



Weekly Safety Meeting

Safety with Lithium-ion Batteries

If you have flown on a plane lately, you know that TSA asks you if you have any lithium-ion batteries in your checked baggage. You are only allowed two personal use lithium-ion batteries, but that is in your carry-on luggage. There is a good reason for this.

Lithium-ion batteries contain one or multiple lithium cells connected electrically. When the battery is charged, these cells are electrically connected in an electrolyte solution. This solution is a combination of solvents with an electrolyte salt. Some of these electrolytes are flammable liquids. These types of batteries are efficient, but also less stable than single-cell batteries because they convert chemical potential energy into electrical energy through use of lithium ions or metal. They can overheat, causing **thermal runaway**, which can lead to smoke, an explosion, or a fire.

Thermal Runaway

Thermal runaway is a chain reaction of damaged cells in a battery and can be caused by a short circuit due to a manufacturing defect, mechanical damage, exposure to extreme heat/cold, or overcharging. Thermal runaway has telltale signs such as an increase in battery temperature, off gassing (venting of gas, vapor, or smoke), or a fire. Fires caused by thermal runaway can produce chemical hazards that may include hydrogen fluoride (HF), hydrogen chloride (HCl), hydrogen cyanide (HCN), phosphoryl fluoride (POF₃), carbon monoxide (CO), carbon dioxide (CO₂), and black carbon.

Items that use Lithium-ion Batteries

Many electronic devices use lithium-ion batteries. These include laptops, cellphones, tablets, cameras, and even power tools. Popular micro-mobility devices such as hover boards, E-scooters and E-bikes have become increasingly popular and have this type of battery, as well as electric vehicles. The same rules apply for safety using larger lithium-ion batteries, but on a larger scale called a large Energy Storage System (ESS). Also increasing with the popularity of electronic mobility devices are the number of fires in garages and homes.

Here are some “Do”s and “Don’t”s when it comes to lithium-ion batteries:

DO

- Take batteries to be recycled at a designated recycling center.
- Use a battery storage tray to store unused batteries or keep batteries separated.
- Charge batteries at room temperature.

- Use the charging cable that came with the device or a quality replacement part from the manufacturer.
- Charge batteries in a well-ventilated space.
- Make sure products comply with UL fire safety standards.
- Have repairs to damaged devices done by a qualified professional.

DON'T

- Put lithium-ion batteries in the trash.
- Pile up batteries.
- Store batteries near sources of heat or flame.
- Overcharge batteries or keep them plugged in overnight.
- Charge multiple devices at once.
- Keep extension cords plugged in for over 30 days.

BE AWARE...LITHIUM-ION BATTERIES CAN START FIRES!

Safety Meeting Sign-In Sheet

Supervisor:	Subject:
Location:	Date:
Conducted By:	Trainer Signature:

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