

**JH Solar**

# Energy storage battery combustion test



## Overview

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Global energy storage innovator HiTHIUM has set a new industry standard by completing the world's first all open-door large-scale fire test for its ∞Block 5MWh Battery Energy Storage System (BESS). The landmark test—designed to address escalating concerns about thermal runaway and BESS.

Global energy storage innovator HiTHIUM has set a new industry standard by completing the world's first all open-door large-scale fire test for its ∞Block 5MWh Battery Energy Storage System (BESS). The landmark test—designed to address escalating concerns about thermal runaway and BESS.

June 11, 2025, Shanghai — At the SNEC exhibition, Hithium officially unveiled the full results of the world's first open-door combustion test for its ∞Block 5MWh energy storage system during the "Leap Forward, Safety First" product safety technology seminar. The release included the complete test.

To rigorously validate the safety performance of its commercial and industrial energy storage system, under extreme fire scenarios, Sigenergy recently completed a full-scale combustion test on its SigenStack system. Despite the complete removal of active safety mechanisms, the system successfully.

A Chinese energy storage technology firm has completed the world's first all-open-door large-scale fire test of its ∞Block 5MWh battery energy storage system (BESS). The test conducted on Hithium energy storage device offers a high-stakes technical model to inform future product safety standards.

Hithium, a prominent global provider of energy storage technology, has successfully finished the first large-scale, all-open-door fire test of its ∞Block 5MWh battery energy storage system (BESS). This groundbreaking accomplishment marks a turning point in the worldwide energy storage sector and.

In June 2024, Sungrow took the bold step of deliberately combusting 10 MWh of its PowerTitan 1.0 liquid-cooled battery energy storage system (BESS), becoming the first company globally to conduct a large scale burn test on an energy storage system. Recently, the company invested approximately.

The modular system design approach of Sigenergy's SigenStack has now been verified by full-scale fire testing and third-party validation. Its architecture demonstrates a compelling direction for mitigating thermal risk and enhancing system-level resilience for commercial and industrial (C&I) energy. Why did NMC modules and the battery catch fire?

Note that NMC modules and the battery caught fire as indicated by the heat release rate measurements in Table 2. Fire experienced by the modules and the battery caused significant levels of CO<sub>2</sub> due to the combustion of vented gases. Flammable gases such as H<sub>2</sub> and hydrocarbons were measured, despite being released into a flaming environment.

Does a battery-level LFP test cause fire?

During the battery-level LFP test, only smoke but no fire was observed due to the cells enclosed in a sealed battery, which prevents the gases from combusting in ambient air. During heating tests carried out in an inert environment, a substantial quantity of flammable gases was detected from both cell chemistries when thermal runaway occurred.

Are lithium-ion battery fires toxic?

Larsson, F.; Andersson, P.; Blomqvist, P.; Mellander, B. E. Toxic fluoride gas emissions from lithium-ion battery fires. *Sci. Rep.* 2017, 7, 10018, DOI: 10.1038/s41598-017-09784-z *Scientific reports* (2017), 7 (1), 10018 ISSN: . Lithium-ion battery fires generate intense heat and considerable amounts of gas and smoke.

Can gas sensors detect battery failure?

The response of several com. available gas sensors is tested in four battery failure cases: unwanted electrolysis of voltage carrying parts, electrolyte vapor, first venting of the cell and the TR. The expts. show that battery failure detection with gas sensors is possible but depends highly on the failure case.

What causes a high CO<sub>2</sub> level in a battery?

Fire experienced by the modules and the battery caused significant levels of CO<sub>2</sub> due to the combustion of vented gases. Flammable gases such as H<sub>2</sub> and hydrocarbons were measured, despite being released into a flaming environment. These gases were released at high velocities, which could have minimized the residence time needed for oxidation.

How much gas does a 25 Ah battery produce?

In the NMC chemistry, the total volume of gases generated from the 25 Ah cell was 41 L. Note that the larger gas volume from the NMC cell may be attributed to the larger battery capacity. The largest gas component measured was hydrogen (36.0 vol %), followed by carbon dioxide (26.7 vol %) and carbon monoxide (23.8 v%).

## Energy storage battery combustion test

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### Effects of ventilation conditions on thermal runaway of lithium-ion

This study investigates the effects of individual battery combustion on the overall temperature and gas concentration in a containerized lithium-ion battery energy storage ...

### Battery Energy Storage Systems: Main ...

2 ???· This webpage includes information from first responder and industry guidance as well as background information on battery energy storage systems (challenges & fires), BESS installation considerations, ...



### World's first all open-door large-scale fire test of 5MWh battery

A Chinese energy storage technology firm has completed the world's first all-open-door large-scale fire test of its ?Block 5MWh battery energy storage system (BESS).

### A Review on the Recent Advances in Battery ...

In general, energy density is a key component in battery development, and scientists are constantly developing new methods and

technologies to make existing batteries more energy proficient and safe. This will make it ...



### Intrinsic flame-retardant phase change materials for battery ...

Phase change materials (PCMs) feature high energy storage density and tunable phase change temperatures, making them promising passive thermal management materials ...

### Energy storage fire suppression system

1. Causes of fire in battery energy storage system The main cause of fires in battery energy storage are fires caused by thermal runaway of lithium batteries in energy storage, and fires ...



