblies

Production of Dapozol® MEA's for HTPEM with an area in the range of 10 - 400 cm<sup>2</sup>  
Characteristics:

- Pt based catalysts
- Carbon based electrode material
- Edge reinforcement for easy implementation

### Membrane and MEA Performance

Acid doped membranes with excellent chemical, thermal and mechanical stability  
High proton conductivity at 140-200°C and nearly zero water drag:

- Temperature of operation up to 200°C
- No humidification required
- Very high CO tolerance above 150°C

MEA lifetime and durability:

- > 15,000 hours by continuous operation
- > 140 start-up cycles during 7,000 hours

### Our special competencies

Electrode materials

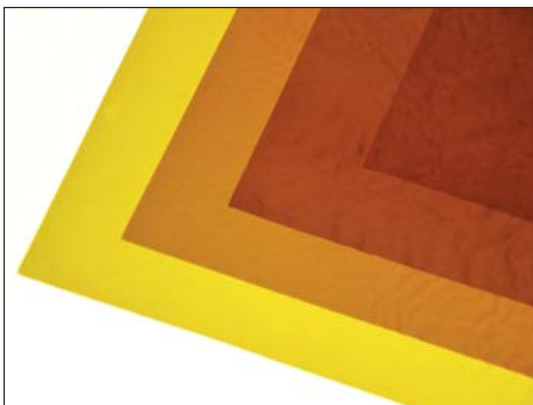
Membrane materials

Electrolysis components

Materials science in general

Training

Consultancy





# Danish Power Systems®

The High Temperature PEM fuel cell technology delivers clean energy and very high efficiency. Danish Power Systems delivers world class and customised critical MEA components. Danish Power Systems is a research based production company founded in 1994, working in the fields of energy and chemistry. Our mission is to promote and develop environmentally sustainable technology to the benefit of our business partners.

Danish Power Systems is a member of:

- The Danish Partnership for Hydrogen and Fuel Cells
- The Danish Academy of Technical Sciences
- Confederation of Danish Industry
- Network Brennstoffzelle & Wasserstoff NRW
- American Chemical Society
- The Electrochemical Society
- Materials Research Society
- Korean Electrochemical Society
- The New Energy World Industri Grouping (NEW-IG)

*Danish Power Systems, the DPS-logo and Dapozol® are registered trade marks.*

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