

Carolina Institute for Battery Innovation (CIBI)

Fraunhofer USA's Role in Advancing Next-Generation Battery Technology



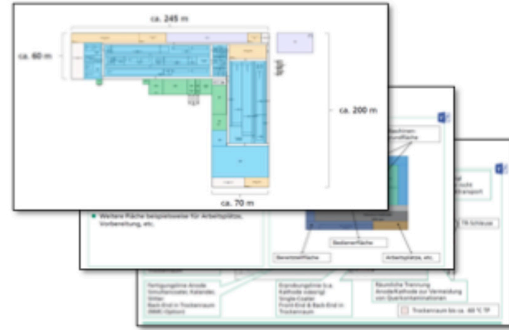
Carolina Institute for Battery Innovation
Molinaroli College of Engineering and Computing
UNIVERSITY OF SOUTH CAROLINA

Carolina Institute for Battery Innovation (CIBI)

- Based at University of South Carolina; CIBI is dedicated to advancing battery technology through research, education, and manufacturing.
- Focuses on innovations at all scales: nanoscale materials, cell-level design, to grid-scale energy storage.
- Research goals include improving energy density, lifespan, safety, and recyclability of battery cells and systems.
- Leads the development of new educational programs for undergraduate, graduate (PhD), and technical college students to train the next-generation battery workforce.
- Emphasis on hands-on learning, combining academic study with practical, manufacturable battery cell production.
- Manufacturing capabilities include pilot-scale production of pouch, and cylindrical battery cells to validate innovations under realistic conditions.
- Strong industrial and academic partnerships to accelerate translation of research into commercial/industrial application.
- Supports the battery industry and economic development across the entire Southeast U.S. region.

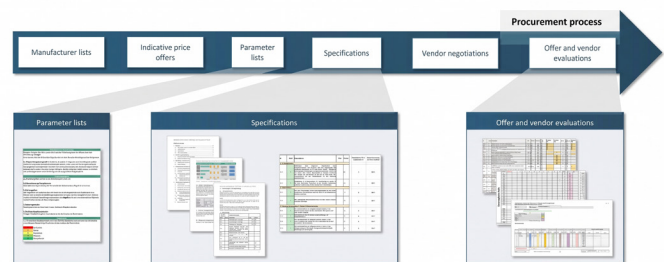
Fraunhofer within CIBI

- Fraunhofer USA is a core project partner in CIBI, contributing German and international expertise.
- Brings proven competences in **cell design** and **cell manufacturing** from lab-scale to pilot-scale.
- Leverages experience from **Fraunhofer FFB**, **Fraunhofer IPT**, and **Fraunhofer USA/CMI** for process design and program execution.
- Provides structured methods for **space planning and material flow**.
- Defines electrode manufacturing processes, evaluates vendor technologies, and provides guidance on process performance and cost optimization.
- Leads development of **new operations and processes**, including:
 - Electrode pre-/post-treatment
 - **Dry coating** technologies
 - Electrolyte filling methods
- Develops and standardizes **formation and testing protocols**.
- Establishes **standardized cell designs** to ensure comparability and scalability across research projects.
- Supports **training and workforce development**, both by building programs in the U.S. and by leveraging existing Fraunhofer infrastructure and training platforms in Germany.
- Acts as a **bridge between U.S. and European innovation ecosystems**, accelerating industrial translation.



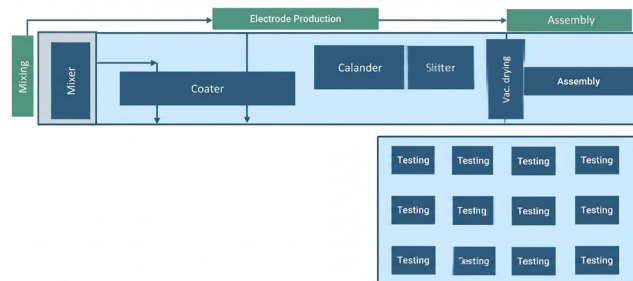
Facility Layout

Proposed facility layout and workspace organization.



Procurement Process

A structured procurement process guiding equipment selection from initial requirements through vendor evaluation.



Production Workflow

Overview of the battery production workflow, from electrode preparation and assembly through final testing.

About Fraunhofer USA

Fraunhofer USA is a 501(c)(3) nonprofit that bridges the gap between academic discovery and industrial innovation. Battery technology is one piece of a broader portfolio that includes advanced manufacturing, sustainable energy, artificial intelligence, software systems, and materials science. We provide industry, universities, and government partners with rapid lab-to-market technology transfer, a more practical, cost-effective alternative to in-house R&D.

Contact

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