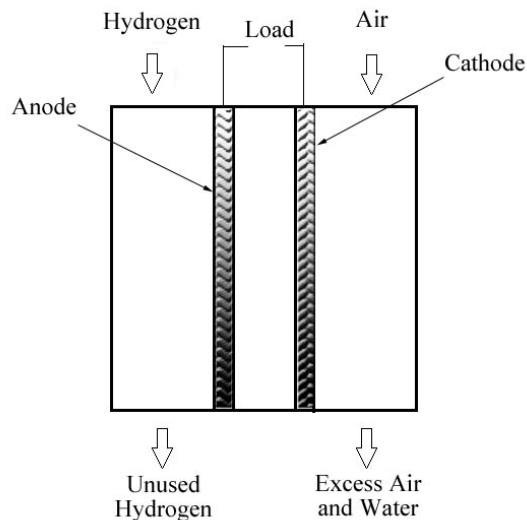


ElectroChem's Unique Flow Field (IFF) Design for PEM Fuel Cell

ElectroChem's IFF design provides the solution for water management within a PEM Fuel Cell

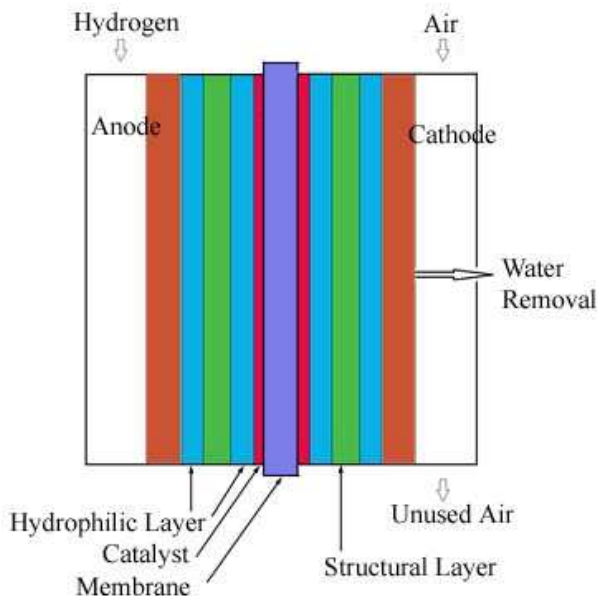
Traditional Fuel Cell



Traditional Fuel Cell Water Management Issues

- Formation of water slugs, and drops in gas channels
- Uneven gas distribution
- Uneven current distribution in flow-field
- Lack of consistency in performance
- Unused hydrogen and air/oxygen must be removed
- Water must be removed to prevent flooding
- Water management a key design consideration
- Size and weight are considerations
- Balance of plant size is a factor

IFF Fuel Cell



The IFF Solution

- Stable performance in both high and low airflow rate
- Minimize mass transfer limitation
- Maximize gas distribution and water and vapor removal
- Internal humidification-stable in low humidity
- No flow-through Hydrogen
- Dead-ended operation in H₂/O₂
- Effective removal of water
- Reduced humidifier capacity
- Lower pressure gas injection
- Internal water removal
- Lower balance of plant costs
- Balance of Plant simplification
- Lower size and weight



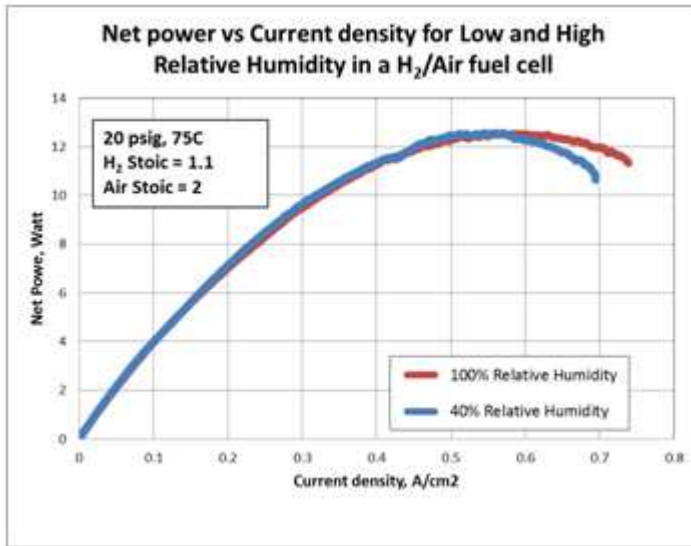
ElectroChem, Inc.

Over 40 years of experience invested in fuel cell technology.

