

## Solar Energy South Africa

# Fire hazards of lithium batteries for energy storage



## Overview

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Lithium-ion batteries may catch fire if they are overcharged. The fire is self-sustaining and cannot be easily extinguished by water spray or use of a fire extinguisher. Are lithium-ion batteries a fire hazard?

se and in storage around the world. Fortunately, fire related incidents with these batteries are infrequent, but the hazards associated with lithium-ion battery cells, which combine flammable electrolyte and significant stored energy, can lead to a fire or explosion from a single-point failure. These hazards need to be understood in order to suitably

Are lithium-ion batteries flammable?

Fire Hazard of Lithium-ion Battery Energy Storage Systems: 1. Module to Rack-scale Fire Tests Lithium-ion batteries (LIB) are being increasingly deployed in energy storage systems (ESS) due to a high energy density. However, the inherent flammability of current LIBs presents a new challenge to fire protection system design.

Are lithium ion batteries dangerous?

As the number of installed systems is increasing, the industry has also been observing more field failures that resulted in fires and explosions. Lithium-ion batteries contain flammable electrolytes, which can create unique hazards when the battery cell becomes compromised and enters thermal runaway.

Why are lithium-ion battery fires difficult to quell?

Due to the self-sustaining process of thermal runaway, Lithium-ion battery fires are also difficult to quell. Bigger batteries such as those used in electric vehicles may reignite hours or even days after the event, even after being cooled. Source: Firechief® Global.

What happens if a lithium ion battery goes bad?

Lithium-ion batteries are electro-chemical energy storage devices with a

relatively high energy density. Under a variety of scenarios that cause a short circuit, batteries can undergo thermal-runaway where the stored chemical energy is converted to thermal energy. The typical consequence is cell rupture and the release of flammable and toxic gases.

Does your fire risk assessment cover lithium-ion battery fires?

A survey of more than 500 organisations carried out between September 2023 and February 2024 revealed that 71 per cent of respondents had not updated their fire risk assessments to cover the risk of Lithium-ion battery fires, with just 15 per cent having done so and a further 14 per cent unsure.

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### Effect of ambient pressure on the fire characteristics of lithium ...

As lithium-ion battery energy storage gains popularity and application at high altitudes, the evolution of fire risk in storage containers remains uncertain. Study of the fire hazards of ...

### Lithium-ion batteries: a growing fire risk

To help mitigate the risk of Lithium-ion battery fires, Firechief® Global has developed a proprietary eight-step Halo(TM) Battery Safety Action Plan which includes proactive actions, such as assessing the scale of risk that's ...



### Safety of Grid Scale Lithium-ion Battery Energy Storage Systems

- 4 - June 5, 2021 1. Introduction Lithium-ion (Li-ion) batteries are currently the battery of choice in the 'electrification' of our transport, energy storage, mobile telephones, mobility

### Lithium-ion batteries: a growing fire risk

Lithium-ion batteries are now firmly part of daily life, both at home and in the workplace. They are in portable devices, electric vehicles and

renewable energy storage systems. Lithium-ion batteries have many ...



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