

**JH Solar**

# **Lithium-ion energy storage system standard requirements**



## Overview

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IEC 62619 specifies requirements and tests for the safe production of secondary lithium cells and batteries used in industrial application. Batteries that fall within the scope of the standard include those used for stationary applications, such as uninterruptible power supplies (UPS), electrical.

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This webpage includes information from first responder and industry guidance as well as background information on battery energy storage systems and resources. Access this webpage information in a printable format (pdf) (515.29 KB) . Battery energy storage systems (BESS) stabilize the electrical.

As a basis, electrochemical energy storage systems are required to be listed to UL 9540 per NFPA 855, the International Fire Code, and the California Fire Code. As part of UL 9540, lithium-ion based ESS are required to meet the standards of UL 1973 for battery systems and UL 1642 for lithium.

This document provides an overview of current codes and standards (C+S) applicable to U.S. installations of utility-scale battery energy storage systems. This overview highlights the most impactful documents and is not intended to be exhaustive. Many of these C+S mandate compliance with other.

checklist can support project development. Inspection, commissioning, and final acceptance process. It does not include specifics of battery manufacturer spec sheets or an evaluation of different battery chemistries. Text that provides options for the drafter are presented in (blue parentheses).

follow all applicable federal requirements and Agency-specific policies and procedures All procurements must be thoroughly reviewed by agency contracting and legal staff and should be modified to address each agency's unique acquisition process, agency-specific authorities, and project-specific.

Assists users involved in the design and management of new stationary lead-acid, valve-regulated lead-acid, nickel-cadmium, and lithium-ion battery installations. The focus is the environmental design and management of the installation, and to improve workplace safety and improve battery. What is a lithium-ion battery energy storage system (BESS)?

As the global transition to renewable energy accelerates, lithium-ion battery energy storage systems (BESS) have become critical components in grid stabilization, renewable energy integration, and backup power applications.

What are the IEC standards for secondary lithium cells & batteries?

The following is a partial listing of applicable IEC standards: IEC 63056, Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage systems.

What are energy storage battery certifications?

Global certifications ensure that energy storage batteries meet stringent safety, performance, and environmental standards, mitigating these risks while facilitating market access. 2. Key Energy Storage Battery Certifications Worldwide UN38.3 (United Nations Transport Safety Standard).

What tests are required for lithium batteries in international shipping?

Purpose: Required for batteries in international shipping to ensure they can withstand transportation stress. Tests: Altitude simulation, thermal cycling, vibration, impact, short circuit, and crush tests. Applicability: All lithium batteries (mandatory for shipping). IEC 62619 (Industrial Lithium Battery Safety Standard).

How safe is a lithium battery?

According to Mr. Takefumi Inoue who helped lead the development of IEC 62619 in IEC SC21A WG5, "The safety of lithium secondary cells and battery systems requires the consideration of intended use and reasonably foreseeable misuse.

Do energy storage systems need to be certified?

U.S. fire and electrical codes require that energy storage systems be listed, meaning the product must be tested by a Nationally Recognized Testing

Laboratory (a private-sector organization recognized by the Occupational Safety and Health Administration) and certified to meet consensus-based test standards.

## Lithium-ion energy storage system standard requirements

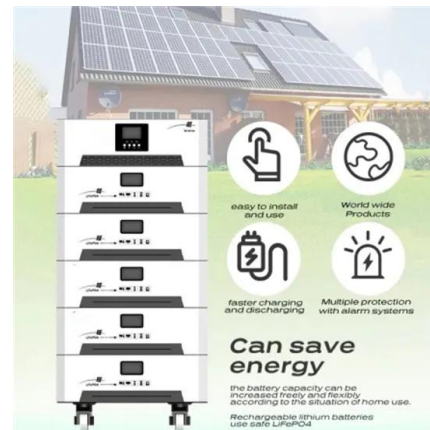


### NEW YORK CITY FIRE DEPARTMENT

Because of their energy density (high-energy generation considering the battery's size and weight), lithium-ion batteries are increasingly being used in a wide range of applications, ...

### Energy Storage Systems , OSFM

We hosted a Battery Energy Storage Systems Fire Safety Symposium on July 24, 2025, at the California Natural Resources Agency in Sacramento, CA. Attendees gained valuable insights on: - Improving emergency ...



### New GB Standards for Battery

These include a number of new GB standards that set certification requirements for various battery and energy storage systems. CCC certification is required for many battery ...

## Lithium-ion Battery Storage Technical Specifications

This document is meant to be used as a customizable template for federal government agencies seeking to procure lithium-ion battery energy storage systems (BESS).



## Customizable Technical Specifications for Lithium-Ion Battery ...

Battery Energy Storage System Evaluation Method Report describes a proposed method for evaluating the performance of a deployed BESS or solar PV-plus-BESS system.



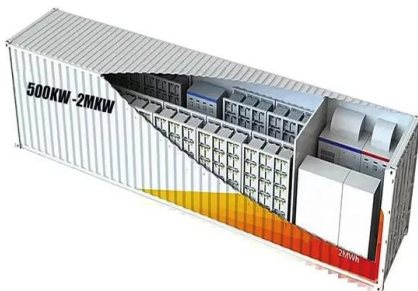
## Summary: ESS Standards

Summary: ESS Standards As a basis, electrochemical energy storage systems are required to be listed to UL 9540 per NFPA 855, the International Fire Code, and the California Fire Code. As part of UL 9540, lithium-ion ...



## U.S. Codes and Standards for Battery Energy Storage Systems

This document provides an overview of current codes and standards (C+S) applicable to U.S. installations of utility-scale battery energy storage systems. This overview highlights the most ...



## EU Battery Regulation (2023/1542) 2024 ...

Uncover the essential EU battery regulation (2023/1542) 2024 requirements and ensure compliance with our expert insights and tailored solutions.



