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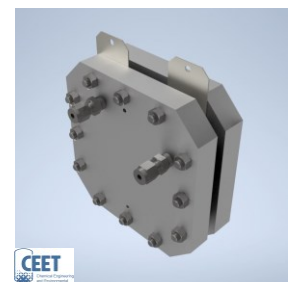
Component specific Modelling and Degradation Analysis of a PEMWE Cell

Hydrogen as an environmentally friendly energy carrier is attracting more and more interest as fuel suitable for low-emission power generation. Proton exchange membrane water electrolysis (PEMWE) is a highly efficient technology for the generation of renewable (green) hydrogen. The lifetime of this new technology is limited by the degradation of the materials used and the associated continuous deterioration of cell performance.

The aim of this thesis is the development of a **component-specific model** to evaluate the **suitability of novel materials in long-term studies** of PEM water electrolysis.

The student's tasks include:

- Research on suitable model concepts for PEMWE
- Performance simulations at varying operating conditions (temperature, current density, voltage)
- Development of a degradation model to study the material behaviour (e.g., corrosion)
- Experimental model validation



3D model of a PEMWE single cell

Basic knowledge of **MATLAB/Simulink** or similar is required.

In the Fuel Cell & Hydrogen Working Group at CEET, you can become part of a team of experienced researchers, PhD students with expertise in materials preparation, electrochemistry, and cell characterization, as well as other motivated master students. The research group has access to a fully equipped laboratory with the necessary infrastructure for the planned experimental work.

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