

LIPO NUMBERS EXPLAINED

LiPo (lithium polymer) batteries: one of the greatest innovations in the RC universe yet, somewhat confusing. What do the numbers mean on a LiPo? What does the "C" mean? What does the "S" stand for? In this blog, we will decipher the LiPo code together.

Rating System

While the numbers and letters may seem intimidating (especially for beginners), they are actually here to help. Each number or letter is a measurement or rating which enables us to compare and choose the right LiPo battery for the right job. Ultimately, each different number and letter tells you 2 things: how long your RC model will run for before needing a recharge, and how powerful or fast your RC model can get.

Capacity (mAh)

The first thing you should look at is the capacity of the battery which is measured in mAh ([Milliamps Hour](#)). The capacity simply tells you how much power your LiPo battery can hold. For example, a 5000mAh battery can output 5000 milliamps in 1 hour until it is completely drained, If you had an RC plane with a current drain (AKA load) of 20 amps (20,000 milliamps), then you can expect to fly for 15 minutes - $(5000\text{mAh} \div 20,000\text{mAh}) \times 60 \text{ minutes}$ - before completely discharging your battery.

Generally, the higher the capacity, the longer your RC model will run.

Discharge Rate (C)

The C Rating is a safety gauge that tells you the maximum current - measured in amps - you can draw without damaging your LiPo battery. The C Rating by itself may be a little misleading as you also need to know the capacity (mAh) to calculate the maximum current draw. The formula is as follows:

$$\text{Max Current Draw} = \text{Capacity} \times \text{C Rating}$$

So, if you had a 2S LiPo with a capacity of 5000mAh and a C Rating of 50, the maximum current draw would be $5000\text{mAh} (5\text{A}) \times 50\text{C} = 250\text{A}$. You can theoretically go over the recommended draw, however, this will overheat your LiPo battery and ultimately, damage it.

The C Rating can also be used to determine how quickly you charge your LiPo batteries. A seasoned hobbyist may tell you to "charge your LiPo at 2C". This means to charge your battery

at a current of the capacity in amps (A) x 2C. So, if you had the same 2S LiPo with a capacity of 5000mAh, charging your LiPo at 2C means to charge at 10A -- (5A) x 2C.

Cell Count (S)

S stands for series and is used to indicate how many cells are [in series](#) inside the LiPo battery. For example, a 2S LiPo means that there are 2 cells in series within the LiPo battery pack while a 6S LiPo would mean that there are 6 cells. Each cell has a nominal voltage – the average voltage a cell outputs when charged - of 3.7V; so a 2S LiPo has a voltage of 7.4V (3.7V x 2) while a 6S LiPo has a voltage of 22.2V (3.7V x 6).

You can also tell the number of cells in a LiPo battery by counting the number of wires in the balance connector. If the balance connector has 3 wires, it is a 2S LiPo; if the balance connector has 7 wires, it is a 6S LiPo. The balance connector gives you individual access to each cell and is used to equalize the voltage across all your cells.

Just remember, the higher the S, the higher the voltage.

Voltage (V)

The voltage of your LiPo battery is linked to the number of cells (S) contained within the battery pack. They go up in increments of 3.7V and generally, you will find LiPos from 3.7V (1S LiPo) to 22.2V (6S LiPo).

Many hobbyists tend to think that higher voltage equates to a higher speed. This is somewhat correct, however, technically voltage is directly correlated with power - and power does not necessarily mean speed. For example, a heavy RC rock crawler will need a lot more power to drive through harsh terrains and overcome obstacles. An RC drift car, on the other hand, can use a much smaller voltage LiPo battery and still be much quicker than our off-road friend. When you buy an RC car or plane, you will normally find what voltage battery you need in the specifications; so don't worry too much about it.