## Fire Codes and NFPA 855 for Energy Storage ...

Fire codes and standards inform energy storage system design and installation and serve as a backstop to protect homes, families, commercial facilities, and personnel, including our solar-plus-storage ...

## Understand the codes, standards for battery ...

IFC Section 1207 addresses energy storage and the following highlights critical sections and elements: IFC 1207.1.3 features a table defining when battery systems must comply with this code section. It ...



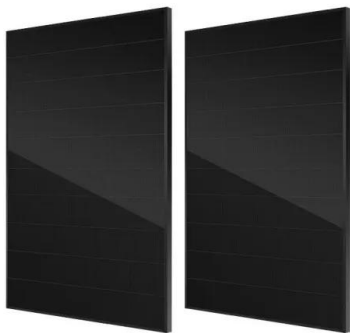
## Lithium-ion Battery Energy Storage Safety ...

Contents hide 1 1.Features of the current energy storage system safety standards 1.1 1.1 IEC safety standards for energy storage systems Electrochemical energy storage system has the characteristics of ...

## Overview of battery safety tests in standards for stationary ...

Batteries for stationary battery energy storage systems (SBESS), which have not been covered by any European safety regulation so far, will have to comply with a number of safety tests. A

...



## IEC publishes standard on battery safety and ...

A move towards a more sustainable society will require the use of advanced, rechargeable batteries. Energy storage systems (ESS) will be essential in the transition towards decarbonization, offering the ability ...

## Safety Standards for Lithium-ion Electrochemical Energy Storage Systems

Safety Standards for Lithium-ion Electrochemical Energy Storage Systems Safety Standards for Lithium-ion Electrochemical Energy Storage Systems Introduction Summary: ESS Standards



## UL 1973: Batteries for Use in Stationary and Motive Auxiliary ...

UL 1973 is the safety standard for battery systems used in stationary applications, such as energy storage systems. ESS units listed to UL 9540 standards must meet the requirements in UL ...

## Battery Energy Storage Systems: Main ...

2 ??? Battery Energy Storage Systems, or BESS, help stabilize electrical grids by providing steady power flow despite fluctuations from inconsistent generation of renewable energy sources and other disruptions. While ...



## Utility-scale battery energy storage system (BESS)

Introduction Reference Architecture for utility-scale battery energy storage system (BESS) This documentation provides a Reference Architecture for power distribution and conversion - and ...

## Lithium Battery Regulations and Standards in the US

Within the complex system of lithium battery regulations and standards in the United States, from ensuring safety and performance to cultivating consumer trust, these regulations guide manufacturers in ...



## Explosion Control Guidance for Battery Energy Storage ...

INTRODUCTION Lithium-ion batteries (LIBs) are the most common type of battery used in energy storage systems (ESS) due to their high energy density, long cycle life, and comparative ...

## IEC publishes standard on battery safety and ...

Energy storage systems (ESS) will be essential in the transition towards decarbonization, offering the ability to efficiently store electricity from renewable energy sources such as solar and wind. ...



## UL 9540: Energy Storage Systems and Equipment

As stated in the previous section, UL 9540 is the system level safety standard for ESS and equipment. Different components within the ESS may be required to meet safety standards ...

## Lithium Battery Regulations and Standards in the EU: An Overview

Guide to regulations, standards, lab testing and labelling requirements for lithium batteries sold in the European Union.



## Energy Storage NFPA 855: Improving Energy Storage ...

The depth of this standard makes it a valuable resource for all Authorities Having Jurisdiction. The focus of the following overview is on how the standard applies to electrochemical (battery) ...

## EASE Guidelines on Safety Best Practices for Battery Energy Storage Systems

The EASE Guidelines on Safety Best Practices for Battery Energy Storage Systems (BESS) are designed to support the safe deployment of outdoor, utility-scale lithium-ion (Li-ion) BESS ...



## Codes & Standards Draft - Energy Storage Safety

Covers requirements for battery systems as defined by this standard for use as energy storage for stationary applications such as for PV, wind turbine storage or for UPS, etc. applications.

## The Evolution of Battery Energy Storage Safety Codes and ...

That said, the evolution in codes and standards regulating these systems, as well as evolving battery system designs and strategies for hazard mitigation and emergency response, are ...



## [New GB Standards for Battery](#)

These include a number of new GB standards that set certification requirements for various battery and energy storage systems. CCC certification is required for many battery systems in order to be ...

## Samsung UL9540A Lithium-ion Battery Energy Storage ...

Overview The Samsung SDI 128S and 136S energy storage systems for data center application are the first lithium-ion battery cabinets to fulfill the rack-level safety standards of the UL9540A ...



## EASE Guidelines on Safety Best Practices for ...

The EASE Guidelines on Safety Best Practices for Battery Energy Storage Systems (BESS) are designed to support the safe deployment of outdoor, utility-scale lithium-ion (Li-ion) BESS across Europe. These guidelines aim ...

### Summary: ESS Standards

As part of UL 9540, lithium-ion based ESS are required to meet the standards of UL 1973 for battery systems and UL 1642 for lithium batteries. Additionally, all utility interactive ESS are required to be listed and labeled ...



## FAQ: Texas battery energy storage systems

What's a battery energy storage system? A battery energy storage system (BESS) stores energy in rechargeable batteries. A system typically has battery cells, modules, racks, inverters, and control systems.

## Energy Storage Safety Strategic Plan

The Department of Energy Office of Electricity Delivery and Energy Reliability Energy Storage Program would like to acknowledge the external advisory board that ...



## Energy Storage , UL Standards & Engagement

These systems combine large numbers of lithium-ion battery cells to store large amounts of energy relative to their size. However, these batteries can overheat and explode or catch on ...

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