

Thin Electrolyte-Supported Fuel Cells for SOFC Technology

ENrG Inc. specializes in the development and manufacture of ceramic membrane and coating technologies for clean energy applications such as solid oxide fuel cells (SOFC) and gas separation membranes. ENrG has completed a licensing agreement with Corning Incorporated to produce thin ceramic membranes with excellent thermal cycling performance and high durability for SOFC's. The advanced technology will allow for the commercialization of electrolyte-supported, thin profile fuel cells with robust structure and incredible tolerance to thermal shock, best suited for fuel cell stack designs.

The technology will enable the fabrication of thin and flexible electrolyte-supported sheets with the following expected characteristics:

- Thin, self-supported 3mol Yttria Stabilized Zirconia (3YSZ) sheet 50 μm or less.
- High inherent strength (>1Gpa) and high toughness.
- 1000 MPa average bend strength for 2 cm wide sheet.
- High thermal shock tolerance through flexible stress relief.
- Thermal cycling capability of 2000 hours accumulated operating time.
- Electrolyte samples thermal cycled to >1,000°C in 1-5 seconds then air-cooled, resulting in no fracture.
- Power density – 320 mw / cm^2 @ 725°C
- Total thickness; $\leq 65\mu\text{m}$ with anode, cathode coatings.

ENrG Inc. develops and manufactures ceramic components for a variety of applications; solid oxide fuel cells, gas separation membranes, insulation packages for thermal management in energy systems, ceramic tapes, setters and liners and kiln furniture, and oxygen transport membranes. ENrG's strength is transitioning laboratory concepts into manufacturable products, and the company works with development groups at OEMs that require critical ceramic components for system performance.

Flexing of sintered 20 μm electrolyte sheet

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