



Lithium-Ion Polymer (Lithium Polymer, or LiPo) Batteries

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IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS

Lithium-Ion Polymer batteries are volatile. Read these safety instructions and warnings before using or charging your batteries. Failure to do so may result in fire, personal injury, and damage to property.

General Guidelines and Warnings

- LiPo battery charge and discharge rates are given as a multiplier of the capacity. For example, a 3300 mAh (miliAmp-hour) battery with a 20C rating, the maximum continuous discharge rate is:

$$20C \times 3300 \text{ mAh} \times \frac{1 \text{ Ah}}{1000 \text{ mAh}} = 66 \text{ A}$$

- Store and charge in a fireproof container; never in your model!
- Never short a LiPo Battery by cutting both wire leads simultaneously, contact with a conductive object, or any other means. If you accidentally short the wires, the battery must be placed in a safe area for observation as described above.
- In the event of damage (from a crash, etc), or swelling (ballooning): immediately cease use of the battery and observe it in a safe place for at least 30 minutes. Continuing to use a battery that has *any* physical damage, or has begun to swell may result in fire, injury, or damage.
- We recommend 3-5C max average discharge rate for breaking in new packs. Also be extremely careful not to over-discharge new packs (Packs should NEVER be over-discharged at any time, but over-discharging on the first flight will result in permanent damage to the battery).
- Never store or charge a battery pack inside a vehicle (especially in extreme temperatures).
- Store battery at room temperature between 40 and 80 °F (4 to 27 °C) for best results
- Do not expose battery pack to direct sunlight (heat) for extended periods.

Charging of LiPo Battery Packs

- Let LiPo Battery Pack cool down to ambient temperature before charging. Only charge batteries when the ambient, battery, and charger temperatures are between 32 and 113 °F (0 to 45 °C)
- Before connecting to charger, make a visual inspection of the pack. Look for any damaged leads, connectors, broken shrink, swelling of cells, or other irregularities. Do not use if you find any of the above issues with your pack.
- Do not charge batteries packs in series. Charge each battery pack individually. Failure to do so may result in incorrect battery recognition and charging functions.
- Use specific LiPo Balance Chargers only. Do not use a NiCd or NiMh chargers. Always check that all charger settings have been appropriately set for your specific battery pack.

- Always use balance charging. Do not charge without balancing; this will cause the cell voltages to become unbalanced; which may result in overcharging and damaging cells
- Never charge batteries unattended or overnight. When charging LiPo batteries you should always remain in constant observation to monitor the charging process and react to potential problems that may occur.
- Do not charge LiPo batteries above 4.2 Volts/cell. Overcharged batteries are extremely dangerous.

Discharging (Use) of LiPo Battery Packs

- Do not discharge the batteries at a rate greater than they are rated for.
- Do not discharge batteries more than 80% of their capacity.
- Do not discharge LiPo batteries to below 3 volts per cell. Doing so will decrease the batteries lifespan.
- Discharge only when the battery and ambient temperatures are between 32 and 140 °F (0 to 60 °C).
- As a general guideline, a battery should never become so hot you cannot hold it tightly in your hand.

Battery Disposal

- Batteries that lose 20% of their capacity must be removed from service.
- Before recycling, discharge the battery to 3V/Cell, make sure output wires are insulated, and then wrap the battery in a bag.
- Do not dispose of LiPo batteries in the trash! Take your battery to an approved battery recycling facility. In the US, visit [call2recycle](http://call2recycle.com) for a location near you.