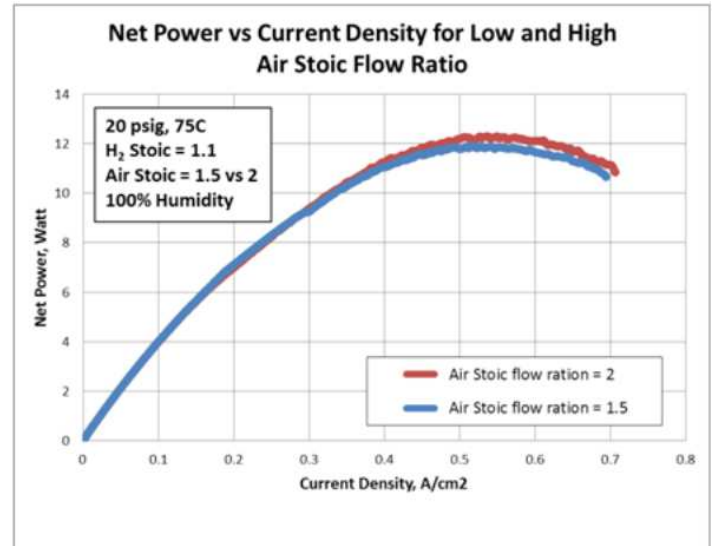
Over 20 years in product manufacturing and sales.

Owner of many patents which serve as a testament to ElectroChem's innovative capabilities.

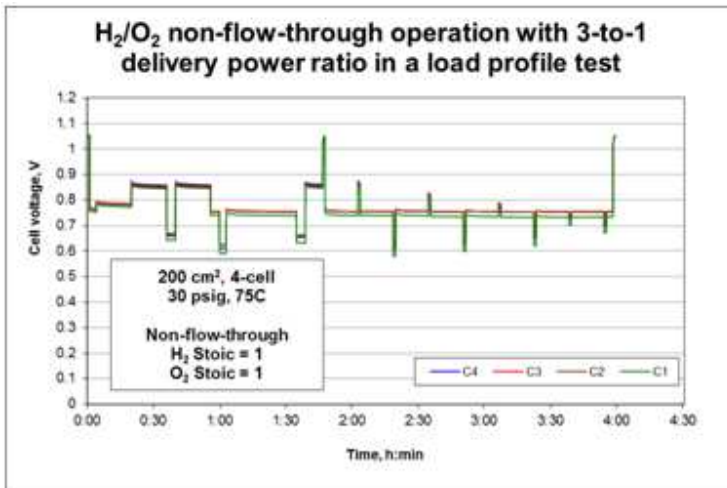
ElectroChem's IFF Fuel Cell's Performance Tests



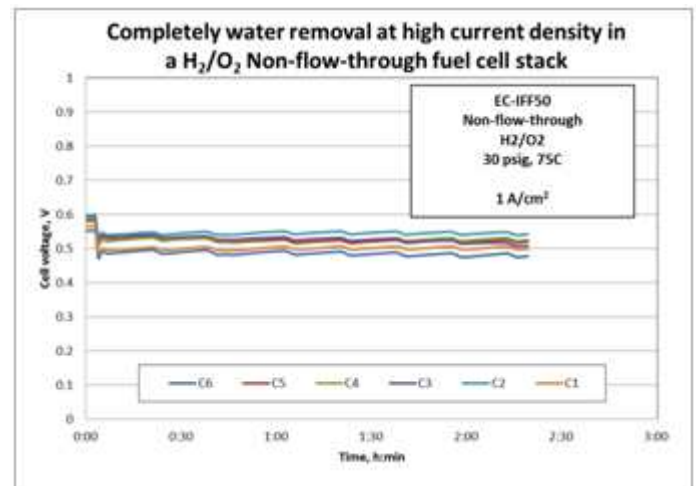
Effective Internal humidification capability maintains the same power output at low humidity conditions



Effective reactant gas distribution flow field design maintains the power output at low air flow rate



Effective passive water removal capability enabling the operation of fuel cell stack at non-flow-through (at stoichiometry= 1). 4-hour load profile test in a 200cm², four cell stack



Highly water removal mechanism makes the fuel cell stack operate at high current density (1A/cm²) in a non-flow-through stack (50 cm², six cell stack)

ElectroChem researches, develops, tests and manufactures highly reliable testing equipment, stacks, MEA's, and electrodes. We offer a comprehensive line of standard products - but we also welcome customized requests to meet a customer's needs.

It's global clients include small businesses, fortune 500 companies, universities, and governments and has a network of distributors in Japan, Europe, Mexico, India and Russia.

ElectroChem is a leading supplier of fuel cell components and test equipment to researchers around the globe:

- Stacks with and without MEA
- Testing Equipment
- Components
- Testing supplies

