

MOD-FC

Modular fuel cell stack

Invention

A modern fuel cell is usually made of a stack of individual cells that are mechanically pressed together. In MOD-FC the pressing takes place not mechanically but hydraulically.

Due to the complete flushing of separate individual cells with the hydraulic medium, a homogeneous pressing of the inner cell components is ensured. In addition, the hydraulic medium can be directly used as a cooling medium. This ensures a homogeneous electric current generation among the surface and also that no life shortening hot spots appear. By the nearly ideal operating conditions MOD-FC are capable to examine in-situ membrane electrode units. First functional models are already in use (see figure). A plurality of simultaneously reproducible samples can be examined under the same operating conditions, which improve the quality of test results and reduces significantly the amount of sampling tests. Moreover, individual elements can be

replaced by separate individual cells without great effort, due to the modular design of the stacks. In contrast to conventional fuel cell stacks MOD-FC can thus be maintained at a cellular basis.

Commercial Opportunities

MOD-FC can be used in all areas of application. Their strengths are remarkable especially in applications which require a long lifetime. By the exchangeability of single cells for example, powerful cellular components can be retrofitted during maintenance activities (Retrofit). It could also be shown that MOD-FC allows an Up-Scaling, avoiding the usual losses. Thus MOD-FC are flexibly configurable for all power levels. In addition, water electrolyzers have already been set up, based on the stack concept with hydraulic pressing.

Current Status

MOD-FC is patented in Europe and the USA, more patent applications are pending.

On behalf of the Westfaelische Hochschule and the ProH+ GmbH, PROvendis offers interested companies the opportunity to licensing and continuing the development of the presented technology.

An invention of the Westfaelische Hochschule and the ProH GmbH.

Competitive Advantages

- Uniform pressure distribution on each individual cell
- Uniform cooling
- Homogeneous temperature & current density distribution
- Longer lifetime
- Easy replacement of individual cells
- The use on electrolysis has been tested

Industries

- Chemistry

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