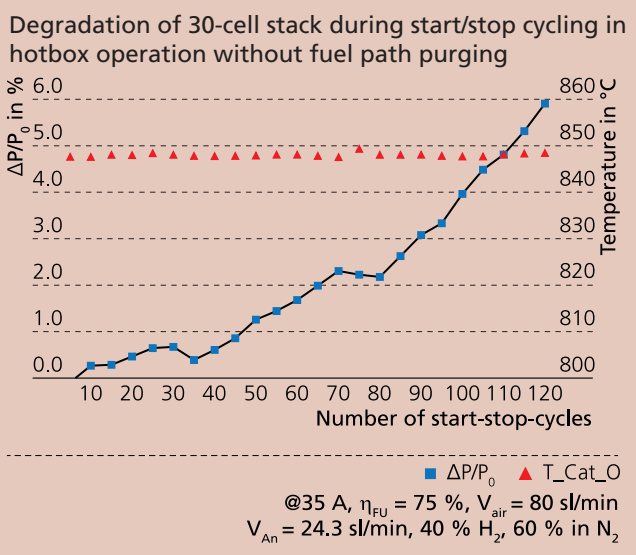


CFY-STACKS – PROGRESS THROUGH DESIGN DEVELOPMENT

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The development of CFY-stacks is a long-standing focus of R&D activities at Fraunhofer IKTS. With stack design MK351, a good platform for enabling proliferation of SOFCs in a wide range of applications was created. Stacks with high efficiencies and low degradation rates (0.7 %/1000 h over > 20.000 h) perform as reliable components in a variety of SOFC systems developed in internal and external projects. In close collaboration with Plansee SE, Fraunhofer IKTS was able to improve the MK351 stack design. The new MK352 stacks are more robust, can be easily integrated into SOFC systems, and feature a lower pressure drop along the air path. Moreover, this stack type affords a reduction in production costs and an enhancement in yield, both of which are very important for commercialization of the CFY-stack technology. The new stack is based on a symmetrical interconnect design enabling compensation for tolerances resulting from net-shape pressing technology and simpler stack integration into larger modules. By modifying the tolerance chain for all of the stack components, it was possible to improve manufacturing system and performance robustness. In hotbox tests with a 30-cell stack, a new benchmark for start/stop cyclability was set. The stack showed a power degradation of 0.5 %/10 cycles over more than 120 cycles (Figure 1).

Layout changes in the air channels of the interconnect flow field led to a pressure drop that was more than 50 % lower than that of the actual MK351 design. Thus, the total SOFC system efficiency can be enhanced due to the lower energy consumption of the air blower insofar as less power is needed to supply the air to the stacks.



After completion of successful validation of MK352 design in standard testing of performance, long-term stability and start/stop cyclability, the new robust, efficient and cost-efficient stack platform will be available for various SOFC systems.

Services offered

- Test of stack components for SOFC/SOEC under real operating conditions
- Development of stack modules for utilization in SOFC systems
- Purchase of SOFC/SOEC stacks and modules

- 1 Interconnect of MK351 (back) and MK352 (front).
- 2 MK352 30-cell stack ready for delivery.