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### Experimental and simulation study on internal thermal runaway

The combustion and explosion of battery packs are undesired outcomes for both vehicle owners and automakers [16]. Automakers aspire to design power battery packs that are ...

## HiTHIUM Completes the First All-Open-Door, Large-Scale Fire Test

Hithium, a prominent global provider of energy storage technology, has successfully finished the first large-scale, all-open-door fire test of its ?Block 5MWh battery ...



## Hithium Sets New Safety Standards with the World's First Open ...

Hithium has successfully conducted the world's first open-door large-scale fire test, setting a new benchmark in battery energy storage safety standards and innovation.

## Evaluating Fire and Smoke Risks with Lithium-Ion ...

The test method was based on ANSI/CAN/UL 9540A, the Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, edition 4, for cell-level (section 7) and ...



## A review of battery energy storage systems and advanced battery

This review highlights the significance of battery management systems (BMSs) in EVs and renewable energy storage systems, with detailed insights into voltage and current ...

## Characteristics and mechanisms of as well as evaluation ...

Fig. 4 displays the internal deformation and ISC induced in a pouch battery during a ball-head squeezing test. As the stress reaches the extrusion surface, the damage to the ...



## Evaluating Fire and Smoke Risks with Lithium-Ion ...

A very detailed description of the test setup, methodology, and calculation of heat release rates and burning velocities is provided in the Supporting Information with inclusion of the relevant references.

## Sungrow achieves success in world's largest ...

In June 2024, Sungrow took the bold step of deliberately combusting 10 MWh of its PowerTitan 1.0 liquid-cooled battery energy storage system (BESS), becoming the first company globally to conduct a ...



## Full-scale experimental study on suppressing lithium-ion battery ...

Billions of vehicles powered by internal combustion engines consume about 87% of the worldwide available petroleum and cause many environmental problems, including air ...

## Large-Scale Fire Testing Procedure: CSA TS-800:24

The TS-800 document provides a standardized procedure to observe and document the effects of a fire in one battery energy storage system (BESS) on surrounding units and external exposures.



51.2V 150AH, 7.68KWH

## Envision Sets Record with 49-Hour Fire Test in Energy Storage ...

Envision Energy demonstrates unparalleled BESS resilience and environmental safety in a 49-hour test, setting a new fire safety standard.

## Assessment of the explosion risk during lithium-ion battery fires

Through the experimental results, we classified the fire stages based on the combustion characteristics, and introduced a parameter that assesses battery fire ...



## Hithium Innovates Safety Standards with First All Open-Door ...

Hithium has achieved a pioneering milestone by completing the world's first large-scale fire test on its battery energy storage system, setting new safety benchmarks.

## Sungrow Achieves Success in World's Largest ...

In June 2024, Sungrow took the bold step of deliberately combusting 10 MWh of its PowerTitan 1.0 liquid-cooled battery energy storage system (BESS), becoming the first company globally to conduct a ...



## Multidimensional fire propagation of lithium-ion phosphate ...

In electrochemical energy storage stations, battery modules are stacked layer by layer on the racks. During the thermal runaway process of the battery, combustible mixture ...



## Experimental study of gas production and flame behavior induced ...

With the popularization and application of lithium-ion batteries in the field of energy storage, safety issue has attracted more attention. Thermal runaway is the main cause ...



## Sungrow achieves success in world's largest ...

In June 2024, Sungrow deliberately combusted 10 MWh of its PowerTitan 1.0 liquid-cooled battery energy storage system, becoming the first company globally to conduct a large scale burn test on an energy ...



## Combustion characteristics of lithium-iron-phosphate batteries ...

The HRR test system is used to calculate HRR with the oxygen consumption principle, and the energy produced by consuming a unit mass of oxygen is 13.1 MJ/kg. Fig. 6 ...



## HiTHIUM Completes the the World's First All Open-Door Large ...

June 5, 2025, Xiamen, China - HiTHIUM, a leading global energy storage technology company, has completed the world's first all open-door large-scale fire test of its ?Block 5MWh battery ...

## Battery Pack-Level Fire Safety Proven in SigenStack Stress Test

To rigorously validate the safety performance of its commercial and industrial energy storage system, under extreme fire scenarios, Sigenergy recently completed a full ...



## Battery Energy Storage System Evaluation Method

Executive Summary This report describes development of an effort to assess Battery Energy Storage System (BESS) performance that the U.S. Department of Energy (DOE) Federal ...

## DOE ESHB Chapter 16 Energy Storage Performance Testing

1. Introduction Battery energy storage systems (BESSs) are being installed in power systems around the world to improve efficiency, reliability, and resilience. This is driven in part by: ...



### CN117074604A

The device comprises a clamping mechanism, a heating plate, an ignition mechanism, a protection mechanism, a charging and discharging machine, an infrared thermal imager, a ...

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

EXECUTIVE SUMMARY Lithium-ion battery (LIB) energy storage systems (BESS) are integral to grid support, renewable energy integration, and backup power. However, they present ...



## Evaluating Fire and Smoke Risks with Lithium-Ion Cells, ...

The test method was based on ANSI/CAN/UL 9540A, the Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, ...



## Battery Energy Storage Systems Explosion Hazards

The UL 9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems provides a standard for such testing. BESS cells, modules, and racks - ...



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