

Safety

NEWSLETTER

Battery Safety and Lithium-Ion Fire Prevention



Lithium-Ion batteries have become essential in today's workplace and everyday lives. These batteries power many of the tools and devices county employees use every day such as: radios, laptops, power tools, scanners, tablets, inspection equipment, maintenance tools, and emergency gear. Their light weight and quickcharging abilities make them extremely convenient, whether you're in an office, patrol vehicle, maintenance garage, or out in the field.

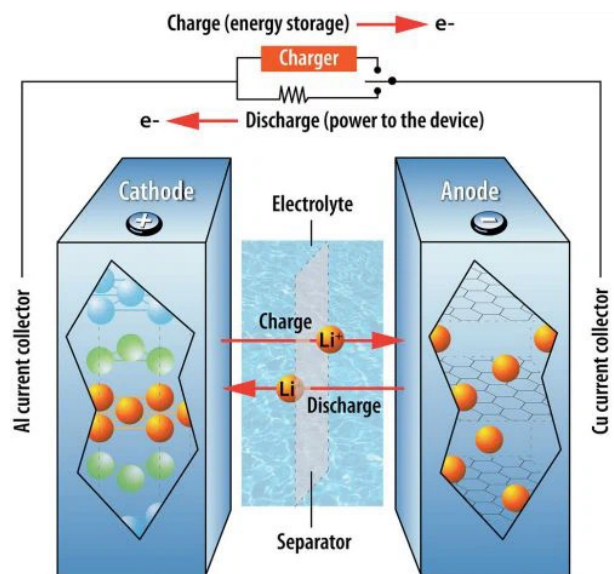
Since these batteries store so much energy, they can become fire hazards if they're not used, charged, or stored correctly. Fires involving lithiumion batteries can start suddenly and produce intense flames, toxic smoke, and loud popping sounds. Because these incidents usually happen without warning, the best protection is knowing what to look for and practicing good handling habits.

This newsletter will cover what lithium-ion batteries are, causes of failures, OSHA's current requirements and expectations, fire prevention, and best practices for safe handling, charging, storing and disposal.

What are lithium-ion batteries and how do they work?

Lithium-ion batteries are rechargeable batteries that store and release energy by moving lithium ions between two internal components—a positive electrode (cathode) and a negative electrode (anode). The electrodes are flammable and can carry large amounts of chemical energy. When a lithium-ion battery is in use, lithium ions move from the anode to the cathode, creating a flow of electrons that powers devices. When charging, this process reverses, forcing ions back to the anode.

What makes lithium-ion batteries unique is that they are not single use like most traditional batteries. They offer rechargeability and provide long-lasting power. This offers more efficient and sustainable energy.



Common Causes of Battery Problems at Work

Lithiumion battery failures usually happen because of everyday situations that don't seem dangerous at first. In workplaces, common causes include:

- **Physical Damage** - This is the #1 cause of workplace battery failures. Examples:
 - A radio gets knocked off a desk.
 - Tools bounce around in the back of a truck.
 - A battery is crushed under equipment.
 - A device falls from a ladder or pocket.

Even when the outside looks fine, internal layers can be damaged.

- **Using the Wrong Charger** - Using a charger that “seems to fit” or plugging devices into unknown power sources (like chargers found in public buildings) can overheat the battery or force too much current inside it.
 - **Heat Exposure** - Common examples include:
 - Leaving devices inside work trucks during hot weather
 - Storing batteries near boilers, heaters, or welding areas
 - Charging inside closed cabinets with no ventilation
- **Aging Batteries** - As batteries get old, they struggle to hold charge and generate more heat. Older batteries fail much more easily than newer ones.
- **Improper Storage** - Throwing used batteries into a drawer or toolbox can cause short circuits, sparks, contact with metal tools, and increased fire risk. A single damaged battery stored with others can cause multiple units to ignite.
- **Ignoring Manufacturer Recalls** - When a manufacturer discovers a defect, recalled batteries must be removed immediately. They should never stay in circulation “until they fail.”

What OSHA Expects from Employers

Even though OSHA does not yet have a standalone lithiumion battery rule, several existing regulations still apply. OSHA expects workplaces to manage battery hazards the same way they manage chemical, electrical, and fire risks.

- **General Duty Clause** - Employers must keep workers safe from known hazards. Battery fires are a well-documented hazard, so controls must be in place.
- **Hazard Communication (HazCom)**

Lithiumion batteries count as chemical containers. This means:

- Employees need training on their hazards.
- Workers must know where SDS sheets are stored.
- Batteries must be labeled and stored properly.

- **Electrical Safety Rules**

OSHA requires safe use of all charging equipment, outlets, and cords. Workers should avoid:

- Damaged cables
- Daisychaining power strips
- Charging next to combustibles
- Using personal chargers at work unless approved

- **OSHA Recordkeeping**

If a lithiumion battery overheats, smokes, or catches fire, the incident may need to be recorded under OSHA's injury and illness rules. OSHA's expectation is straightforward: if a workplace uses lithium-powered tools or equipment, employees must be trained, and employers need clear procedures in place to manage battery hazards safely.

Simple Best Practices for Charging, Storing, and Using Batteries

Many workplace battery fires are completely preventable with a few simple steps:

Inspect Batteries Often - Check for:

- Bulging or swelling
- Cracks or punctures
- Leaking fluid
- Burn marks.
- Strange smells
- Overheating during use

If anything looks "off," remove it from service immediately.

Charge in Safe Areas - Charging stations should:

- Be in open, ventilated spaces.
- Be away from exits or emergency equipment.
- Stay clear of paper, rags, cardboard, or chemicals.
- Use ONLY the approved charger.
- Chargers should never be placed on flammable surfaces

If a battery gets hot, unplug it and report it.

Store Correctly - Workers should:

- Store batteries in designated bins.
- Keep them away from metal tools and sharp objects.
- Avoid direct sunlight and hot vehicles.
- Keep damaged batteries in fireresistant containers.

Don't Mix Damaged and Good Batteries - A single damaged cell can ignite nearby units, creating a larger fire.

Dispose of Batteries Safely - Never toss lithiumion batteries in the trash. Counties typically have:

- Dropoff points.
- Recycling bins
- Collection programs for departments

Ask maintenance or safety for the correct location.

Why We Need a Battery Safety Program

Since batteries are used across nearly every department, it's important to have a consistent system to manage them. A strong battery safety program includes:

Written Rules - Guidelines should cover:

- How to charge batteries
- Where batteries can be stored
- What to do with damaged ones
- How to dispose of them
- Approved chargers and equipment

Annual Training - Training should explain:

- Warning signs of battery failure
- What thermal runaway looks like
- How to evacuate safely
- When and how to use fire extinguishers
- Who to notify after an incident.

Hazard Assessments - Supervisors should regularly check areas such as:

- Vehicle charging racks.
- IT equipment rooms
- Maintenance shops
- Tool rooms
- Offices with multiple chargers

Clear Emergency Procedures - Workers should know:

- Who to call first.
- When to evacuate
- Where fire extinguishers are
- What NOT to do (like handling a smoking battery)

Reporting and Tracking - All overheating, swelling, or smoke events should be reported immediately. This helps uncover patterns and prevent future incidents.

Conclusion

Lithiumion batteries help workers stay productive and connected, but they require safe handling. Fires can happen fast, especially when batteries are damaged or charged incorrectly. By following simple safety steps, reporting hazards early, and participating in training, every employee plays an important role in preventing battery fires and keeping coworkers and facilities safe.

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