



UL 9540A Test Method Brings Clarity to Industry and Code Authorities

Helps manufacturers and system integrators meet the IFC 2018 and NFPA 855 large scale fire and fault testing by evaluating fire propagation



Increased deployment of energy storage systems have led to field failures in past years, heightening awareness of the dangers of thermal runaway. As this technology moves closer to our homes and places of work, the likelihood of fire propagation needs to be evaluated. The UL 9540A Test Method will provide regulators and code authorities the data they have requested for approval.

Fire departments and building inspectors are concerned over the use of lithium-ion batteries and battery energy storage systems (BESS) to be permanently installed in mixed occupancy or high-rise buildings. As a result, installation codes have been recently updated to require large scale fire testing to evaluate the risk of fire propagation from a faulty unit. These requirements for testing did not include a methodology, which UL has now provided with the publication of the UL 9540A Test Method. The test method for evaluating thermal runaway fire propagation in BESS will bring clarity on the performance of a BESS under a possible thermal event that can occur in the life of the system.

With new mandates in place, UL's fire protection and battery experts help BESS and stationary battery manufacturers navigate the appropriate test method to help prove product compliance quickly and efficiently.



PROVEN METHODOLOGY



Drawing from our history and tradition of safety, UL uses an incremental approach used in other industries, from cell to installation level, to determine the minimum testing needed to prove product compliance.

Level	Activities
Cell	Develop cell thermal runaway initiation technique and characteristics including gas composition
Module	Determine propagation behavior within module and thermal energy release outside of the module.
Unit	Open test configuration of unit to unit fire spread with heat release rate and gas analysis to determine potential for explosion
Installation	Closed room test configuration of unit to unit fire spread with fire mitigation equipment

WHY UL

UL is recognized for our global excellence in battery safety and fire protection disciplines and applying that knowledge to solve complex industry matters. Working with the UL team will help ensure that you have the proper level of testing to meet the International Fire Code (IFC) Section 608 and National Fire Protection Agency (NFPA) 855 criteria for battery systems over the documented thresholds. Our test reports support the key factors that both manufacturers and code authorities seek to understand: the impact of BESS thermal runaway to the built environment and any fire protection mitigation required to contain an event. UL has the researchers, scientists, engineers, facilities, capabilities, and the expertise to work directly with the code authorities to help accelerate technical innovations in the field of energy storage.

UL 9540A STAKEHOLDER SUPPORT

The UL 9540A Test Method was carefully developed by UL with input from key stakeholders to help ensure test plans are suitable. Below are some excerpts from letters of support UL has received for the UL 9540A Test Method:

“The New York City Fire Department welcomes, and supports, the testing methods for evaluating thermal runaway fire propagation for energy storage systems (ESS) described in UL 9540A. The testing data that will be collected from this test can be analyzed and will help to move ESS installation forward in NYC. UL 9540A will allow outdoor and indoor battery systems to be designed in the safest way possible. It will also help code authorities make correct and technically sound decisions.”

**- Lieutenant Paul Rogers, Fire Department
City of New York Hazardous Materials
Operations**

“We believe it is in the best interest of public and firefighter safety to adopt and adhere to UL 9540A.”

**-Fire Chief Thomas C. Jenkins V,
President and Chairman of the Board,
International Association of Fire Chiefs
(IAFC)**



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OR **847.272.8800**, OR VISIT **UL.COM/BESS**