



The University of Vermont

CAMPUS SAFETY ADVISORY

SAFE USE, STORAGE, AND DISPOSAL OF LITHIUM-ION (LI-ION) BATTERIES & EQUIPMENT

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Background

Lithium-Ion (Li-Ion) and Lithium-Polymer (LiPo) batteries are commonly used to provide power to many different types of portable equipment. This type of battery has been linked to serious fires over the last year as either a primary source of fire ignition due to battery failure or as a secondary fuel that is exposed to a nearby fire. The purpose of this university-wide advisory is to provide information and resources to the UVM community to prevent losses and injuries involving Li-Ion batteries.

Certain personal devices use Li-Ion or LiPo batteries for power; these include, but are not limited to: hoverboards, E-scooters, and E-bikes. These devices are prohibited from being stored, charged, or used in UVM residential buildings under the [UVM Residential Life Housing Contract](#). Also refer to the [UVM Fire Safety Policy](#) for additional fire safety requirements in UVM buildings.

Hazards

Damaged or unstable batteries and improper charging, storage, or disposal can cause Li-Ion and LiPo batteries to overheat, potentially leading to an explosive and/or aggressive fire that can spread rapidly or re-ignite. This type of fire can be challenging to extinguish.

Thermal Runaway: A rapid self-heating of a battery from a chemical reaction that can result in a chain reaction of failures within adjacent battery cells. Thermal runaway can result from physical damage to a battery, electrical short-circuits and overcharging, corrosion caused by exposure to slush and salt in the winter season, or exposure to elevated temperatures.

Best Safety Practices

- **General**
 - ALWAYS purchase and use batteries and devices that are listed or approved by a Nationally Recognized Testing Laboratory, such as Underwriter's Laboratories (UL) or Intertek (ETL).
 - ALWAYS read and follow the manufacturer's instructions for charging, use, maintenance, and storage.
 - ALWAYS use the correct battery and charger size and type that is specified for the device.
 - ALWAYS download a copy of the Safety Data Sheet (SDS) for the battery on the manufacturer's website or by contacting the manufacturer. Review and understand the hazards of the battery before storing, charging, or using.
 - ALWAYS locate exits and evacuation routes in your area. Know the location of portable fire extinguishers in the area, and the location of the nearest fire alarm pull station (if the building is equipped with a fire alarm system).

- **Storage**

- ALWAYS store batteries and devices at room temperature.
- ALWAYS store batteries away from any materials that can catch fire.
- ALWAYS store batteries away from heat sources.
- ALWAYS visually inspect stored Li-Ion and LiPo batteries, at a minimum, weekly.
- ALWAYS identify and separate one-time-use batteries from rechargeable batteries.
- AVOID storing Li-ion batteries with metal objects, including in a drawer with coins.
- AVOID storing bulk quantities of Li-Ion or LiPo batteries. Contact safety@uvm.edu if you must store large quantities of Li-ion or LiPo batteries.

- **Charging**

- ALWAYS use the charging cord supplied with the device (or only use a replacement charging cord that is specified by the device manufacturer to be an approved alternative).
- ALWAYS immediately disconnect the charging cord from the wall outlet if batteries or equipment develop heat/smoke, unusual odors, or show evidence of bulging (changes in shape or geometry).
- ALWAYS consider using a “Lipo Guard” or a similar protective pouch while charging Li-Ion and LiPo batteries (this type of pouch will contain a small fire should the battery bulge or experience a thermal runaway event, protecting nearby items against ignition.
Note: this recommendation is not intended to apply to routine charging and use of personal laptop computers by individuals.)
- NEVER charge a Li-ion or LiPo battery overnight and unattended.
- NEVER attempt to charge a one-time-use (non-rechargeable) Li-Ion or LiPo battery.
- NEVER charge a device under a pillow, on a bed, on a carpet, on a couch, or other combustible material.
- NEVER continue to charge a device or a battery after it is fully charged, unless the manufacturer’s instructions for the charger and the battery specifically state that it is allowed.
- NEVER charge batteries at temperatures below 32°F (0°C) or above 105°F (40°C).
- NEVER use extension cords, power strips, or multi-plugs while charging Li-Ion and LiPo batteries or equipment. Plug the charging cord directly into a wall electrical outlet.
Note: only charge one battery or device at a time per outlet.
- NEVER leave E-bikes or other similar personal mobility devices unattended while charging.

- **Disposal**

- ALWAYS understand and follow [UVM’s procedures for safe battery disposal](#).
- ALWAYS tape over the terminals/contacts of each battery (a fire can start if battery terminals come into contact with each other or other metallic items in the area).
- NEVER put Li-Ion or LiPo batteries in the trash.
- NEVER put discarded batteries in piles.

Emergency Actions

Take the following actions IMMEDIATELY on recognizing that a Li-Ion/LiPo battery or device containing a Li-Ion/LiPo battery is on fire:

- ALWAYS evacuate the room or space and notify others to evacuate.
- NEVER attempt to extinguish this type of fire yourself – portable fire extinguishers have proven to be ineffective in extinguishing Li-Ion and LiPo battery fires.
- ALWAYS close the door to the room or space.
- ALWAYS activate the building fire alarm system and call 9-1-1 to notify the fire department.
- ALWAYS evacuate the building to your unit's designated outside meeting location.
- ALWAYS provide information to the fire department on their arrival: room number or location of the fire and that Li-Ion or LiPo batteries are involved.
- ALWAYS notify UVM Service Operations Support at 802-656-2560 if you have a fire involving a Li-Ion or LiPo battery once you have evacuated to a safe location and notified the fire department.

Resources

- [NFPA Lithium-Ion Battery Safety Tip Sheet](#)
- [NFPA Safety with E-Bikes and E-Scooters Web Page and Tip Sheet](#)
- [UVM Environmental Health & Safety: Battery Safety](#)
- [UVM Recycling & Zero Waste Program: E-waste, Batteries, and Bulbs](#)
- [Fire Department of New York \(FDNY\): Lithium-Ion Battery Safety](#)
- [University of Washington Environmental Health & Safety: Lithium Battery Safety informational paper](#)
- [Consumer Products Safety Commission \(CPSC\) Recalls](#)