

# IN SITU ELECTROCHEMICAL O<sub>2</sub> SENSOR

For High-Temperature Molten Salts



## TECHNOLOGY SUMMARY

The HiFunda/BYU team is developing an electrochemical sensor for oxygen determination in high-temperature molten salts (HTMS). The technology leverages HiFunda's high-temperature reference electrode (HTRE) platform technology which measures the temperature and open circuit potential of HTMS. Oxygen is measure in situ via square wave voltammetry at a gold sense electrode. The final product will reduce the time, cost, and complexity associated with obtaining high-quality measurements of molten salt properties.

## FUNDING AND OPPORTUNITY

Our SBIR project is currently in Phase I and funded by the DOE. We are at an exciting stage where collaboration with potential end users can significantly enhance our project's scope and impact. We are seeking voice-of-customer inputs, letters of support, and potential end users within the following markets: HTMS, Corrosion Control, Concentrated Solar Power, Materials Processing, and Nuclear Power Generation to join us. This collaboration offers a chance to be involved in pioneering research and influence new O<sub>2</sub> sensor product designs, and future federal investment.

### Company Profile



Founded 2008



Salt Lake City, UT



9 Employees

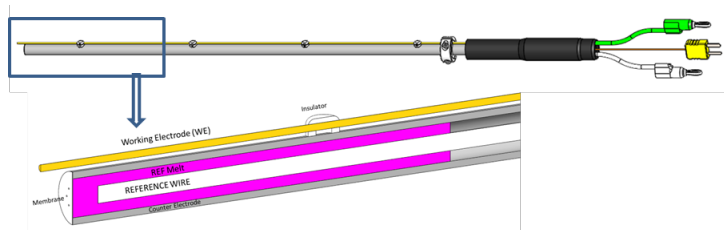
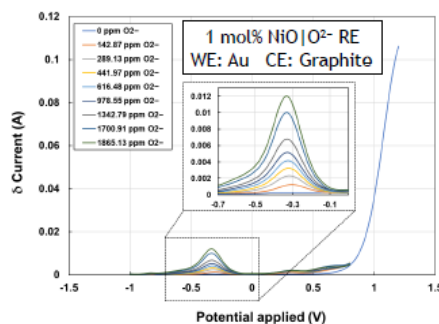


Illustration of the Envisioned HTMS Electrochemical O<sub>2</sub> Sensor Technology



Performed at 36 Hz, step size of 2 mV, and amplitude of 20 mV

SWV for O<sub>2</sub> determination in NaCl-KCL HTMS at 750°C

## CAPABILITIES

- Reduction in time & cost
- Measures temperature and oxygen simultaneously
- Suitable for real-time, in-line measurements
- Lower operational risk

## APPLICATIONS/INDUSTRIES

- High-Temperature Molten Salts
- Corrosion Control
- Concentrated Solar Power
- Metallurgy and Materials Processing
- Nuclear Power Generation

HiFunda, LLC

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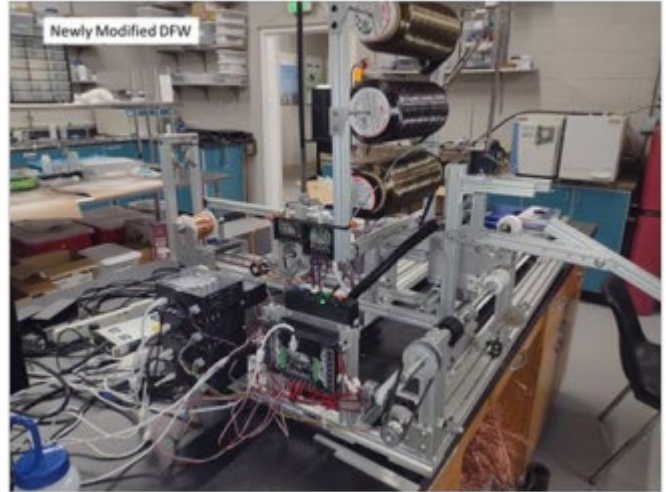
# RADIATION SHIELD FOR HIGH TEMPERATURE LIQUID SODIUM PUMPS



## TECHNOLOGY SUMMARY

HiFunda, LLC is developing technology for custom fiber-reinforced geopolymer-based materials and advanced filament winding and/or additive manufacturing (AM) processes for fabricating improved radiation shields. The technology is designed to enable electromagnetic pumps to operate while submerged at high temperatures and under irradiation during liquid metal reactor operations.

The final product will have a quantitative advantage over the current state of the art by simplifying the pump design, enhancing shield capacity, and improving operational efficiency in liquid metal reactors.



HiFunda's Custom Filament Winding System

## FUNDING AND OPPORTUNITY

Our SBIR project is currently in Phase I and funded by the Department of Energy. Collaboration with potential end users would significantly enhance our project's scope and impact. We are seeking potential end users in nuclear reactor cooling systems, nuclear medicine, space electronics design, or liquid metal pump development to join us. This collaboration offers a chance to be involved in pioneering research and inform future federal investment.

### Company Profile



Founded 2008



Salt Lake City, UT



9 Employees

## CAPABILITIES

- Improved Shielding Capability (Gamma & Neutron Radiation)
- Enhanced Durability
- Reduced Volume & Structure
- Operable in High-Temperature Environments

## APPLICATIONS/INDUSTRIES

- Liquid Metal Pumps
- Neutron and Gamma Imaging Systems
- Nuclear Fusion Reactors
- Space Electronics
- Nuclear Waste Management
- High Temperature Molten Salts

### HiFunda, LLC

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