

# Lithium-Ion Batteries

Lithium-Ion batteries are the most commonly found re-chargeable battery due to their high-density and light weight. They can store more energy than other battery designs, making them ideal for a wide array of applications. Li-ion batteries can be found in hand-held power tools, children’s toys, e-mobility vehicles such as scooters and e-bikes, small and large appliances, and electric vehicles.

Li-ion battery use only continues to grow, partly driven by their usefulness in electric vehicle applications. It is estimated that the global market for electric vehicles will reach \$25 billion by 2025 and that batteries used in electric vehicles will have similar lifecycles (e.g., 10+ years).

While li-ion batteries grow in popularity, they present unique safety risks and could cause injury if they have design defects, are made of low-quality materials, are assembled incorrectly, are used or recharged improperly, or are damaged.

Li-ion batteries can suffer from thermal runaway, which is when a cell within the battery overheats, the heat from this one cell causes surrounding cells to overheat, which then cause further surrounding cells to overheat. The University of Washington describes the severity of thermal runaway as ranging from thick smoke to a road flare, to a steady burn, to a fireball, to an explosion with cell construction and whether the cells are vented to release pressure being a contributing factor.

Hazardous products produced during thermal runaway include flammable by-products, toxic gases and flying debris, and typically includes prolonged burning of the electrolyte and casing material.



**OSHA recommends “using batteries, chargers, and associated equipment that are tested in accordance with an appropriate test standard (e.g., UL 2054) and, where applicable, certified by a Nationally Recognized Testing Laboratory (NRTL).”**

When using li-ion batteries, consumers should avoid over charging batteries, using excessive or inappropriate currents for charging, causing physical damage to the batteries, or subjecting them to extreme cold or heat.

And when batteries reach their end-of-life, if stored unsafely, discarded in the trash, or comingled with non-lithium-ion batteries, they can result in fires and explosions. The EPA recommends that li-ion batteries be recycled at certified battery electronic recyclers.