



Township of Lower Makefield
OFFICE OF THE FIRE SERVICE DIRECTOR
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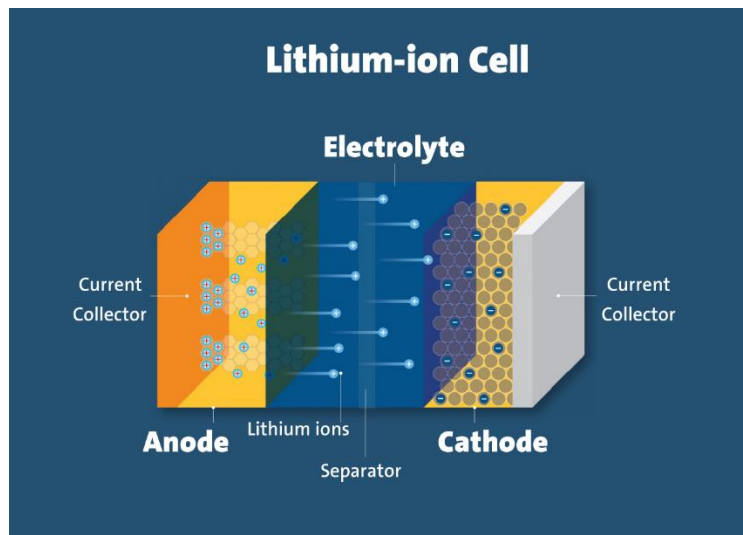
Lithium-Ion Battery Safety



The use of lithium batteries has seen a massive increase over the last five years; it seems that every electronic device now uses this type of battery. The lithium-ion battery can pack a bigger punch in a smaller package, making it appealing to manufacturers who are trying to concentrate power into smaller packaging. Due to this increased use, we have seen an uptick in fires and injuries from lithium batteries.

What is a lithium battery?

A lithium battery is a type of battery that can store much more energy than an ordinary alkaline battery. The lithium battery consists of several cells, each of which consists of a kind of sandwich of materials. The advantage of its extremely high energy density is that a relatively small battery can provide a device with energy for a long time. Compared to alkaline batteries, lithium batteries last on average 7 times longer.





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The difference between lithium and li ion

There are two types of lithium battery: the non-rechargeable lithium battery and the rechargeable lithium-ion battery (also called li ion). Nowadays a lithium-ion battery is used in almost every rechargeable device. Smartphones, laptops, electric toothbrushes. All these devices are equipped with the popular rechargeable Li-ion battery. Even electric cars, ships and e-bikes are equipped with lithium-ion batteries.

Why do Lithium Batteries Catch Fire?

Most fires that occur from lithium batteries are due to thermal runaway. A thermal runaway happens when conditions are met that cause reactions to occur and cannot be easily stopped. These reactions are exothermic, meaning that they give off heat, and that heat may be enough to cause a fire.



We know that physical damage or electrical abuse, such as short circuits, overcharging, and exposure to elevated temperatures, can cause a thermal runaway. Additionally, manufacturer defects, such as imperfections and/or contaminants in the manufacturing process, can also lead to thermal runaway.

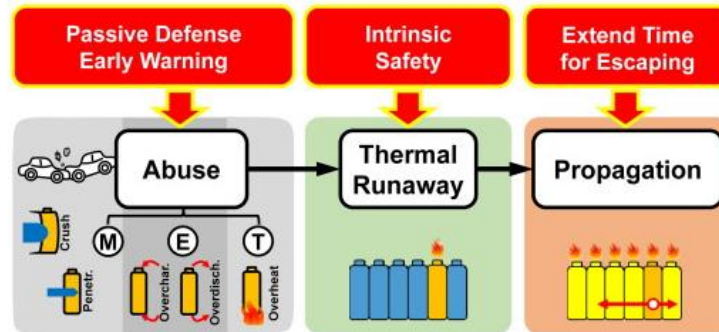
Thermal Runaway in Lithium Batteries

During thermal runaway of a battery, a reaction can occur, which vaporizes the organic electrolyte and pressurizes the cell casing. If, or when, the case fails, the flammable and toxic gases within the cell are released. Once a thermal runaway starts, the process cannot be stopped, even by unplugging the battery. Even worse, you may not know when this runaway starts. Therefore, it is best to make sure that the battery is being charged in a safe place where other fuels will not be ignited.

To minimize the possibility of thermal runaway the battery, charger, and device manufacturers use battery management systems to make sure that the batteries are operated within a voltage, current, and temperature range that is considered safe. For example, if a lithium-ion powered device says the battery is dead and the device will not operate, the actual battery is not dead, instead, it has reached the lower level of safe operation and a good management system will not allow the use of the device.



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Safety Tips

- Purchase and use devices that are listed by a qualified testing laboratory.
- Always follow the manufacturer's instructions.
- Only use the battery that is designed for the device.
- Put batteries in the device the right way.
- Only use the charging cord that came with the device.
- Do not charge a device under your pillow, on your bed or on a couch.
- Keep batteries at room temperature.
- Do not place batteries in direct sunlight or keep them in hot vehicles.
- Store batteries away from anything that can catch fire.
- Storage of lithium-ion batteries in a fire-resistant safety cabinet is suggested

Stop using the battery if you notice these problems:

- Odor
- Change in color
- Hot to touch
- Change in shape
- Leaking
- Odd noises.
- If it is safe to do so, move the device away from anything that can catch fire. Call 9-1-1.

Battery Disposal

Do not put lithium-ion batteries in the trash. Recycling is always the best option. Take them to a battery recycling location or check with the township for when a recycling day is scheduled in the area. Do not put discarded batteries in piles.