

18650 Lithium-Ion Battery Maintenance Guide



LITHIUM-ION BATTERIES ARE COMBUSTIBLE. READ THIS MANUAL FOR PROPER MAINTENANCE, CARE AND DISPOSAL.

Although uncommon, Lithium-Ion batteries can be combustible, or will leak fluids when not properly maintained, charged and/or stored. All Lithium-Ion Rechargeable Batteries require routine maintenance and care in their use and handling. Read and follow the guidelines to safely use Lithium-Ion batteries and maximize your battery's life span.

Overview

DO NOT leave batteries unused for extended periods of time, either in the product or in storage. When a battery has been unused for 6 months, check the charge status and charge or dispose of the battery as appropriate.

The typical estimated life of a Lithium-Ion battery is about two(2) to three(3) years, or 300 to 500 charge cycles; whichever occurs first. One charge cycle is a period of use from fully charged, to fully discharged, and fully recharged again. Use a two to three-year life expectancy for batteries that do not run through complete charge cycles.

Rechargeable Lithium-Ion batteries have a limited life and will gradually lose their capacity to hold a charge. This loss of capacity (aging) is irreversible. As the battery loses

capacity, the length of time it will power the product (run time) decreases.

Lithium-Ion batteries continue to slowly discharge (self-discharge) when not in use or while in storage. Routinely check the battery's charge status. The product user manual typically includes information on how to check battery status, as well as battery charging instructions.

Use Lone Survivalist approved batteries and chargers with Lone Survivalist products. Lone Survivalist is not responsible or liable for any batteries or chargers that cause bodily harm and/or damage to property, battery or flashlight, and could void the product's warranty.

If using other brand batteries, be sure to ONLY use batteries that meet the requirements of the Lone Survivalist flashlight model (s) as specified in the product manual. Please read every product guide and instruction manual before operating any rechargeable, battery-powered equipment.

Battery Maintenance

Observe and note the run time that a new, fully-charged battery provides for powering your flashlight. Use this new battery run time as a baseline to compare run times for older batteries you may have purchased. The run time of your battery will vary depending on the operating power of the product and the applications under which it will be run.

- Routinely check the battery's charge status.

- Carefully monitor batteries that are approaching the end of their estimated life.
- Consider replacing the battery with a new one if you note either of the following conditions:
 1. The battery run time drops below about 80% of the original run time.
 2. The battery charge time increases significantly.
- If a battery is stored or otherwise unused for an extended period, be sure to follow the storage instructions in this document. **If you do not follow the instructions, and the battery has no charge remaining when you check it, consider it to be damaged. Do not attempt to recharge it or use it. Replace it with a new battery.**

Charging

Always follow the charging instructions provided with your product. Refer to your product user manual and/or online help for detailed information about charging its battery.

Here are some precautions to take:

- Do not charge or continue to charge batteries after they have reached full capacity.
- Never allow batteries to come in direct contact with metal objects or fluids.

NOTE. When you troubleshoot battery issues for dual battery configurations, test one battery and one battery slot at a time. A defective battery can prevent the battery in the opposite slot from charging, leaving you with two uncharged batteries.

Storage

- Charge or discharge the battery to approximately 50% of capacity before storage.
- Charge the battery to approximately 50% of capacity at least once every six months.
- Remove the battery and store it separately from the product.
- Store the battery at temperatures between 5°C and 20°C (41°F and 68°F).

NOTE. Lithium-Ion batteries self-discharge during storage. Higher temperatures (above 20°C or 68°F) reduce the battery storage life.

Handling Precautions

- Do not disassemble, crush, or puncture a battery.
- Do not short the external contacts on a battery.
- Do not dispose of a battery in fire or water.
- Do not expose a battery to temperatures above 60°C (140°F).

- Keep the battery away from children.
- Avoid exposing the battery to excessive shock or vibration.
- Do not use a damaged battery.
- If a battery pack has leaking fluids, do not touch any fluids. Immediately dispose of a leaking battery pack (see **Disposal and Recycling** in this manual).
- In case of eye contact with fluid, do not rub eyes. Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the fluid remains. Seek medical attention.

Transportation

Always check all applicable local, national, and international regulations before transporting a Lithium-Ion battery.

Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specifically limited or prohibited.

Disposal and Recycling

Lithium-Ion batteries are subject to disposal and recycling regulations that vary by country and region. Always check and follow your applicable regulations before disposing of any battery. Go to <http://www.call2recycle.org/locator/> to find a battery recycling drop-off center near you.

Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles.

Place only discharged batteries in a battery collection container. Use electrical tape or other approved covering over the battery connection points to prevent short circuits.

Resources

Information about rechargeable battery waste:

<http://www.call2recycle.org/consumers/>

Battery Recycling Drop-off Locator:

<http://www.call2recycle.org/locator/>

Battery safety tips:

<http://www.call2recycle.org/consumer-safety-tips/>

Battery usage tips:

<http://www.batteryuniversity.com/>

