



Lithium-ion batteries

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering, and technology, all working together to drive innovation in a modern world.

Recent news stories across the US have highlighted fires and injuries involving lithium-ion batteries that are used in consumer products. An apartment building fire related to electric scooters or bicycles being stored and charged indoors is just one example. It's important to understand the risks and loss prevention measures for the safe use of lithium-ion consumer products.

Uses for lithium-ion batteries

Lithium-ion batteries are lightweight, charge quickly, have high power density, and a long battery life. These features make lithium-ion batteries ideal for many consumer products such as:

- Lawncare equipment
- Power tools
- Cell phones
- Laptops
- Scooters
- Cameras
- E-cigarettes
- Portable lights
- Remote-controlled toys
- Drones

Safety concerns

Lithium-ion batteries use a flammable electrolyte that can increase fire and safety risks. If used improperly, lithium-ion batteries can overheat, catch fire, and/or explode. Overheating one cell can quickly escalate to all adjoining cells through a process called "thermal runaway."

To reduce these risks, safety devices or circuits must be designed into the battery packs and respective chargers. The safety devices can be internal fuses, pressure relief vents and positive temperature coefficient (PTC) limiters and battery management systems (BMS). Although safety features are built into lithium-ion battery products, there is still the risk things could go wrong, causing fires or injuries.

Always make sure lithium-ion battery products are listed by a Nationally Recognized Testing Laboratory such as UL. This will ensure that the product complies with the appropriate safety standards for the product. It's important that the manufacturer's instructions included with the product are always followed.

Manufacturer's instructions typically include:

– Only charge the battery with the charger supplied with the product

The battery and the charger are designed to work together safely. Mismatching the battery with a different charger can result in improper charging currents or bypassed safety features, resulting in overheating and possible explosion.

– Only use the battery with the product it was designed for

Using a battery with the wrong device can cause excessive current draw from the battery. This could lead to overheating and overpressuring the battery, resulting in the venting of combustible vapors.

– Do not use a battery that has visible damage on the outer case

When the battery case is damaged or punctured, internal short-circuits can occur. This can lead to overheating or explosion of the individual cells that make up the battery pack.

– Do not short-circuit the battery terminals

Keep the battery terminals away from any conductive objects when the battery is not installed in the product or in storage. Short-circuiting the terminals can lead to excessive currents that can overheat or explode the battery.

– Only charge the battery within the upper and lower ambient temperature limits in the included instructions

The upper and lower ambient temperature limits for charging are based on the manufacturer's design to safely operate the battery and charger combination without overheating or overcharging.

– Properly dispose of damaged or defective batteries

Improperly disposed of batteries can cause fires in the waste handling centers. Check with your local sources for battery drop-off recycling centers. Many big-box stores that sell battery-operated products usually recycle the old batteries for free.

Other manufacturer safety recommendations are included in the instructions supplied with the product and must be read and followed. Additional lithium-ion battery safety and disposal recommendations may be available by contacting the local fire marshal in your jurisdiction.

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