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NREL ENERGY SYSTEMS
INTEGRATION FACILITY
NATIONAL RENEWABLE ENERGY LABORATORY

U.S. DEPARTMENT OF ENERGY

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Energy Systems Fabrication Laboratory

The Energy Systems Fabrication Laboratory at NREL's Energy Systems Integration Facility (ESIF) manufactures components for fuel cells and electrochemical cells using a variety of manufacturing techniques. Fabricated components include catalysts, thin-film and gas diffusion electrodes, and membrane electrode assemblies (MEAs). The laboratory supports NREL's fuel cell and electrochemical cell related research.

Laboratory Specifications

- Current fabrication of MEAs up to 50cm² electrode area
- Planned fabrication of MEAs up to 400cm² electrode area
- Availability of various coating techniques such as handpainting, knife spreading, and spray coating for catalyst coated membranes (CCM) and gas diffusion electrode (GDE) fabrication
- Individually adjusted ink formulation for each fabrication method and application
- Protocols for reproducible manufacturing and material preparation
- Wet chemical synthesis and fabrication of materials and device components

Application Scenarios

The main focus of the laboratory is to provide support for fuel cell research that is performed in adjacent laboratories. The laboratory enables NREL to manufacture fuel cells in-house using, for example, experimental catalyst developed at NREL. It further enables the creation of MEAs containing artificial defects required for the systematic study of performance and lifetime effects and the evaluation of in-house and externally developed quality control diagnostics for high volume production of fuel cell. Experiments performed in the laboratory focus mainly on the development of alternative fuel cell manufacturing methods.

Partner with Us

Work with NREL experts and take advantage of the state-of-the-art capabilities at the ESIF to make progress on your projects, which may range from fundamental research to applications engineering. Partners at the ESIF's Energy Systems Fabrication Laboratory may include:

- MEA manufacturers
- Fuel cells and electrochemical cells manufacturers
- Certification laboratories
- Universities
- Other National laboratories

Contact Us

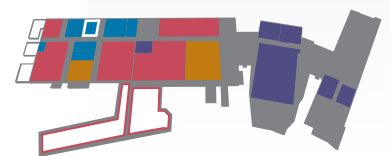
If you are interested in working with NREL's Energy Systems Fabrication Laboratory, please contact:

ESIF Manager

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Major Laboratory Equipment

- Ultrasonic and air brush spray systems
- 12 ton hot press; future planned 50 ton hot press
- High precision balances
- Ball mill
- Vacuum hot plates and gel dryer
- Hot plates
- Ultrasonicator
- Ultrasonic bath
- Stir plates
- Convection oven
- Fume hood



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NREL is a national laboratory of the U.S. Department of Energy
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