

HOW TO USE BATTERIES CORRECTLY TO MAXIMIZE THEIR PERFORMANCE

Wow uses the best quality lithium-ion batteries

- >> These batteries have a complex technology and their performance depends on numerous variables, which in turn **affect the performance of the WOW scooter**.
- >> All rechargeable batteries have a **life cycle**, capacity and performance decrease over time as they age.
- >> To guarantee the best performance and **minimize the aging of WOW batteries**, it is necessary to know and respect some simple rules which are described here and which are valid for all lithium batteries.

Batteries maintenance

A lithium battery stays healthy if it is used often:

So keep it in training with charge / discharge cycles at least once a week.

If you plan not to use it for a while, **unplug it from the scooter** and store it in a cool place with a state of charge preferably between 40% and 60%. Remember that not using it will age prematurely if the charge is very high (above 85%) or very low (below 20%). Also remember that if you don't use it, it will age prematurely if the temperature is higher than 35°C.



If you plan not to use it for more than two weeks, keep in mind that the battery is subject to a normal phenomenon called self-discharge. The battery charge will reduce by about 3-4% every month, also considering the consumption of the electronic circuits inside the battery.

Avoids that, due to the effect of self-discharge, the charge during the period of inactivity falls below 20%. The self-discharge will be higher in the presence of a high temperature, so storage should be done in a place with a **temperature below 25°**.



Do not overheat the batteries. The main enemy of a lithium ion battery is heat which causes it to age faster. When approximately 45°C is exceeded, battery aging accelerates. The longer the battery will spend above this temperature (and the higher the temperature above 45°), the greater the damage is.

Battery charge and discharge



During use it is best to **avoid completely discharging the battery**. It is preferable not to discharge the battery below 15-20% (Low Battery). Excessively low states of charge can cause chemical/thermal stress inside the battery and premature aging. It is therefore useless and strongly discouraged to reach 0%, also because lithium batteries do not suffer from the memory effect.

The optimal range of use is therefore with states of charge above 15%.

Lithium batteries prefer **short and frequent charge/discharge** cycles instead of full 0% to 100% charge/discharge. From a theoretical point of view, the longest battery life would be obtained with charge / discharge cycles between 35% and 90%. This is not always practically feasible and very often the charge cycle brings the battery to 100%. Ideally, the batteries should remain at maximum voltage for as short a time as possible, and for this purpose it would be preferable to charge them to 100% just before using them. Also, try to charge the battery frequently (for example when it reaches 50% charge), without waiting for it to reach too low levels



Winter and low temperatures

Winter and low temperatures drastically **reduce the charge and discharge capacity** of all lithium batteries. Capacity reduction can reach 35%.

This is a well-known phenomenon and has nothing to do with battery degradation. In fact, with the return of the warm season, autonomy tends to rise again.



- » **During charging**, low temperatures significantly reduce the battery's ability to store energy. During a charge carried out at a temperature below 10°C, due to the effect of chemical phenomena which increase the internal resistance of the battery, even if the indicated charge will be 100%, in fact the battery will have accumulated a smaller quantity of energy. Before charging, if possible, it is best to bring the battery to a temperature of at least 20°C.
- » **During discharging**, a low temperature causes an increase in battery resistance. Demanding energy on a battery with high resistance will result in a greater voltage drop across the battery, especially if the state of charge is low. For this reason, during the winter, it is preferable to use the battery with a state of charge above 45-50%. Below these values it is normal to see a reduction in performance and autonomy.

It is preferable **not to use the batteries when it is very cold, below 0° C**. The sudden heating that occurs when using a cold battery can cause localized internal overheating and consequent damage

