



FIT-4-AMANDA

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1 Publishable Executive Summary

The goal of this report is to provide a list of methods suitable for the fast in-line tests of fuel cell components and subassemblies. This work addresses technical barriers from the Manufacturing R&D section 3.5 of the Fuel Cell Technologies Office Multi-Year Research, Development, and Demonstration Plan¹, in particular the barriers E. (Lack of Improved Methods of Final Inspection of MEAs) and H. (Low Levels of Quality Control).

Combining data from literature with the experience of the industrial partners (USK, PM, and EWII) and of the relevant hardware and software providers resulted in a decision that the following tests will be focused on:

- integrity and tightness tests of every BPP (100-% testing),
- quality tests of CCM's catalyst layer
- quality tests of MEA for defects typically occurring after hot-pressing (defects in the catalyst layer, pinholes in the membrane, GDL's fibres protruding into the membrane short-circuiting the MEA),
- in-process and post-process quality control of sealings in the stack.

In order to be considered, a non-destructive quality-control method must provide the satisfactory detectability without introducing a new bottleneck into the production. Therefore, the down-selection of methods was optimised to minimise the measuring time allowing a stacking process to reach its maximum throughput. Moreover, methods requiring a post-measurement cleaning or potentially hazardous methods such as X-ray radiography were excluded.

¹ U.S. Department of Energy, Fuel Cell Technologies Office Multi-year Research, Development, and Demonstration Plan, 2015. Accessed 26 March 2018. http://energy.gov/sites/prod/files/2015/06/f22/fcto_myRDD_manufacturing.pdf