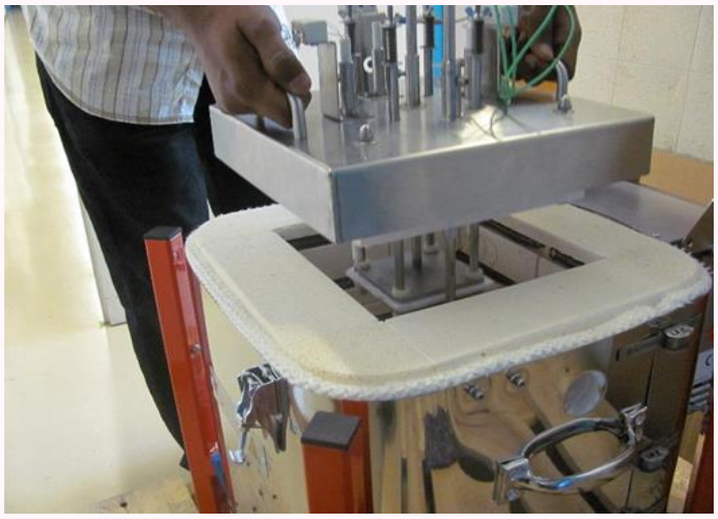
Fiaxell
SOFC Technologies™

Components for
Solid Oxide Fuel Cell development

Open Flanges Set-up™

One single set-up for all cell tests



End of broken cells and secure testing: the cell is squeezed by a soft alumina felt that prevents any damages, the excess fuel burns continuously in the alumina felt at the cell edges

Technical training: the set-up comes with a video manual with detailed instructions. A two days training is also offered in our lab.

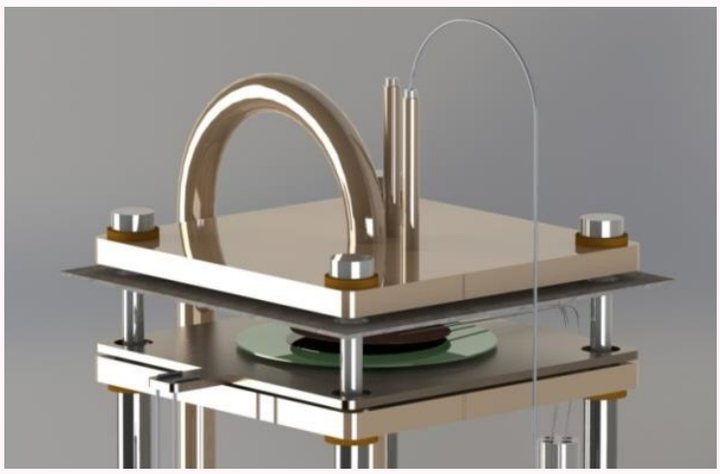
Sealed option & exhaust gas recovery: the cell (anode and/or cathode chamber) is sealed with plastic mica, gold ring or glass. Exhaust gas are recovered through pipes for GC analysis

Located in the Science Park of EPFL in Lausanne, Fiaxell is looking forward to your visit for a test demonstration

Flexible cell dimensions: cells of Ø 8 to Ø 80 mm (or square till 70x70 mm) can be successively installed

Quick start of experiment: less than 20 minutes to remount a new cell with different dimension, thanks to the simple design without sealing

Other SOFC components: the open flanges test rig is also useful for conductivity measurements (electrolyte, electrode material, interconnect etc.) and sealing tests



Open Flanges head with fuel diffuser and double thermocouple holder for optimal cell temperature control

Constant pressure load: 4 external springs ensure a constant and controlled pressure on the cell during the whole test. Pressure from 0 to 100 Kg can be imposed on the cell

Heating: the Set-Up comes with a robust Kittec German furnace that can be used for the sintering of all SOFC components (electrodes, cell, powders etc.) till 1320°C

Corrosion resistant & robust: flanges and tubes (air and fuel) made in Inconel 600 & 601. The set-up is built up to last for years

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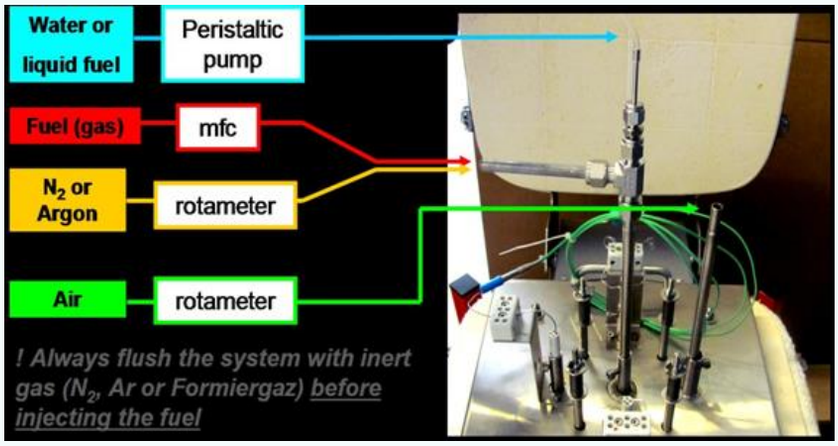
Integrated steamer for electrolysis and gas processing



