



# 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

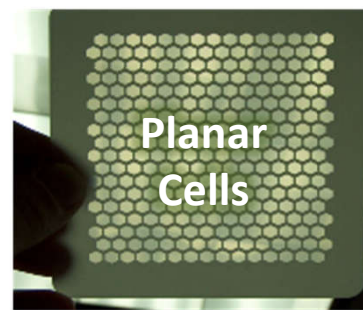
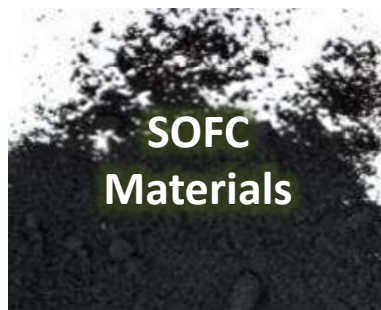




# Nexceris SOFC History

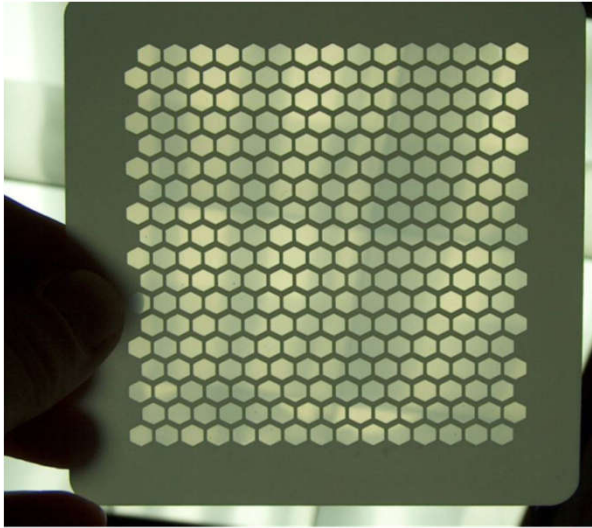
## Nexceris History in SOFC Technology

- **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



## FlexCell

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

## 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)



# *Nexceris SOFC Stack/Hotbox Design*

## 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

