Engineering of gas humidifiers for polymer electrolyte fuel cells

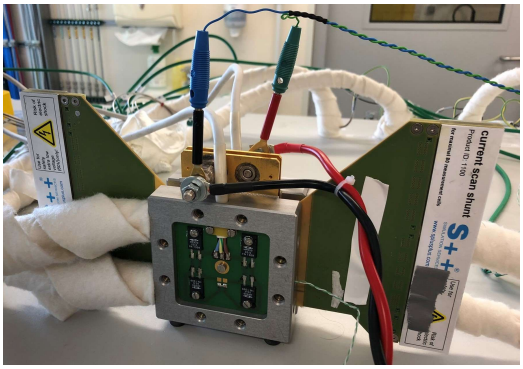
Topic suitable for Bachelor's/ Construction/ Master's Thesis

In the Fuel Cell & Hydrogen research group at CEET, you can become part of a team of experienced researchers, PhD students and motivated Master students with expertise in materials preparation, electrochemistry and cell characterisation. The institute has a fully equipped electrochemical laboratory with the necessary infrastructure for the planned experimental work.

PEFCs are gaining public interest for providing locally highly efficient and emission-free electrical energy. A core element is the polymer electrolyte membrane (PEM). The ability of the PEM to transport protons from the anode to the cathode and hence, the performance of the PEMFC, is heaviliy determined by the water content of the membrane. To control this, **precise gas humidification** is of primary importance, even under rapidly changing operating conditions (gas flow rate, pressure).

Within this work, an improved humidification system for single cell PEFCs will be developed and tested. **Working packages are:**

- Literature research and comparison of existing humidification systems.
- Operate and evaluate available hardware.
- Self-design and validiation of a humidification system.



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