

# How to Store Lithium-ion Batteries Safely When Not in Use

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Lithium-ion batteries have many advantages, including high voltage, large compacity, high energy density, and long lifespan, to name just a few. These are popular batteries for smartphones, electric cars, and home energy storage systems.

Despite the benefits of lithium-ion batteries I mentioned above, you should be aware that Lithium-ion batteries sometime could be dangerous because they can overheat, catch fire, or explode. Thus, it's necessary to get better knowledge about the different types of lithium-ion batteries, what they are made of, how they work, and most importantly, understanding the best way to store lithium-ion batteries when not in use, to minimize the risk of lithium battery fire or explosion.

In this guide, I'll explain everything you need to know about storing lithium-ion batteries, for example: Where is the best place to store a lithium-ion battery?? Is it better to store lithium batteries charged or uncharged?? At what temperature should a lithium-ion battery be stored?

The ideal temperature for storing the lithium battery is between 5 °C and 20 °C (41 °F and 68 °F). To be more specific, you can check the labels of your battery type and set the proper temperature before storing them. And there's one thing to remember, Li-ion battery degradation is mainly caused by chemical exothermic reactions, and the high temperature will accelerate the degradation of lithium-ion batteries. So, keep your lithium battery at low or room temperature to slow down the decomposition process of the battery.

For best results, keep the lithium-ion batteries at a relative humidity of about 50%. If the lithium or lithium-ion battery is exposed to a high-moisture environments, it will lead to the reduced performance and reduced lifespan of lithium-ion batteries. If possible, refrigerate the battery in a dry environment to extend the battery life.

When not using your lithium-ion batteries, store them at around 40% -50% state of charge (SoC). And keep in mind that lithium-ion batteries should never be stored fully charged or completely discharged. On the one hand, lithium-ion batteries will gradually self-discharge, and they will lose large amounts of their usable life if they're fully charged all the time. On the other hand, storing lithium-ion batteries fully discharged will be harmful to the battery cell.

In the previous paragraphs, you've learned the three main factors that impact the battery's health, which are temperature, state of charge, and humidity. The following parts are the general guidelines for you to properly store your lithium-ion batteries and maximize the lifetime of your lithium-ion battery.

1. Remove the battery from the device before storing it.
2. Use plastic, electrical tape, or other insulating

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materials to protect the battery terminal.3. Keep the battery in a fireproof container.4. Remove flammable, combustible materials, and liquids from the storing area.5. Handle lithium-ion batteries with caution and wash hands after handling them.6. Cover the discarded batteries with insulating paper to prevent explosion and fire.

1. Do not use damaged, swollen lithium-ion batteries.2. Do not expose the Li-ion batteries to excessive vibration.3. Do not store batteries in high or low temperatures.4. Do not place the Li-ion batteries in the microwave or high-voltage environment.5. Do not charge the lithium battery with inferior or other battery chargers.6. Do not put the lithium battery in water.

Yes. All batteries, including lithium-ion batteries and other types of batteries, will degrade over time even if you don't use them. It is reported that a fully charged lithium-ion battery will reduce 20% of its capacity after a year of storage.

Lithium-ion batteries are famous for their poor cold-weather performance. If you store the battery at freezing temperatures, it will do harm to the battery cathode, making it separate from other parts of the battery. During winter, I recommend storing lithium-ion batteries at 50% state of charge in an environment above freezing.

The ideal place for storing batteries should be away from sunlight, heat, and humidity. You can find a cool, temperature-controlled, and dry location to store your lithium-ion batteries. Places like refrigerators, garages, basements, and bathrooms are not recommended for battery storage.

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