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UL 9540A Test Method for Battery Energy Storage Systems (BESS)

The UL 9540A test method is designed to meet stringent fire safety and building code requirements for battery energy storage systems.

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UL 9540A, the Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, is the American and Canadian national standard for

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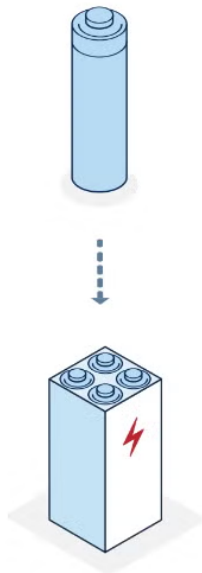
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UL 9540A testing levels

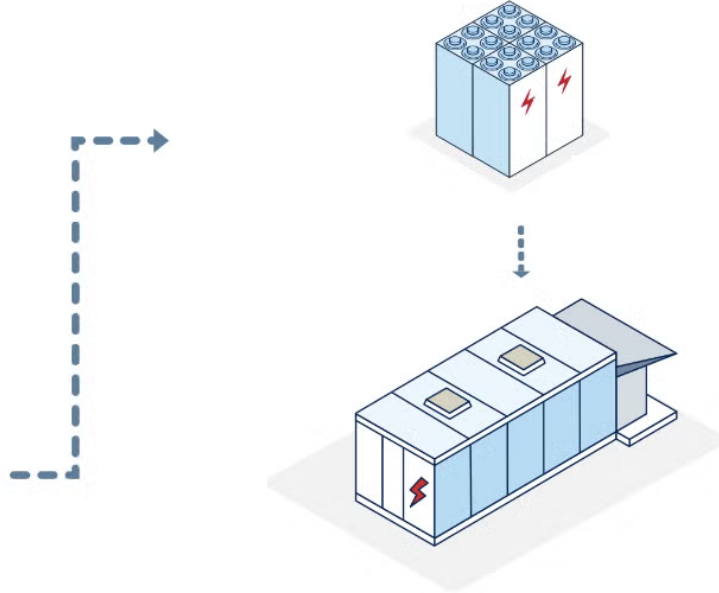
Cell-level test

Cell-level testing evaluates the thermal runaway characteristics of the cell as well as the composition and flammability of the gases.



Unit-level test

Unit-level testing evaluates the likelihood of fire spread between modules, the unit's heat and gas release rates, and the potential for deflagration or re-ignition.



Module-level test

Module-level testing evaluates the tendency of cell thermal runaway propagation, the heat and gas release rate of the module, and the potential danger of ignition or deflagration.

Installation-level test

Installation-level mainly evaluates the effectiveness of the fire protection system, as well as the heat and gas release rate of the system and the danger of deflagration or re-ignition.

The UL9540A test method is recognized in multiple industry standards and codes,

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Choose UL Solutions for UL 9540A testing

UL Solutions conducts the UL 9540A test method at laboratories in the United States, China, Korea, Taiwan, Germany and other countries. For cell to large-scale fire testing, our battery safety experts will work with you to develop a test plan tailored to your specific needs. As a leader in battery safety technology, we offer:

- Full fire testing facilities, eliminating the need for subcontracting.
- Expert engineering and research teams with in-depth knowledge of battery chemistries and fire suppression.
- A proven track record serving fire departments, electrical inspectors and building officials.
- Proactive planning for project requirements and transparency in our proposals.



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LaTanya Schwalb is an expert in product safety certification and UL Standards for stationary batteries, energy storage systems, fuel cells and hydrogen generators.

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Introduction to Revisions of UL 9540A:2025

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Installation Codes and Requirements for Energy Storage Systems (ESS) – FAQs

Answering marketplace questions about evolving ESS safety standards and recent updates to UL 9540A.

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Evolving Large-Scale Fire Test Methods and Regulatory Demands

With confusion in the marketplace regarding safety codes and standards related to ESS, this whitepaper clarifies NFPA 855 requirements for ESS installations.

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e-Book: An Inside Look at the Updates to UL 9540A:2025

Explore the key updates in UL 9540A:2025, including enhanced testing methods and definitions to improve safety in battery energy storage systems and address fire hazards.

[Download e-Book](#)

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