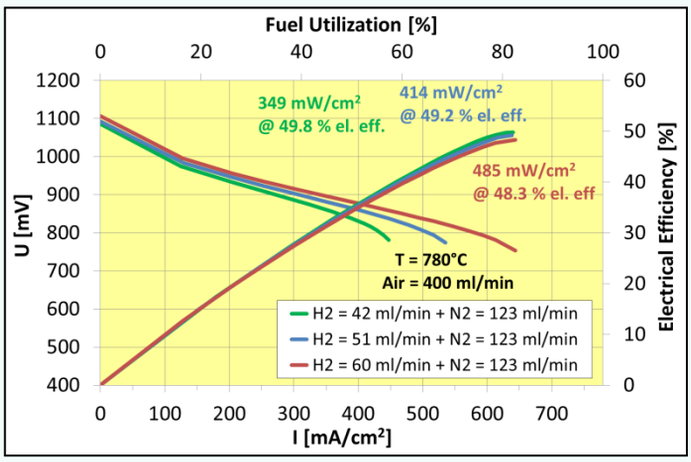
Thanks to the ceramic cartridge in the steamer, **a very constant steam flux** flows on the cell, which is necessary for electrolysis tests (ask for our video demonstration).

Liquid fuel mixed with water can also be injected with the steamer.

The easy interchangeable ceramic cartridge can also be impregnated with catalyst of choice and **in-situ gas processing**, as **steam reforming** (see www.fiaxell.com) or **partial oxidation** will take place before to reach the SOFC cell.

Fuel utilisation and electrical efficency

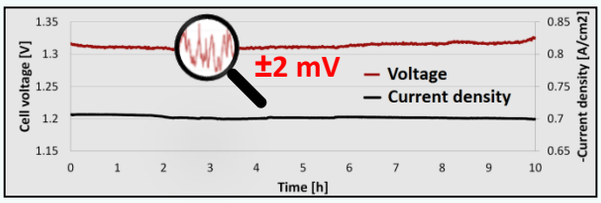
Different fuel flow rates are injected for electrical efficiency study. Without any sealing, **till 85 % of fuel utilisation** and **electrical efficiency close to 50 %** have been achieved.

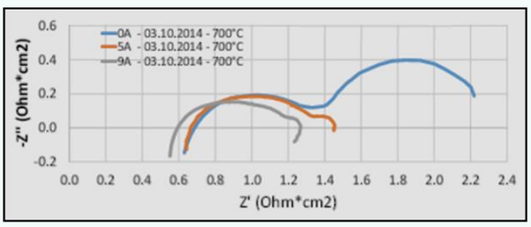


Test conditions: Open Flanges™ Set-Up with a 2R-Cell (cathode SA: 10.2 cm^2)

Stability of steam injection

The integrated steamer provides a *constant steam flux* producing **low voltage fluctuations during electrolysis** allowing the **use of impedance spectrometer** for an in-depth study of the cell.





Electrolysis test done at EPFL (JVH group, Swiss Institute of Technology, Lausanne) with the integrated steamer, and impedance spectroscopy on the cell during **electrolysis mode**.

Some of our customers and references:

Prof. H. Middleton, University of Agder-UIA (Norway); CSIR-Central Glass & Ceramic Research Institute, Kolkata (India); University of KwaZulu Natal (South Africa); *Prof. G. Taillades*, University of Montpellier (France), *Prof. O. Joubert*, IMN Nantes (France); *Prof. G. Caboche*, ICB Dijon (France). *Dr. J. Dally*, Eifer (Germany), *Prof. Anthony Chesnaud*, Paristech (FR), *Prof. Laurent Dessemond*, LEPMI, Grenoble (FR), *Dr. Per Martin Rørvik*, Sintef, (Norway), *Prof. Tulio Matencio*, University Minas Gerais (Brazil), *Prof. N. Faisal*, Robert Gordon University (UK), *Prof. Nicoleta Cioatera*, UCV Craiova (Romania), *Dr. Karim Ansari*, University of Sheffield (UK), *MER Jan Van herle*, EPFL lausanne (CH), *Dr. Fabio C. Fonseca*, IPEN, Sao Paulo (Brazil) *MER P. Briois*, UTBM, Belfort (FR), *MER D. Fasquelle*, Uni. Du Littoral, Calais (FR), *Prof S. Basu*, IIT New Delhi (India), *Dr. A. Yaremchenko*, Universidade de Aveiro (PT), *Dr. R. Campana*, CNH2, Puertollano (Spain), *Prof. M. Cassir*, Paristech (FR), *Dr. P.V. Aravind*, TU Delft (NL), *Dr. Johannes Gulden*, Fachhochschule, Stralsund (Germany)

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