



# High Energy Battery Safety:

## A Guide for Retailers

As the nation's leading battery recycling program, The Battery Network puts safety first. This guide is designed to help industry stakeholders understand and enact best practices for maintaining a safe work environment – keeping employees and customers safe while handling high energy batteries.

### Key Definitions & Standards

For the purposes of this document, a “high energy battery” is defined as a lithium-ion battery that is **greater than 300 watt-hours (Wh) and less than 2,000 Wh**. The Battery Network references multiple resources\* to help guide safe battery practices.

- Batteries that have been rebuilt or re-manufactured and have not been subject to the UN 38.3 test standards are likely considered prototypes by the US DOT and require specific handling as listed in 49 CFR § 173.185(e).

### Safely Charging High Energy Batteries

**Follow manufacturer's instructions:** High energy batteries should be charged in accordance with the manufacturer's instructions. (FDNY2022)

**Charge with adequate electrical supply:** High energy batteries should have adequate electrical supply and a sufficient number of electrical receptacles to allow the charging equipment for each item of equipment or device to be directly connected to a receptacle. (FDNY2022 and IFC 2024)

**Charging high energy batteries should be directly connected to a receptacle:** Extension cords and power strips shall not be used. (FDNY2022 and IFC 2024)

**Charging areas:** High energy batteries, battery packs, and other removable storage batteries

shall not be stacked or charged in an enclosed cabinet (unless the cabinet is specially designed and approved by the department for such purpose). (FDNY 2022 and IFC 2024)

**Charging surroundings:** Storage of combustible materials, combustible waste, or hazardous materials shall not be permitted in the charging area. (IFC2024)

**Keep exits clear:** The charging operation shall not be conducted in, or obstruct, any required means of egress. (IFC2024)

**Fire detection:** The indoor charging room or area shall be protected by a fire alarm system utilizing air-aspirating smoke detectors or radiant energy-sensing fire detection. (IFC2024)



**Use proper charging equipment:** Only listed devices utilizing listed charging equipment shall be permitted to be charged. (IFC2024)

**Maintain proper charging distances:** A minimum distance of 18 inches (457.2 mm) shall be maintained between each removable storage battery during charging operations

unless each battery is isolated from neighboring batteries by an approved fire resistant material.(IFC2024).

Note that the 2022 NYC Fire code (Local Law No. 47 of 2022) requires that a minimum of 3 feet (914 mm) shall be maintained.

## Safely Storing High Energy Batteries

Limit how many batteries are stored together: Not more than 15 cubic feet (0.42 m<sup>3</sup>) of lithium-ion or lithium metal batteries shall be permitted to be stored in containers in accordance with the following (IFC2024):

- Containers shall be open-top and constructed of noncombustible materials or shall be approved for battery collection. (IFC2024)
- Individual containers and groups of containers shall not exceed a capacity of 7.5 cubic feet. (IFC2024)
- A second container or group of containers shall be separated by not less than 3 feet of open space, or 10 feet of space that contains combustible materials. (IFC2024)
- Containers shall be located not less than 5 feet from exits or exit access doors. (IFC2024)

**Permits may be required:** For sites that store more than 15 cubic feet of lithium-ion batteries. (~165 batteries)

**Store away from entry/exit doors:** Not less than 5 feet (1524 mm) from exits or exit access doors. (IFC 2024)

**Fire safety plan:** Include emergency response actions to be taken upon detection of a fire or possible fire involving lithium-ion or lithium metal battery storage. (IFC 2024)

**Automatic sprinkler system:** Indoor storage areas for lithium-ion and lithium metal batteries shall be provided with an approved automatic fire detection and alarm system complying with Section 907. The fire detection system shall use air-aspirating smoke detection, radiant energy-sensing fire detection, or both. (IFC 2024)

**Ventilation:** Always store high energy batteries in a well-ventilated area. (IFC 2024)

**Reduced charge:** Where feasible, store batteries at a reduced state of charge (not greater than 30% SOC). (IFC 2024)



## In-Shop Safety

**Fire safety plan:** Create a comprehensive fire safety plan for your shop, including planning for emergency procedures. (IFC 2024)

- Meet with your local fire marshal or consult with a professional for assistance in creating an emergency plan.
- Inform the local fire department where high energy batteries are stored. This could help responders in case of a fire near your location.
- Review the fire safety plan with your employees.
- Never attempt to fight a fire that you are not trained to fight.

