

## Production of In-plane Gradients for Catalyst Layers for Fuel Cells and Electrolyzers

Mechanical Engineering, Chemical Engineering or related fields...

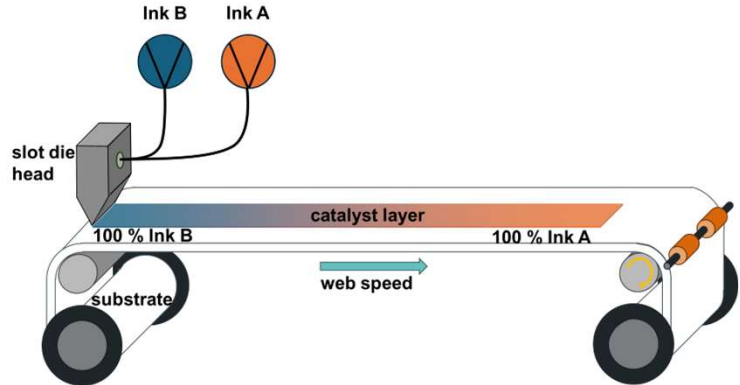
### The Challenge

Electrolyzers and fuel cells are an essential part of our energy transition to renewable resources. New catalyst materials are needed to develop more efficient systems. To produce an optimal electrode out of a new catalyst material is currently a time-consuming manual lab work due to the high number of different parameters.

At HI ERN we derive a High-Throughput approach for scanning of different catalyst layer compositions via in-plane graded catalyst layers. The idea is to mix two inks with different compositions via differential pumping. Via an inline mixing unit a graded catalyst coating emerges which then can be used to optimize electrode properties.

### Your Tasks

- ▶ Literature study about graded catalyst layers for PEMFC and PEMWE
- ▶ Investigation of different inline mixing concepts for catalyst inks
- ▶ Rheological study of catalyst inks
- ▶ Fabrication of in-plane graded coatings via differential pumping
- ▶ Characterization for verification of in-plane gradients via inline laser-profilometry, x-ray fluorescence, ...
- ▶ Electrochemical characterization in PEMFC full cells



### We Offer

- ▶ Outstanding working conditions in an interdisciplinary team of motivated young researchers
- ▶ Freedom to test ideas and extend beyond the scope
- ▶ Industry applicable experience
- ▶ Being a part of a German project on acceleration of renewable energy research
- ▶ Working at our site in Erlangen (Cauerstraße 1) along with flexible working hours (within legal limitations)
- ▶ Home-office option for non-experimental parts
- ▶ Master's thesis can be written in German or English

### Your Profile

- ▶ Student of Chemical Engineering, Process Engineering, Mechanical Engineering or related field...
- ▶ DIY mindset
- ▶ Ability to work independently
- ▶ Experience in lab work
- ▶ Experience in one of the following fields would be good:
  - ▶ Rheology/ Mixing technology
  - ▶ Fluid dynamics
  - ▶ Coating technology

For applications\* and questions:

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\*please attach a cover letter along with your transcript