SOUTHWEST RESEARCH INSTITUTE

Energy Storage Technology Center®

The Southwest Research Institute® (SwRI®) Energy Storage Technology Center® (ESTC) is the collaborative effort of a broad range of technology experts from diverse scientific fields. The group supports industry and government clients in the research, development, and evaluation of energy storage systems (ESS).

SwRI has the in-depth expertise, broad experience, and extensive facilities and equipment required to address technology challenges in the development of energy storage systems, including:

- Battery systems for electric and hybrid electric vehicles
- Battery systems for grid storage
- Flywheels
- Hydraulic accumulators
- Stationary systems such as flow batteries tied to the electric power grid
- Thermal storage systems
- Ultra capacitors

Services

Services offered include:

- Abuse testing
- Battery management system development and testing
- Chemistry-related services
- Large system development for grid-scale storage
- Listing and labeling
- Manufacturing system development
- Materials development
- Qualification testing
- Test protocol development
- System integration

Test and Evaluation

The ESTC offers a wide range of test and evaluation capabilities and equipment for electrochemical systems (batteries), including:

- High power bi-directional DC power supplies
- Calorimeter chamber
- Fire test facilities capable of complete vehicle tests
- Measurement of toxic emissions
- Short-circuit test equipment for high-energy systems
- Hydraulic press chamber for abuse testing to SAE, ISO, UN, and other standards

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SwRI uses a wide variety of battery evaluation systems to determine performance and reliability under carefully controlled conditions.

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Equipment is exposed to simulated vibration and shock on electrodynamic shakers for evaluation of performance during transport and operation.

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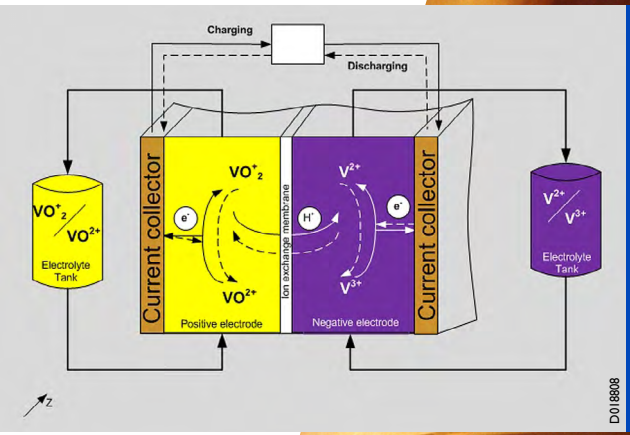
- Pack-level thermal testing
- Temperature-controlled aging
- Thermal imaging systems
- Physical environmental testing
  - Simulated earthquake vibration
  - Ground or air transportation vibration
  - Installation and handling shock
  - Temperature, humidity, wind, and rain
  - High-altitude transportation and operation
  - Airborne contamination
  - Acoustic noise measurement
  - Corrosive atmosphere
  - UV exposure and solar loading



ESTC engineers have conducted research and development of electrolyte formulations, proton exchange membrane technology, mechanical fluid systems, and electronic control systems for a grid-scale vanadium redox flow battery.

Facilities

ESTC facilities are used to evaluate:

- Cells
- Packs
- Grid storage battery systems
- In-vehicle packs
- In-vehicle battery and powertrain
- ESS component-in-the-loop
- Battery with electric motor and power electronics
- Fire exposure (short and long duration)

Additional Capabilities

In addition to development of energy storage devices, the ESTC offers assistance in many types of system integration, including:

- Power grid to storage communication protocols
- Cyber security of communication networks
- Control systems and strategies
- Storage system sizing using modeling and simulation

SwRI conducts fire testing of vehicles and stationary energy storage systems.

We welcome your inquiries. For more information, please contact:

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SOUTHWEST RESEARCH INSTITUTE

Southwest Research Institute is a premier independent, nonprofit research and development organization using multidisciplinary services to provide solutions to some of the world's most challenging scientific and engineering problems. Headquartered in San Antonio, Texas, our client-focused, client-funded organization occupies 1,200 acres, providing more than 2 million square feet of laboratories, test facilities, workshops, and offices for nearly 2,700 employees who perform contract work for government and industry clients.

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