



Guidelines: Ensuring long life operation of LiPo batteries

Introduction

Lithium Polymer (LiPo) batteries have become the power source of choice for many applications due to their high energy density, light weight, and flexibility in form factor. However, ensuring their long-term operation requires careful management, particularly in terms of charging and discharging practices.

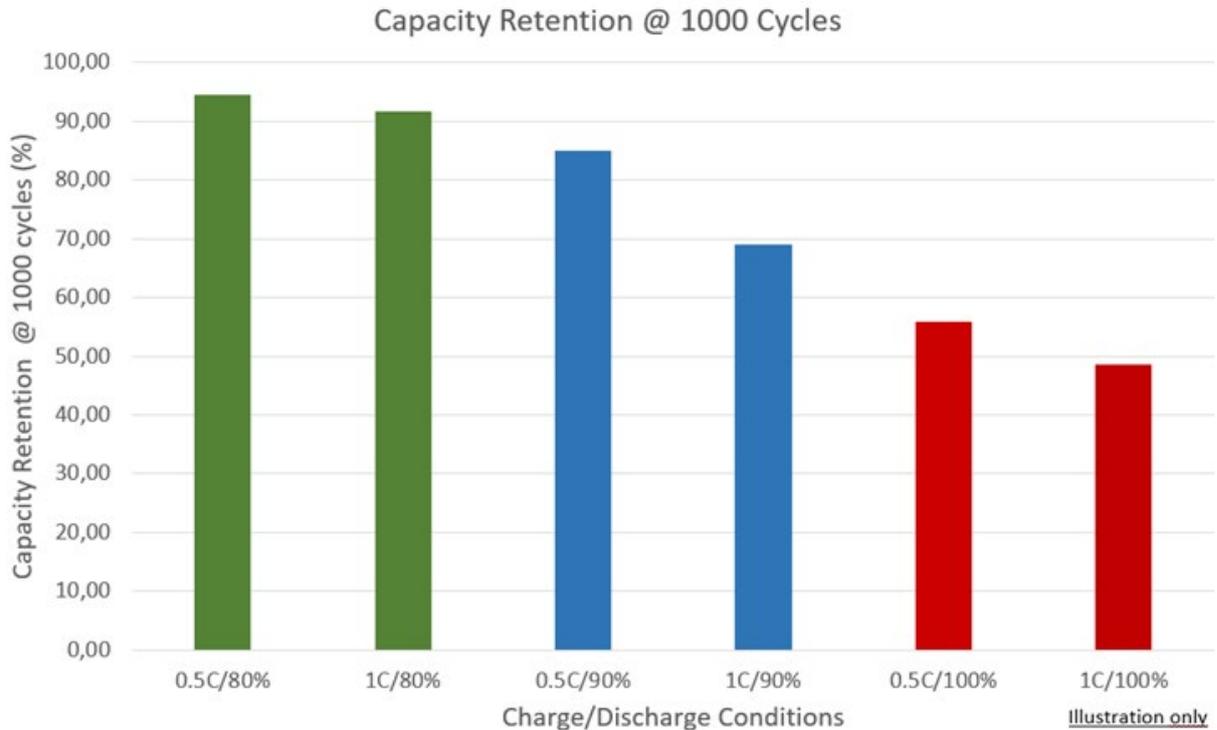
In general, Renata batteries are guaranteed to last 500 cycles, or as many cycles specified in the specifications. If longer cycle life is required, this document provides some tips that may help lengthen the life of the battery.

Key points for prolonging LiPo battery life

1. Avoid Charging to 100% and high charge rates

Charging a LiPo battery to its maximum capacity can lead to a reduction in its overall cycle life. High charge rates can also generate heat and cause the battery to degrade faster.

If long cycle life is needed, it is recommended to charge the battery up to 80-90% of its capacity and use a lower charge rate.



Reduce charge and discharge current as much as possible

The maximum allowable charge and discharge currents are specified in the product specifications. Lower current reduces the heat generation, which will help to reduce degradation during operation.

Avoid Keeping/storing fully charged LiPo batteries at high temperatures, as this can cause accelerated degradation of available capacity.

2. Recharge as often as possible

Frequent recharging, before the battery is depleted, can help to prolong the cycle life of a LiPo battery. This is because each complete discharge and recharge cycle causes the battery to wear out slightly. By keeping the discharge depth shallow, the wear on the battery can be reduced.

