

# Occupational hazards in the production of lithium batteries

Are lithium-ion batteries a fire hazard?

Despite protection by battery safety mechanisms, fires originating from primary lithium and lithium-ion batteries are a relatively frequent occurrence. This paper reviews the hazards associated with primary lithium and lithium-ion cells, with an emphasis on the role played by chemistry at individual cell level.

What are the risks associated with lithium batteries?

Although definitive evidence on the actual mechanism initiating the events is often lacking, incidents can at times be linked to incorrect handling, storage and packaging practices that may lead to mechanical damage, water ingress, and/or internal or external short-circuit of charged batteries.

## 2. Hazards associated with primary lithium cells

How can lithium-ion batteries prevent workplace hazards?

Whether manufacturing or using lithium-ion batteries, anticipating and designing out workplace hazards early in a process adoption or a process change is one of the best ways to prevent injuries and illnesses.

How many lithium-ion battery incidents were reported during aircraft transport?

Incidents during aircraft transport of primary lithium and lithium-ion batteries were reviewed in the National Transportation Safety Board (NTSB) incident report (NTSB, 2007). According to this US FAA document, 82 incidents involving all types of batteries were reported within the aviation industry.

What are the risks associated with lithium-ion cells?

Hazards associated with lithium-ion cells can originate from the following side reactions: Molten lithium can form in the event of overcharging metal lithium cells due to the low melting point of lithium metal (180 °C).

What are the OSHA standards for lithium-ion batteries?

While there is not a specific OSHA standard for lithium-ion batteries, many of the OSHA general industry standards may apply, as well as the General Duty Clause (Section 5(a)(1) of the Occupational Safety and Health Act of 1970). These include, but are not limited to the following standards:

The rise in safety and health cases is predictable for a US industry in its infancy--the oldest active EV battery plant dates back to 2010--and without an experienced workforce, said Robert Galyen, the retired chief technical officer of Contemporary Amperex Technology Company Limited, the world's largest lithium-ion battery manufacturer and now a ...

Hazards Inorganic lead dust is the most significant health exposure in battery manufacture. Lead can be absorbed into the body by inhalation and ingestion. Inhalation of airborne lead is ...

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The occupational safety risks vary over the LIB value chain: In the phase in which battery chemicals are handled, the chemicals (cobalt, tremolite, nickel, arsenic, manganese, lithium, ...

health risks in lithium battery industry has rarely been reported. The composition of lithium batteries is complex and involves large numbers of compounds. Besides the traditional ...

Washington -- OSHA has released a Safety and Health Information Bulletin warning employers and workers of potential fire and explosion hazards stemming from lithium batteries used to power small or wearable ...

These volumes illustrate a scale of mounting risks and challenges associated with a) sourcing raw materials, b) production, c) safety of use and d) recycling/repurposing of used batteries. METHODS

Occupational, environmental, and toxicological health risks of mining metals for lithium-ion batteries: a narrative review of the Pubmed database August 2024 Journal of Occupational Medicine and ...

Damage to lithium-ion batteries can occur when the batteries themselves or the environment around the batteries is below freezing (32°F) during charging. Charging in temperatures below ...

Hazards associated with primary lithium and lithium-ion cells have materialised not only during use at the intended application, but also during transport and storage of new ...

OSHA issued a safety and health bulletin in 2019 to raise awareness about the hazards and controls of lithium batteries. In addition, fire, electrical, and building codes, as well as other standards (e.g., Underwriters Laboratories (UL) and National Electrical Manufacturers Association (NEMA)), continue to evolve to reduce the risks around the design, use, and ...

production of lithium ion cells to be used [8-10]. A major challenge in processing sulfides is their high reactivity with water, forming toxic and corrosive hydrogen sulfide (H<sub>2</sub>S) [11,12]. This affects not only product quality and chemical resistance of the production equipment, but also the occupational safety of the employees in production.

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