### Batteries – what you should accept for recycling:

- High energy batteries from participating brands that you feel you can safely inspect and package in the The Battery Network recycling kit.

### Batteries – what you should never allow in your shop:

- Batteries that have been previously modified, rebuilt, or refurbished. (UN 38.3)

- Any battery that is considered a prototype, i.e. not meeting required safety standards. (UN 38.3)
- Any battery involved in an active recall. (contact the manufacturer)
- Any battery you feel is unsafe for any reason.

### What to use and when:

- Please refer to the high energy battery recycling program safety poster when inspecting and packaging batteries for recycling to determine which battery kit to use.

### End-of-life (EOL) kit:

- The EOL kit is provided only for end-of-life batteries from participating brands.
- Damaged-defective (DD) kit:
- The DD kit is provided only for damaged/defective participating branded batteries.
- Signs of a DD battery: Severe physical damage, water damage, burn marks, or signs of a previous thermal event.
- Batteries that are damaged or suspect of being damaged cannot be shipped in the EOL kit

## Transporting High Energy Batteries Safely

**Retailers can transport:** Up to 440 lbs aggregate weight of hazardous materials (including lithium-ion batteries) under the DOT Materials of Trade exceptions if the

batteries are being moved “in direct support of a principal business.”

- Delivering batteries from a retailer to a customer is not covered under the



Materials of Trade exceptions. These would be considered “fully regulated” shipments.

- Delivering batteries from a retailer to a recycling center is not covered under the Materials of Trade exceptions. These would be considered “fully regulated” shipments.
- Shipments of new batteries:
- Can only be made by trained “hazmat employees.” (49 CFR § 172 Subpart H)
- Must be accompanied by hazardous materials shipping papers and signing a Shipper’s Certification indicating that the battery has been shipped in a manner that is consistent with all provision of the Hazardous Materials Regulations. (49 CFR § 172 Subpart C)
- Batteries not shipped in or with equipment must be packaged in Packing Group II (PG2/Y) performance packaging. (49 CFR § 173.185 (b)(3)(ii))

#### **Shipments of end-of-life batteries for disposal and recycling:**

- Must also follow all the requirements above for training, shipping papers and labeling. They do not need to be packed in performance packaging and must only be packed in strong outer packaging. (49 CFR § 173.185 (d))
- Using The Battery Network’s program ship under a DOT Special Permit and do not require that the individuals shipping them be trained as “hazmat employees”. All packaging provided in The Battery Network e-bike recycling kits are compliant with all applicable provisions of the hazardous materials regulations and our Special Permit.

#### **Shipments of damaged, defective, or recalled (DDR) high energy batteries:**

- Must meet stringent packaging requirements. Contact The Battery Network for assistance. (49 CFR § 173.185 (f))

### **For more information:**

connect@batterynetwork.org or call 1-877-723-1297

\* References: FDNY2022 | 2024 International Fire Code | Title 49 Code of Federal Regulations

### **DISCLAIMER**

*This document is provided for general information purposes only and should not be relied upon as providing any advice or guidance to the recipient, whether as to the practices described in the document or the applicable legal requirements and regulations. The Battery Network expressly disclaims any responsibility for liability arising from or related to the use or misuse of any information in this document. For safe charging, storing, recycling, and disposal information for particular high energy batteries, you should follow the manufacturer’s recommended procedures and/or contact the manufacturer for more information. For guidance related to the legal requirements and regulations applicable to high energy batteries, you should consult with an outside legal professional to ensure compliance with all such requirements and regulations.*

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