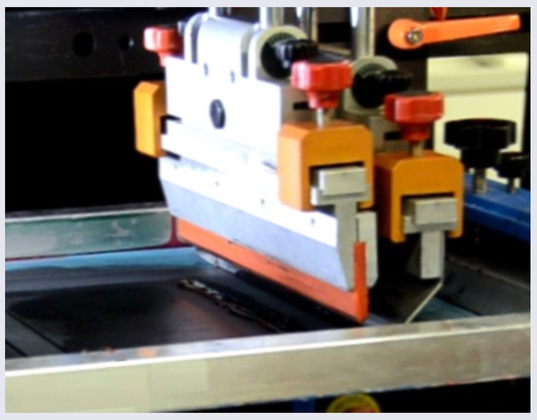
Umwelt-Campus Birkenfeld | HOCHSCHULE TRIER

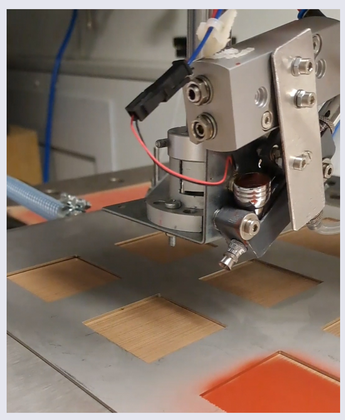
Kompetenzzentrum Brennstoffzelle

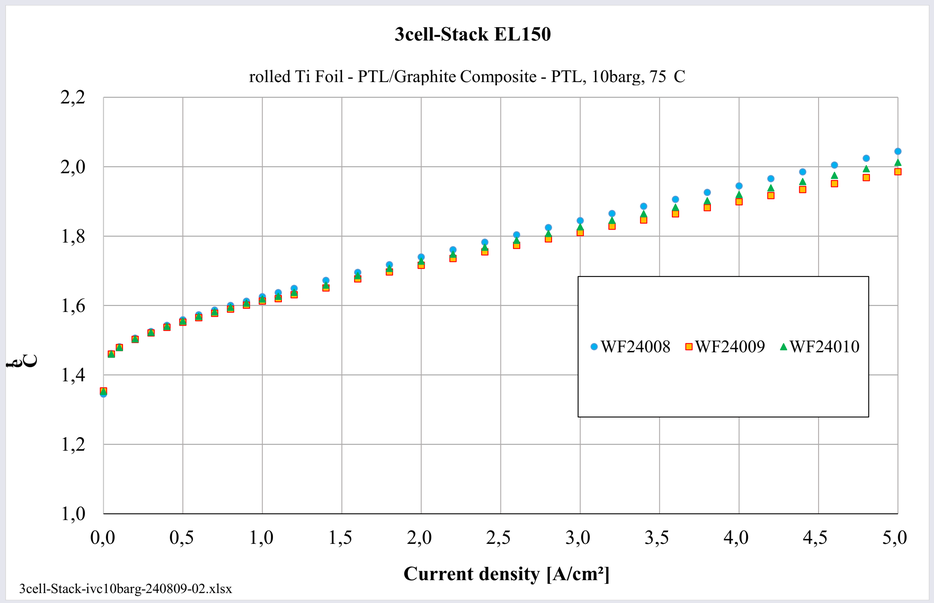
High performance materials for green hydrogen