3. Maintain low discharge rates

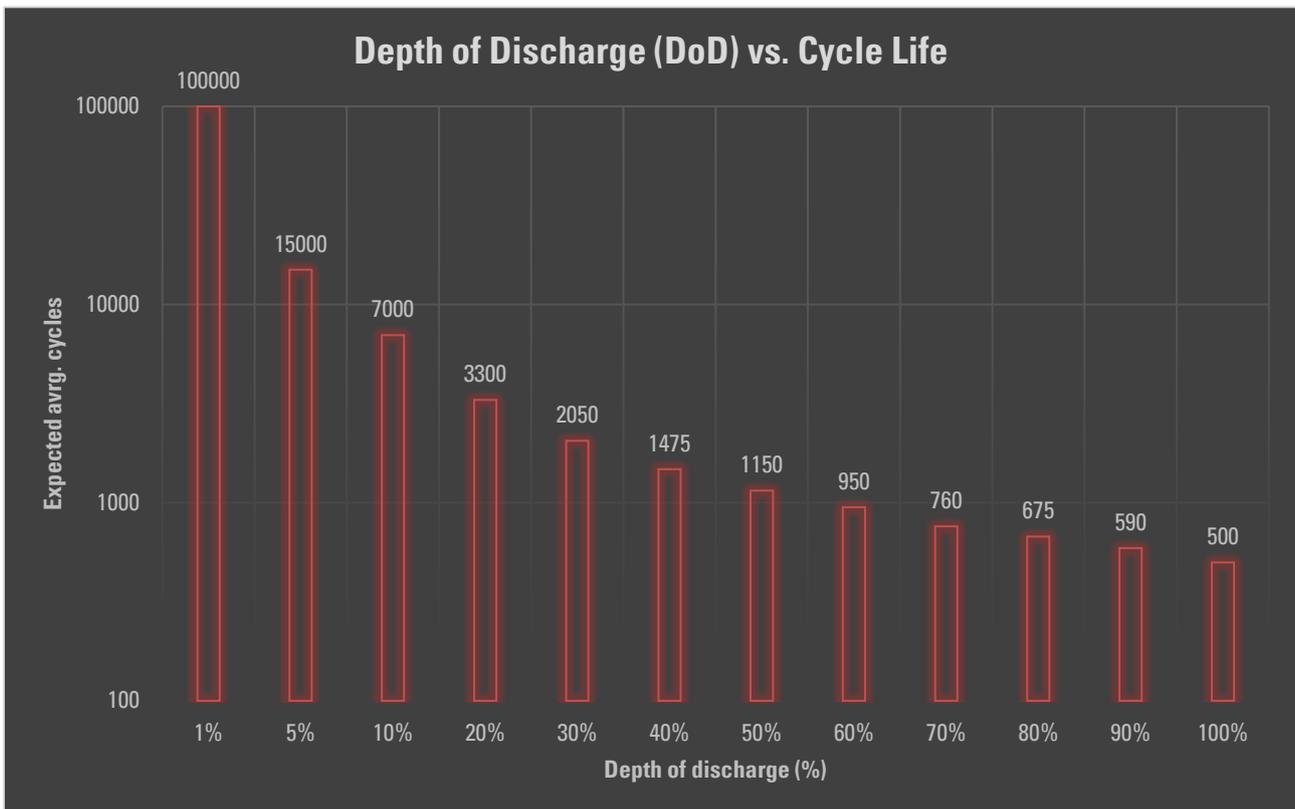
Maintaining low discharge rates can help prolong the life of a LiPo battery. High rates, means quick discharges, can cause heat build-up and accelerate the degradation of the battery's internal compounds.

4. Avoid deep discharge

Deep discharging, or allowing the battery's voltage to drop too low, can cause irreversible damage to a LiPo battery, or even safety concerns. It is recommended to recharge the battery well before it drops below 3.0 Volt. If the battery must be stored for a long time, it is a good practice to charge them to about 3.8 V, where the self-discharge rate is low, and periodically monitor the voltage to make sure that it does not decrease below 3.0 V.

5. Factory dispatch charge level

LiPo batteries are typically dispatched from the factory with a charge level of around 30% as regulated by the IATA and other transportation agencies. This is done to ensure safe transportation and storage. It is recommended to inspect the voltage of the batteries as received and charge the battery accordingly if the voltage is too low, as described below.



6. Recharge soon after reception

Indeed, the self-discharge and the consumption of the protection circuit can drain small LiPo batteries very quickly even without external load. Therefore, it is recommended to recharge the batteries soon after reception. This practice ensures that the battery does not run into deep discharge during storage, which could lead to irreversible damage.

7. Storage:

Lithium polymer batteries are sensitive to high temperatures and high voltages. If they are stored fully charged or in a hot environment, they can degrade faster and lose capacity. Therefore, it is better to store them at a moderate temperature and at a reduced voltage of 3.8-4.0V. This will help to preserve their performance. The higher the state of charge of a lithium polymer battery, the more it loses its charge over time. At room temperature, a Lithium polymer battery has a self-discharge rate of about 2%/month plus the consumption of the applied safety circuit.

Conclusion

By following these guidelines, users can ensure that their LiPo batteries operate efficiently for as long as possible. Remember, proper care and handling are crucial for maximizing the lifespan of your LiPo batteries. The less energy you use, the longer the life of the battery.

Contact:

Renata SA
Kreuzenstrasse 30
4452 Itingen
Switzerland
Tel.: +41 61 975 7575
E-Mail: sales@renata.com