CIRSA HAZARD ALERT

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Hazard Alert - Lithium-Ion Battery Safety

Lithium-ion batteries are increasingly found in devices and systems that the public and workforces use or interact with daily. While these batteries provide an effective and efficient power source, the likelihood of them overheating, catching on fire, and even leading to explosions increases when damaged or improperly used, charged, or stored. This guideline intends to provide our members of lithium-ion (Li-ion) and lithium polymer (LiPo) cells and battery packs with enough information to safely handle them under normal conditions.

Best Practices

- Purchase batteries from a reputable manufacturer or supplier, and associated equipment is tested in accordance with an appropriate test standard (e.g., UL 2054) and, where applicable, certified by a Nationally Recognized Testing Laboratory (NRTL) and rated for their intended uses.
- Example of approved test standards:

- Avoid batteries shipped without protective packaging (i.e., rigid plastic or equal).
- Inspect batteries upon receipt and safely dispose of damaged batteries.
- Always follow the manufacturer's instructions
- Only use batteries and the cord designed for the device.
- Stop using the battery if you notice an odor, change in color, too much heat, change in shape, leaking, or odd noises, and remove it from service.
- If batteries are damaged, remove them from service.
- Remove cells and pack from chargers promptly after charging is complete. Do not use the charger as a storage location.
- Do not parallel charge batteries of varying age and charge status.

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Lithium-Ion Battery Safety (cont.)

Storage

- Store batteries away from combustible materials and in a compliant battery charging cabinet.
- Remove batteries from the device for long-term storage.
- Store the batteries at temperatures between 5°C and 20°C (41°F and 68°F).
- Separate fresh and depleted cells (or keep a log).
- If practical, store batteries in metal storage cabinets or fire-safe storage bags.
- Avoid bulk storage in office areas.
- Have spill containment in the event of battery leaking while stored.
- Visually inspect battery storage areas at least weekly.
- Charge batteries in storage to approximately 50% of capacity at least once every six months.

Disposal

- Do not put lithium-ion batteries in the trash.
- Recycle with a certified battery electronics recycler.
- Take them to a battery recycling location or contact your community for disposal instructions.
- Do not put discarded batteries in piles.

Training

- Ensure that workers who use or handle lithium-powered devices, cells, or batteries are adequately trained. Training should include:
  - Proper use, storage, and disposal.
  - Safety and emergency procedures.
  - Hazards associated with lithium–ion batteries.
  - How to identify if the battery is damaged or should not be in use.
  - How to identify National Recognized Testing Laboratory (NRTL) certifications for batteries, charges, and associated equipment, where applicable.

Firefighting Measures

- Lithium-ion batteries contain a small amount of lithium metal; in case of a fire, they can be doused with water. Lithium-metal batteries, on the other hand, require a Class D fire extinguisher.
- Water interacts with lithium and only stops the fire from spreading.
- If other combustibles catch fire due to the lithium battery, use the appropriate extinguishing agent to douse these secondary fires. It is important to address each type of fire with the appropriate extinguishing agent.
- Only trained and qualified personnel should attempt to fight a lithium-metal or lithium-ion battery fire.

Resources

https://www.osha.gov/sites/default/files/publications/shib011819.pdf
https://www.nfpa.org/-/media/Files/Public-Education/Resources/Safety-tip-sheets/LithiumIonBatterySafety.ashx
https://ehs.mit.edu/wp-content/uploads/2019/09/Lithium_Battery_Safety_Guidance.pdf
https://blog.storemasta.com.au/dangers-associated-lithium-ion-batteries
https://www.thecompliancecenter.com/lithium-battery-catches-fire/

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