About VOLUMETRIQ

VOLUMETRIQ is a Fuel Cells and Hydrogen Undertaking funded under the call FCH-01.2-2014 on "**Cell and stack components, stack and system manufacturing technologies and quality assurance**". It will demonstrate validated volume capable manufacturing processes and quality control systems for both automotive fuel cell stack platform and for major constituent cell components. Stack components will be manufactured, involving improvement of existing methods and enhancement through automated manufacturing processes and tests to achieve robust volume yield and cost delivery. **VOLUMETRIQ** will also demonstrate operational OEM stack performance requirements for ElringKlinger's automotive PEM fuel cell platform, with production readiness.

The project will validate a **complete "at scale" stack production package** which will be overseen by the automotive OEMs, BMW and Daimler.

Consortium

The project partnership involves three industrial partners, **Johnson Matthey Fuel Cells** (UK), **Solvay Speciality Polymers** (IT), **ElringKlinger** (DE), the automotive OEM, **BMW Group** (DE), the SME **Pretexo** (FR) and is coordinated by **CNRS Montpellier** (FR). **Daimler** (DE) is involved as an associate partner.

For more information: *http://www.volumetriq.eu*

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VOLUMETRIQ

VOLUme **M**anufacturing of P**E**MFC stacks for **TR**ansportation and **I**n-line **Q**uality assurance

H2020, FCH 2 JU funded project

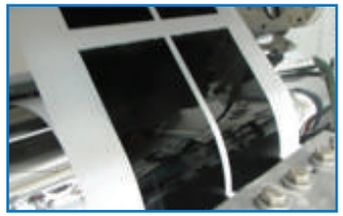
Project Objectives

The principal aim of **VOLUMETRIQ**, a commercialisation focused project, is to develop an EU-centric supply base for automotive PEM fuel cell stacks and their key components with volume manufacturing capability and embedded quality control at its heart.

The stack and components are based on automotive PEM fuel cell technology which is presently TRL5 for component manufacturing approach and concepts. The project will deliver a TRL7 stack and component design, at TRL7 manufacturing maturity, a stack power of 90 kW, and demonstrated cost reduction, via an EU supply base that is consistent with the JU 2020 system targets for performance and cost.

In order to achieve this, the key objectives are to:

- develop the complementary volume manufacturing capability and in-process quality controls at component and sub-component level to **reduce scrap rate to target of <5%**.
- optimise existing component detail designs to **achieve automotive power density of 2,5 A/cm^2 at 0,6 V**



- **advance stack manufacturing technology level to TRL7**
- demonstrate capability to achieve **5000 hours** on representative automotive drive cycle
- demonstrate stack **cost reduction** model consistent with automotive target of 100 €/kW at 2020 assuming 50,000 units per annum

Technical Approaches

VOLUMETRIQ builds upon the **innovative membrane reinforcement and ionomers** from the FCH JU MAESTRO project demonstrated in small stacks at TRL5 with partners Solvay, CNRS Montpellier and Johnson Matthey Fuel Cells.

The **catalyst coated membrane** components (CCM) will be scaled-up as a complete roll-good CCM, consistent with high volume and minimum cost production methods. There will be validated at scale using existing manufacturing methodology to demonstrate output, cost, yield and tolerance capability.

Manufacture of pre-coated **bipolar stamped plates** at ElringKlinger has been validated at manufacturing TRL5 using a dispersed supply chain on a batch production basis. Plate production will be improved and scaled by ElringKlinger, moving to coil fed materials using volume, industry proven, progression press-forming technology. At **stack** level, ElringKlinger's PEM fuel cell technology has already been demonstrated in the field, in operational vehicles.