



FIT-4-AMANDA

Future European Fuel Cell Technology: Fit for Automatic Manufacturing and Assembly

EUROPEAN COMMISSION

Horizon 2020 | FCH-01-1-2016 | Manufacturing technologies for PEMFC stack components and stacks

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Publishable executive Summary

In the scope of the project Fit-4-AMandA¹, a mass-manufacturing machine (MMM) for polymer-electrolyte membrane fuel-cell (PEMFC) stacks was developed and built. The MMM can increase the production volumes of the PEMFC stacks and in so reduce their price through economy of scale.²

One of the essential prerequisites for being able to manufacture any product in high quantities and high quality is good quality assurance in the process, adapted to the respective cycle times and quantities. Of course, this also applies to MMM. Here, a wide variety of measurement tasks occur to ensure the identification of defects during the production of the fuel cell stack or the stacking process.

In this report, a set of quality-assurance protocols using inline quality control (QC) for with a non-destructive testing (NDT) suitable for PEMFC stack's repeating parts such as bipolar plates (BPPs), membrane-electrode-assemblies (MEAs) and catalyst coated membranes (CCMs) is proposed. Moreover, the protocol for the QC of the sealing is included, too.

Therefore, concrete test procedures and protocols have been identified, investigated and assessed with regard to the suitability for their specific task. Finally, the methodologies, test equipment, evaluated test protocols and their potentials are described in detail.

Together with the confidential report D5.4, this report D5.3 gives a comprehensive overview of the state-of-the-art of the quality-assurance methods used in PEMFC stack sector.

¹ Future European Fuel Cell Technology: Fit for Automatic Manufacturing and Assembly – Fit-4-AMandA (EU project, duration 01 Mar 2017 – 31 Dec 2020, 45 months). Funding Programme H2020-JTI-FCH-2016-1, Grant Agreement #735606.

² Porstmann, S., et al.: Overcoming the challenges for a mass manufacturing machine for the assembly of PEMFC stacks. Machines 7: 1–20, 2019. <https://doi.org/10.3390/machines7040066>.

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Project partners:

| # | Partner | Partner Full Name |
|---|------------|---|
| 1 | UNR | Uniresearch BV |
| 2 | PM | Proton Motor Fuel Cell GmbH |
| 3 | IRD | IRD Fuel Cells A/S |
| 4 | Aumann | Aumann Limbach-Oberfrohna GmbH |
| 5 | Fraunhofer | Fraunhofer Gesellschaft zur Foerderung der angewandten Forschung E.V. |
| 6 | TUC | Technische Universitaet Chemnitz |
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