Facts and Figures

Full name:	**Mass Manufacture of MEAs Using High Speed Deposition Processes**
Acronym:	**MAMA-MEA**
Start date:	**1 January 2018**
Duration:	**36 months**
Total budget:	**3.1 M€**
EC funding:	**3.1 M€**

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Consortium

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SYSTEM S
Nedstack PEM FUEL CELLS

MAMA-MEA

Mass Manufacture of MEAs Using High Speed Deposition Processes

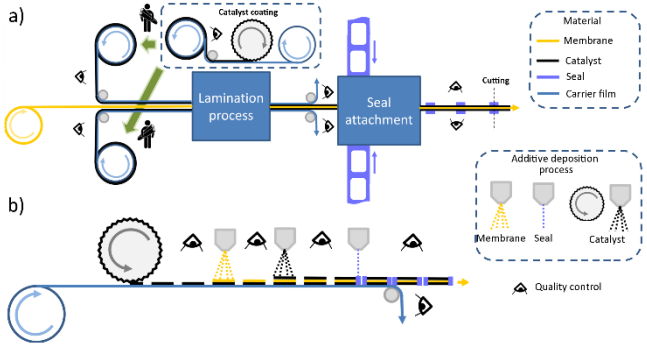
www.mama-mea.eu

grant agreement No 779591

Project Highlights

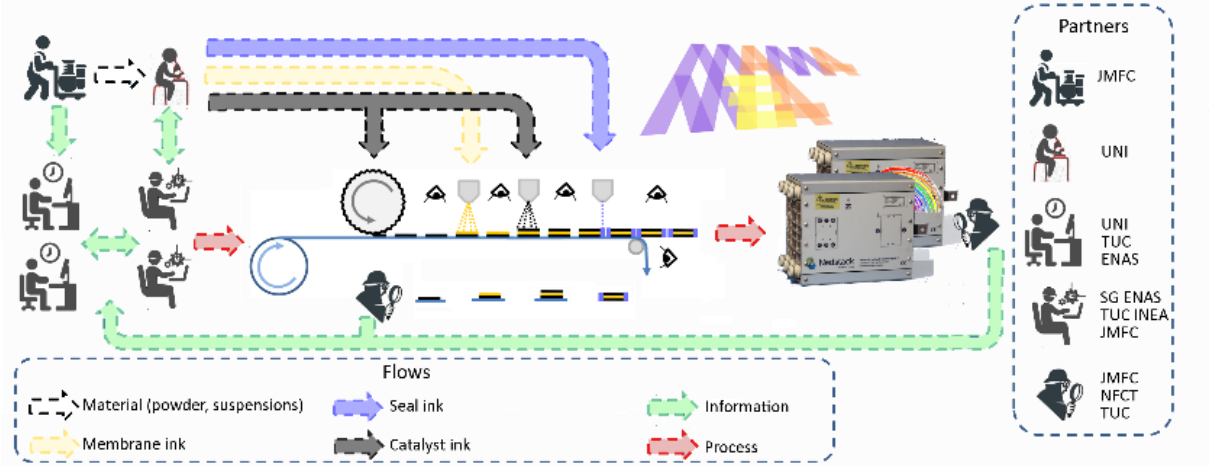
- Developing a novel continuous process for PEM fuel cell sealed CCM manufacture based on sequential deposition of key component layers – an “additive layer” CCM deposition process.
- Identification, assessment and integration of mature deposition techniques (already) employed in thin-film layered devices outside the fuel cells industry.
- Establishing the capability of the process for a step-change increase in manufacturing output by greater than 10 times compared to state-of-the-art continuous manufacturing.
- Validation of sealed CCMs in a stationary application fuel cell stack.
- Increased competitiveness of European fuel cell industry as a consequence of the project results.

Concept and Approach

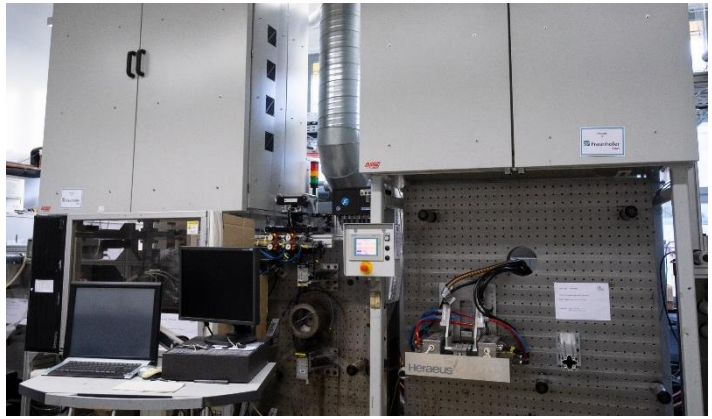


Simplified process flow:
a) State of the art sealed CCM with separate catalyst layer coating, lamination and seal addition processes,
b) Additive layer continuous sealed CCM manufacturing process.

Consortium Capabilities



Main tasks of each consortium partner in the MAMA-MEA project.



Modular roll-to-roll laboratory system for additive material deposition techniques at TUC.

Modular roll-to-roll deposition production line microFLEX at Fraunhofer ENAS for industrial applications.

Project Outputs

- Identification, evaluation and down-selection of at least two mature deposition methodologies from other industries, for detailed process development, based on CCM component layer specifications and requirements.
- Development of an integrated additive layer deposited CCM capable of equivalent or superior fuel cell performance, meeting at least a power density 0.67 W/cm^2 and a degradation rate of <0.25 %/1000 h.
- Development of a comprehensive engineering design of a CCM manufacturing line incorporating the new deposition processes, with line speeds of at least 50 lm/min. This would actually provide a capacity for the CCM in the order of 10 GW/year, which although significantly in excess of the Topic target of over 50 MW/year, is entirely commensurate with the market prospects for the technology in the timeframe of 2025 and beyond.
- Validate the manufacturing capability of the new process by demonstrating state-of-the-art performance of CCMs in two PEMFC stack tests.