

LIPO Batteries Usage , Assessment of safe to use

Puffy or Swelling Lipo's

All Lipo's will inevitably show some degree of swelling ,Lipo's puff up due to a naturally occurring phenomenon.

Known as ***Electrolyte Decomposition*** when electrolyte decomposes, hydrogen, carbon dioxide, and carbon monoxide are formed as by-products.

These gases are not only responsible for the physical swelling of your Lipos, but two of the three are also highly flammable.

Electrolyte decomposition will occur regardless of how you handle your Lipo's.

How to determine if a battery is safe to use

If you only had your Lipo for a brief period and it swells up exponentially, then you are 'either doing something wrong, or the Lipo could be faulty in which case the battery should be safely disposed of.

On the other hand, if your Lipo has gone through 50+ cycles and starts to show some swelling, this could be considered this to be normal.

Crashed and Damaged Lipo's

A physically damaged Lipo, combined with swelling is a high risk of combusting and should be disposed off and no longer used.

Testing Internal Resistance and cell voltages

One of the best and more accurate ways to determine if your Lil'o is functioning properly or not is to check the internal resistance (<1R). IR ultimately dictates how efficient your battery is, A low IR implies greater efficiency while a high IR means the opposite.

Just like electrolyte decomposition, IR will gradually increase over time; however, proper usage can significantly prolong the process.

A high IR will cause your Lipo's to heat up very quickly while delivering a lower voltage A balance charger or cell checker can detect individual cell voltage balance and internal resistance.

Lipo Specs for a good battery.

Nominal Voltage per cell - 3.7V

Fully discharged per cell- 3.2V (*below this damage will occur*)

Fully charged per cell- 4.2V

Cell balance (within approx, 0.05V)

Cell resistance - below 10 milliohms = OK, Note above 20 milliohms – time to dispose of.

Selection of LIPO Batteries

The current draw in amps of the motor and propeller combination will determine the battery requirement.

Programs such as Hacker Ecalc will predict the performance of a proposed power combination - Motor, prop, ESC, battery.

A Watt meter connected between the battery and ESC should be used to measure the current draw in amps to ensure that it does not exceed the rating of the motor, ESC or Battery.

The maximum discharge current capacity of a battery is dependent on the battery capacity and the C rating for

example a

20C 1000mah battery can be discharged safely at a maximum current of 20amps.

40C 5000mah battery can be discharged safely at a maximum current of 200amps.

Battery Charging

Should only be done using a suitable LIPO balance charger and generally at 1 C charge rate is best for most batteries.

A 1000 mah battery should be charged at 1 amp

A 5000 mah battery should be charged at 5 amps

Safe usage of LIPO Batteries

Check new batteries for physical damage or puffiness.

Check cell voltage and balance of new batteries (refer specs above).

Write a date on new batteries - Batteries that are looked after should last 3 - 5 years with normal use

Charge at 1 C as above unless the battery can safely be charged at a higher rate.

Best not to leave charging LIPO batteries unattended

Over discharge will also damage the Battery and cause it to lose a cell and fail.

Batteries should be stored and discharged to around 3.4V/cell

Store.