



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

GA # 735606

Deliverable No.	Fit-4-AMandA D4.6	
Deliverable Title	Evaluation of the machine concept and rating concerning the economic efficiency	
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Publishable Executive Summary

The production of fuel cells and stacks is currently on the way from manual laboratory production to industrial small batch production and later on mass production. For this purpose automatic production technologies and the associated system technology has to be developed and tested.

This phase is economically very critical for the companies, since high production costs and thus high prices make the sales more difficult and at the same time investments in new production technology have to be made. As a result, customers need scalable growing plant technology that allows tiered investments with reusability of the technology in the subsequent expansion stages.

As part of the project, the production technologies for two different stack concepts were developed. For the automatic assembly of the fuel cell stacks the functional units for the realization of the individual technology steps were developed as well as a scalable machine concept, with which start-up systems for the entry into the automatic stack assembly as well as complex plant systems for the mass production can be projected, built and operated.

The fuel cell stack design was adapted - parallel with development of assembly technology and equipment system - according to the process requirements of automated manufacturing, assembly, transportation, handling, image processing and testing.

The design of the assembly line with its stations, handlings and functional units is finalized. The experimental machine system is assembled, installed and putted into operation. The both technologies - with seal on MEA assembled of GDLs and CCM in the machine and with subgasket MEA supplied via stack box - have been realized, tested and qualified.

Acknowledgement

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Project partners:

#	Partner	Partner Full Name
1	UNR	Uniresearch BV
2	PM	Proton Motor Fuel Cell GmbH
3	EWII	EWII 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
7	UPS	UPS Europe SA



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Figures

- Figure 1: Scalability from start up to complex assembling system.....**Error! Bookmark not defined.**
- Figure 2: Cost reduction by more than 50% with automatic stack assembly.....**Error! Bookmark not defined.**
- Figure 3: MMM as is is built up.....**Error! Bookmark not defined.**
- Figure 4: Further possible expansion stages of the MM**Error! Bookmark not defined.**

1. Appendix A – Quality Assurance

The following questions should be answered by all reviewers (WP Leader, peer reviewer 1, peer reviewer 2 and the technical coordinator) as part of the Quality Assurance Procedure. Questions answered with NO should be motivated. The author will then make an updated version of the Deliverable. When all reviewers have answered all questions with YES, only then the Deliverable can be submitted to the FCH JU.

NOTE: For public documents this Quality Assurance part will be removed before publication.

Question	WP Leader	Technical Coordinator	Project Coordinator
	Aumann - Dr.Richter	PM	UNR
1. Do you accept this deliverable as it is?	Yes	Yes	Yes
2. Is the deliverable completely ready (or are any changes required)?	Yes	Yes	Yes
3. Does this deliverable correspond to the DoW?	Yes	Yes	Yes
4. Is the Deliverable in line with the Fit-4-AManda objectives?	Yes	Yes	Yes
a. WP Objectives?	Yes	Yes	Yes
b. Task Objectives?	Yes	Yes	Yes
5. Is the technical quality sufficient?	Yes	Yes	Yes