About Nexceris

Nexceris, LLC

- Founded in 1994 as NexTech Materials, privately held
- Technology Developer – advanced ceramics, electrochemical devices
- Product Developer – solid oxide fuel cells, sensors and catalysts
- Manufacturer/Distributor – sensors, fuel cells, and related products
- ISO 9001:2015 Certified – covers all products and services

Our Brands

- FCM
- NTM Sensors
- LI-ION TAMER
Nexceris History in SOFC Technology

- **1994**: Company founded, initiated work on SOFC materials development
- **2000**: Established *fuelcell* materials division and began selling products
- **2004**: Initiated development of planar cell designs
- **2006**: Initiated SOFC stack development, focusing on military applications
- **2011**: Focused efforts on SOFC materials for high performance & durability
- **2015**: Established high power density SOFC stack design
- **2018**: ARPA-E project on pressure tolerant, 10-kW scale SOFC stack design
- **2019**: Initiated work on SOEC (hydrogen production) and RSOFC (energy storage)
Planar Cell Design

Potential SOEC Advantages

- Relatively thin membrane for improved electrochemical performance
- Dense cell periphery facilitates sealing
- Mechanically supported membrane can withstand pressure differentials
- Electrodes deposited separately (material/process flexibility)

FlexCell

- U.S. Patent No. 8,192,888
- Two-layer structure with a perforated mesh layer mechanically supporting a thin electrolyte membrane
Potential Advantages for SOEC Systems

- High gravimetric power density reduces materials cost and thermal mass
- Design integrates thermal insulation, containment and stack compression functions
- Electrolyte supported stack platform for ease of sealing and pressurization
- Open-air design simplifies egress of oxygen effluent into ambient
- 10-kW scale (ARPA-E) stack would be ideal module size for large-scale SOEC systems