Lithium-Ion Battery Safety

2023: 268 Fires / 18 Deaths / 150 Injuries

Lithium-Ion Battery Safety

Lithium-Ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones and many other common household devices.

Lithium-Ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging and disposal of these types of batteries.

Safety tips include immediately stopping the use and charging of batteries and calling 911 if you notice:

(1) Fire or smoke (2) Overheating (3) Change in color or shape

(4) Odd noises (5) Leaking (6) Strange smell

In the event of a fire, leave and close the door. Call 911 once you are in a safe location.

Water may not prevent a battery fire from burning and spreading. Battery cells are known to explode and quickly spread to another battery, and may spread to other devices.

Lithium-Ion batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-Ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosions.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level, fire may reignite on the battery and surrounding area.

Safe Lithium-Ion Battery Charging and Storage / 2022 Fire Code Section 309.3

For five (5) or fewer personal mobility devices, such as e-bikes and e-scooters, charge the personal mobility devices or their batteries in a safe location and away from exits and hallways and plug directly into a wall outlet.

Do not stack batteries. Maintain a separation distance between devices or batteries that are charging in a single fire area. 20 kilowatt-hours (kWh) require at least a 2-foot separation. 50 kWh require at least a 3-foot separation.

Examples of the most common battery sizes:

Battery Capacity	Kilowatt-Hours (KWH)	Number of Batteries Allowed Capacity 20-50 KWH
48V 22AH	1.056 up to 19	Up to 47
48V 15AH	0.72 up to 27	Up to 69

36V 10.4AH	0.3744 up to 33	Up to 113

If there is a fire involving batteries:

Close the door Leave the building immediately Call 911 from outdoors Do not extinguish a battery fire

Use the original charging equipment or manufacturer-recommended/listed, certified replacement equipment.

For charging plug the devices or batteries directly into wall outlets	Do not use extension cords or power strips to charge lithium-ion batteries.	Make sure you have a working smoke and carbon monoxide detectors or alarms inside and outside the charging area.
Remove all combustible items from charging areas. Items such as storage, rubbish, etc. must not be kept in the charging area.	For more than five (5) personal mobility devices, charge the devices or their removable batteries in a dedicated room with ventilation and a self-closing door.	

Why using a manufacturer's battery improves safety:

Many mobility products have been approved by testing laboratories such as Underwriters Laboratories (UL). These products are expected to operate safely during normal use. The parts are tested for electric shock and fire safety before receiving any approval (listed).

By buying the exact battery and using the exact charger specified by the e-mobility product manufacturer, there is less risk of fire caused by defective, mismatched or unknown equipment.

Charging more than five (5) batteries:

Store in a separate, one-hour, fire rated and sprinklered room, a 2x4 wall construction with 5/8-inch Gypsum panels (sheetrock) for walls and ceiling, as well as a fire rated, self-closing door.

Charging Cabinet Alternative:

There are charging cabinets that are approved by the FDNY Technology Management Unit.

Lithium-Ion Battery Law:

Prohibits the sale of batteries for mobility devices such as electric bicycles and scooters unless such batteries have been listed and labeled by a nationally recognized testing laboratory or other approved organization. A person who violates the local law would be subject to a civil liability.

Battery Replacement:

Always buy the replacement battery recommended by the manufacturer. Although it may be more expensive than the generic one, the added cost provides greater safety. Consider the cost of recovering from a fire when choosing a replacement battery.

Safety Tips:

- Chargers must be used with a compatible battery pack.
- Not all batteries are interchangeable. Read labels and instructions carefully.
- If a battery:
    - Is damaged = do not charge
    - Gets hot while charging, immediately stop using and properly dispose.
    - Starts to expand or emit smoke, leave immediately and call 911.
- If a replacement battery does not easily fit in the original battery pack, do not use it.

- Before buying or using a generic battery, check with the manufacturer or retailer of the personal mobility device, an authorized repair shop or a testing laboratory such as UL to see if it recommended or listed and safe for use with that device.
- Using unauthorized parts, including batteries and/or chargers, may cause damage and possibly void your warranty.
- Never alter or change battery in any way. This includes opening and adding cells to increase battery capacity. Using a generic charger is dangerous.
- Lithium-Ion batteries do not have to be fully charged. A partial charge is the most suitable.
- Do not throw old batteries in the trash. There are special procedures for the disposal of Lithium-Ion batteries. Visit www.nyc.gov/batteries for locations and information.

ALWAYS	**NEVER**
Purchase and use devices certified by nationally recognized testing laboratories (NRTL)	Use generic batteries or chargers unless it is specifically approved for your product
Use manufacturer's instructions for:	Plug into a power strip or overload an outlet
Charging and storage	Overcharge or leave a battery charging overnight
Using the correct battery, cord and power adapter	Charge a battery or device under your pillow, on your bed or near a couch
Plug directly into a wall outlet	Leave devices unattended while charging
Keep batteries and devices at room temperature and away from anything flammable	Block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
Keep away from heat sources	Place batteries in trash or recycling bin. It is ILLEGAL.

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