

Safe Lithium Ion Battery Storage and Charging Procedures



Read this document before use

Introduction:

Lithium-Ion batteries are everywhere in modern life. Our cell phones, tablets, laptop computers, digital cameras – too many products to list, all powered by these batteries. Lithium-Ion battery chemistry is extremely important in these applications given its high energy density. In other words, Lithium-Ion batteries store an incredible amount of energy in a compact and lightweight package. This enables hours of dependable service between charges.

With the development of high-power lithium-ion batteries, we now have the breakthrough in electrical storage and delivery technologies that make electric vehicles practical for transportation needs.

This utility comes with requirements for safe design, construction, USE, STORAGE and MAINTENANCE. High energy storage always carries the danger that if the energy is released in an uncontrolled fashion, a serious, dangerous situation can develop. Just as tossing a lit match into a bucket of gasoline will generate a dangerous result, so can issues with the use and storage of Lithium-Ion batteries. While Lithium-Ion batteries have proven to be incredibly safe, we must still be aware of potential dangers.

E-Bicycles have become the fastest growing segment of the bicycle market worldwide. E-Trikes are quickly becoming a viable vehicle for personal use, transportation infrastructure and other uses. So enjoy your cycling experience knowing you are part of the E-Trike revolution.

While knowing the chances of a Lithium-Ion fire are miniscule, the ramification of a battery fire can be quite serious and significant. So read and understand the following guidelines.

Battery Storage

- When storing your battery either on the cycle or separately, store in a place that is not near any flammable items (wooden shelves, too close to a wall, etc).
- Try to store battery in a temperature controlled climate.
- Have a fire extinguisher in the vicinity of the stored battery. While the fire extinguisher will not put out battery fires, it will allow you to protect the areas surrounding the battery in case of a battery discharge failure.
- It is wise to have a trash can filled with paper near the storage area (see In case of emergency section) for details

- If a battery is damaged in any way, it is far more likely to cause issues, so do your best not to dent the battery pack and handle with care.

Battery Charging

- Only charge the battery using the charger supplied by the manufacturer that accompanied your battery.
- Never attempt to charge E-Bike batteries with generic chargers, power supplies or other charging device.
- **Always monitor the battery while it is being charged!** When the indication comes on showing the battery is fully charged, disconnect the charger from its power source and unplug the battery from the charger. And safely store the battery at that point. **DO NOT CHARGE BATTERIES UNATTENDED OVERNIGHT.** Think of it as the equivalent of cooking on a stove. It should be monitored at all times during the charging process.
- **NEVER EVER Open a lithium-ion battery pack** as there are no serviceable parts contained therein.

In Case of Emergency

- If a battery pack starts smoking, emitting unusual noises or showing signs of melted plastic:
 - If possible place the failing pack into a water filled trash can.
 - And if safe to do so, move the pack to an open outdoor area and away from flammable materials.
 - If however, you are unable to contain the situation, it is wise to **call 911**

Notes of Lithium-Ion Battery Fires

- It is not possible to extinguish a Lithium-Ion battery fire whether for your cell phone or an E Bike. This is why it is important to monitor the battery when charging or when fully discharged, which are the most frequent times when a potential issue might (rarely if ever) occur.
- A battery fire usually starts with a single cell. As the cell achieves what is referred to as thermal runaway, it will combust forming a thick, toxic smoke and extreme heat. The heat from the failing cell causes adjacent cells to ~~£Cook Off~~+which becomes extremely dangerous. That is the reason to have a water filled trashcan in the vicinity so the battery can be submerged to mitigate the chances of the other cells involvement.
- The final remedy for a battery pack fire is to let it safely burn itself out away from any flammable items, our doors.

As originally noted, these battery incidents are incredibly rare, but preparation for such events, and proper storage and charging methods are key.

Disclaimer:

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