MEMBRANE ELECTROLYSERS
MADE IN RHINELAND-PALATINATE

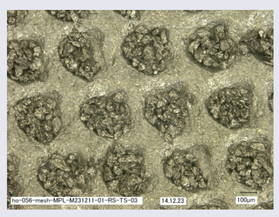
Manufacturing of Low Loading CCM

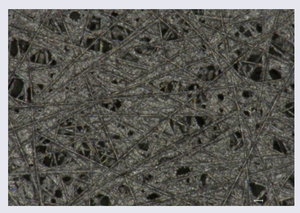


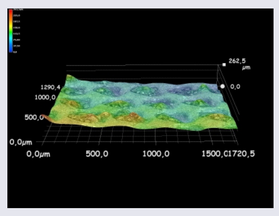


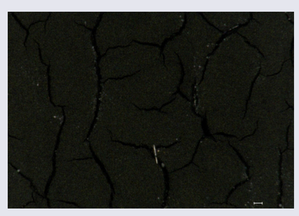


Low-Cost Titanium and Carbon based Porous Transport Layers







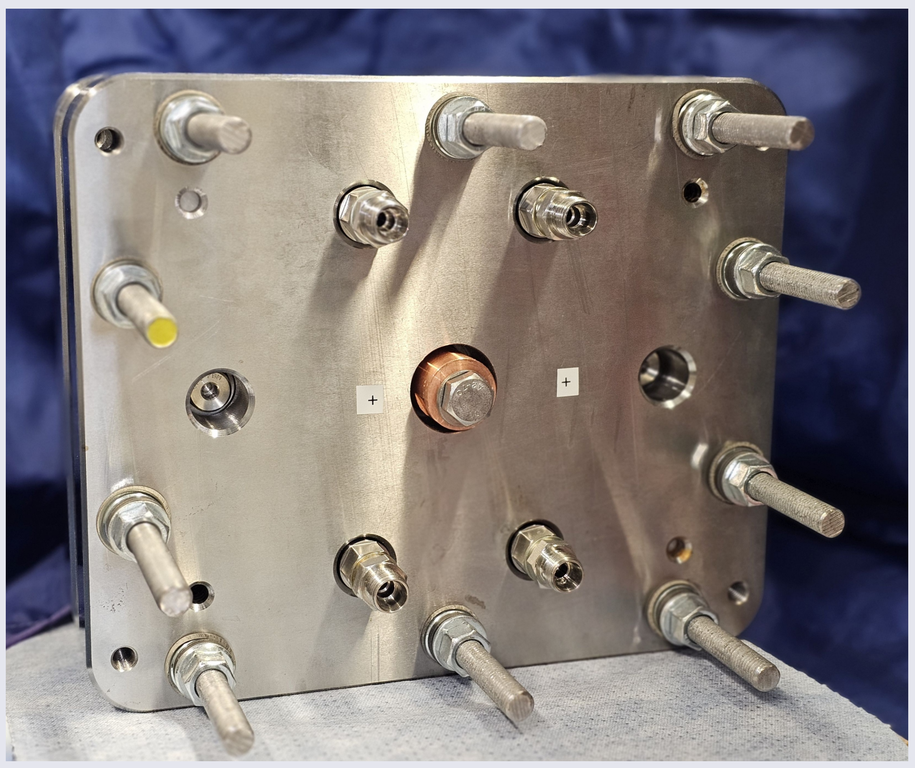


CCM manufacturing (top left):
spray coating and printing with optimized ionomer contact
for high catalyst activity at low loading

PTL - Porous transport layers (top):
manufacturing of developmental low-cost PTL (titanium)
implementation of commercial low-cost carbon fibre papers

In-situ testing/electrolyser hardware (left):
in small lab cells and short-stack prototypes
target size 700cm2 active area under development
excellent performance at Ir loadings 0.5-0.7mg/cm2

Electrolyser Prototype as Development Platform



Technical Specification / Benefits

efficient and compact:
100kWel target (2024) - scalable
700cm2 active area
design for low ohmic resistance
> 70% stack efficiency

sustainable:
< 0.1g Ir/kW, < 0.05g Pt/kW, low titanium content
low cost flow field and PTL materials
carbon composite cathode for cost reduction
high-performance porous transport layers (PTL)
carbon materials where possible
low cost functionalized titanium grid

regional sourcing - primarily European suppliers:
membrane (D)
catalyst (D)
catalyst coated membrane (Rhineland-Palatinate, D)
PTLs (D and B)
carbon flow field (Rhineland-Palatinate, D)

Project Partners

Schaeffler Friction Products

H2-CHEM GmbH

Financial Support

RheinlandPfalz
MINISTERIUM FÜR WIRTSCHAFT, VERKEHR, LANDWIRTSCHAFT UND WEINBAU
INNOPEM

RheinlandPfalz
MINISTERIUM FÜR WISSENSCHAFT UND GESUNDHEIT
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