



## Lithium-Ion Battery Hazards

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▲ This is the aftermath of a fire started by lithium-ion batteries. Image courtesy of the New York City Fire Dept.

Industrial use of lithium-ion batteries has been increasing over the past decade due to their long life, superior power/energy output, low maintenance, and low weight. These benefits increase efficiency and reduce costs. However, additional hazards need to be identified, understood, and considered when changing and approving the devices used in classified areas.

This Beacon provides some lessons learned from incidents with lithium-ion batteries and recommendations to better understand and prevent lithium-ion battery fires and explosions.

Refer to the July 2023 Beacon for a review of battery-powered devices as ignition sources and guidance on their proper use in hazardous areas ([www.aiche.org/ccps/resources/process-safety-beacon/archives](http://www.aiche.org/ccps/resources/process-safety-beacon/archives)).

### Did You Know?

- Battery fire incidents are becoming more common because lithium-ion batteries are now in many consumer products, such as laptops, cameras, smartphones, and more.
- Devices have increased hazards during charging. Larger-capacity batteries have a higher fire risk.
- Fires involving lithium-ion batteries are fast, intense, and difficult to contain or extinguish. The batteries can produce hazardous fumes and gases and even explode. After extinguishing, quarantine and monitoring are necessary since the batteries can re-ignite.
- Faulty manufacturing, damage, misuse, and aging of batteries can also increase the risk of battery fires.
- Advice on safe handling of lithium-ion batteries is available from many sources (e.g., [www.usfa.fema.gov/a-z/lithium-ion-batteries.html](http://www.usfa.fema.gov/a-z/lithium-ion-batteries.html)).
- Emergency response personnel must be trained on the proper extinguishing methods when responding to a lithium-ion battery fire. Underwriters Laboratories (UL) has a webinar on this topic (<https://ul.org/research/electrochemical-safety/battery-safety-science-webinar-series>).

### What Can You Do?

- Buy electronic devices from reputable retailers and use compatible batteries and chargers certified by a reputable agency.
- If a fire occurs, unplug the battery if it can be done safely. Then evacuate the area and call emergency services. Do not try to put the fire out.
- Routinely inspect batteries to make sure there is no cracking, bulging, or leaking.
- Charging lithium-ion batteries creates heat. Be sure to charge on a solid surface and in a safe area with good ventilation. When charging a lithium-ion powered device, monitor the charging. Once a battery is fully charged, unplug it.
- Never throw lithium-ion batteries in the general trash — they require special disposal. Consult local waste disposal services for proper handling.
- If you use battery-powered vehicles in your plant, only park them in approved areas, never near flammable materials.

**Do not let lithium-ion batteries power a fire!**