

Adapting the stacks for automated manufacturing and stacking

In order to adapt Proton Motor’s (PM’s) fuel cell stack (FCS) for automated manufacturing/stacking with a mass manufacturing machine several changes to the basic stack components were necessary. Within the scope of the project these changes are targeted not only to ensure machine handling but also to improve the overall performance of the PM Fuel cells by using state-of-the-art (SoA) components and technologies. [–read more–](#)

The major functional components of the PM FCS are bipolar plates (BPP), gas diffusion layers (GDL) with sealing concepts and catalyst coated membranes (CCM) / membrane electrode assemblies (MEA). All of those crucial FCS elements as well as the overall restraining concept have been investigated for possible optimisations in terms of design-to-manufacture, design-to-cost and enhancing the stack performance. The described optimisations in detail are as follows:

- For enabling an easier automated handling the general BPP footprint was revised, and additional alignment features were implemented. (see fig.1)

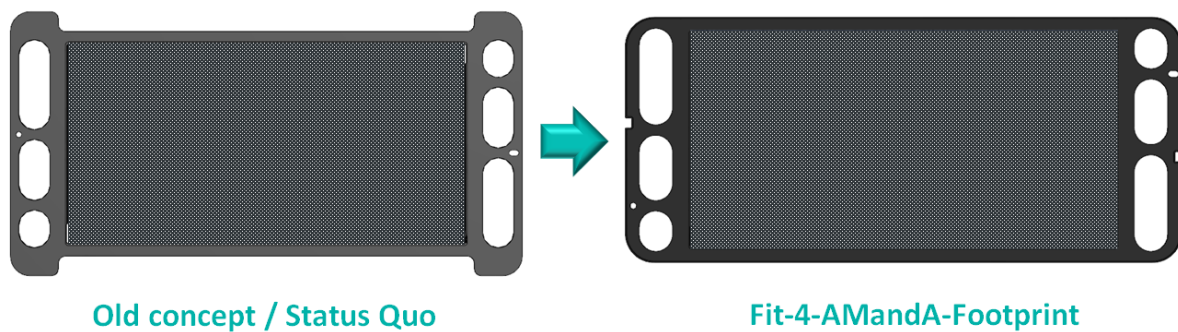


Figure 1: Redesign of the BPP for automated machine handling

- Optimisations of the flow field structures inside the BPP for an improvement of the FCS performance has been carried out leading to reduced pressure loss and enhanced electrical conductivity while showing an equal or slightly better thermal behaviour.
- The GDL concept was revised for better automated handling (see fig.2)

