

E-Bike Battery Safety Considerations for Retailers

As the country's leading consumer battery recycling program, Call2Recycle® keeps safety at the center of everything we do. This document is designed to help e-bike industry stakeholders understand and enact best practices to maintain a safe work environment and keep both employees and customers safe.

Summary

For the purposes of this document, an “e-bike battery” is defined as a lithium-ion battery that is *greater than 300 watt-hours (Wh)*. Call2Recycle references multiple resources* to help guide safe battery practices.

- Only use e-bikes that are equipped with systems that have been tested to the ANSI/CAN/UL 2849 Standard for Safety Electrical Systems for e-bikes, and/or other applicable international safety standards for electric bicycles, lithium ion batteries and power supplies. Ask suppliers to provide you proof of that testing and certification, and that it was performed by an approved testing laboratory.
- The UL 2849 Standard for Safety Electrical Systems for e-bikes has been developed to provide fire safety certification by examining the electrical drive train system, battery system, and charger system combinations of e-bikes.
- 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).

Charging E-Bike Batteries

Follow manufacturer's instructions: E-bike batteries should be charged in accordance with the manufacturer's instructions. (FDNY2022)

Charge with adequate electrical supply: Charging e-bike 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 e-bike batteries should be directly connected to a receptacle: Extension cords and power strips shall not be used. (FDNY2022 and IFC 2024)

Charging areas: E-bike 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.

Storing E-Bike Batteries

Limit how many batteries are stored together: Not more than 15 cubic feet (0.42 m³) 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 e-bike 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 e-bike 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:

- E-Bike batteries from participating brands that you feel you can safely inspect and package in the Call2Recycle 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 e-bike 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.

Lithium-Ion Battery Incident Kit (LIBIK):

- The LIBIK is provided to bike shops participating in Call2Recycle's e-bike battery recycling program and is intended to augment, not replace, your fire safety plan.
- Attach the LIBIK to the wall near your fire extinguisher for easy access. Review the accompanying instructions provided by the LIBIK manufacturer.
- When it is safe to do so, deploy the LIBIK on a battery showing signs of an approaching thermal event.
- For example: it can be used when a battery is exhibiting signs of an approaching thermal event such as an odor emitting from the battery or is warm to the touch (a potential sign of overheating).
- Never approach a battery that is emitting flames. Immediately evacuate the building and contact emergency services.
- When in doubt, evacuate the building and call 911.

Transporting E-Bike Batteries

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 Call2Recycle’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 Call2Recycle 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) e-bike batteries:

- Must meet stringent packaging requirements. Contact Call2Recycle for assistance. (49 CFR § 173.185 (f))

For more information:

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* References: [FDNY2022](#) | [2024 International Fire Code](#) | [Title 49 Code of Federal Regulations](#)

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