



Guide to Lithium Battery Care

Modern BMS protected lithium batteries have wonderfully long lifespans, high reliability and require much less babying than earlier rechargeable battery types. Nevertheless there are a few things to know.

Two Critical Rules

Avoid Storage Death!

Fatal overdischarge in storage occurs because your battery will slowly lose its charge just sitting on the shelf. Lithium batteries are less forgiving of overdischarge than other chemistries and must not fall below 2.5v per cell.

To reduce this risk, make sure your battery is at least 50% charged before storage, and physically unplug the battery from any loads that could increase the drain. It should last 6-12 months before requiring a top-up. If the battery is left plugged into an ebike that is left on, it will go flat in a matter of weeks and may become irrecoverably damaged a few weeks after that.

Don't Charge While Cold!

Ideally charge your battery at room temperature. If it is below 5C (40 F) it should be charged as slowly as possible to prevent harm. Charging below freezing can be extremely risky.

It is fine to discharge the battery as low as -20C (-4F) but the performance will noticeably reduced. In cold climates it's best to have the battery stored indoors and warm until you need to use it.

Tips for a Healthy Battery Life

Oversize Your Pack

Getting the smallest battery that meets your needs is often a false economy. A smaller battery will lose capacity more quickly than a larger, given the same use case. As capacity fades a larger battery will remain useful for longer. Lower C-rates, partial charging, and shallow cycling are all benefits of an oversized battery.

Charge Slow

Fast charging is convenient, but often unnecessary. Save your fast 8A Satiator profile for pressing needs, and use a slower 2-4A profile for overnight charging. Maximum charge currents incur greater wear than maximum discharge currents

Partial Charge

Charging to 4.2V per cell (100%) maximizes distance per charge, but charging to lower voltages (4.0V-4.1V, 80-90%) can give you substantially more total cycle life. Don't be afraid to start a ride partially charged if you don't need the full range.

If you have a Satiator charger, set your primary overnight charge to the 85% profile, and save the 100% for when you need it.

Parallel not Sequential

However much battery you can afford to carry with you, use it all simultaneously. Using two batteries in parallel enables lower discharge currents and shallower cycling. It is more sensible than exhausting one battery before connecting another

Final Caution

Be aware that even properly cared for lithium batteries have been known to catch fire unexpectedly, especially while charging. This is exceedingly rare with brand name cylindrical cells as used in packs from Grin, but it is always a finite possibility. As much as possible don't leave the battery charging unattended in an area where a fire would cause significant harm. And be careful around lithium batteries that have suffered mechanical impact damage as those can cause shorts internal and external to the cells.

