



Characteristic of Battery





Characteristics of a Battery



The following battery characteristics must be taken into consideration when selecting a battery:

- Voltage & Discharge Curve
- Current Curve
- Energy Density
- Power Density
- Energy Efficiency
- Cycle Life
- Shelf Life & Self Discharge



1. Voltage :

A good battery should produce high constant voltage. The discharge curve is a plot of voltage against time of usage. A flat discharge curve is desirable as this means that the voltage remains constant as the battery is used up.

2. Current Capacity

The **capacity of a battery** indicates the current in ampere-hours (Ah), which represents the discharge current that a battery is able to produce over the course of time. Installing a battery that has a higher Ah offers a longer runtime, just as a smaller Ah provides a shorter runtime.

Power density

The power density is the current that can be derived per unit weight of the cell.

$$\text{Power Density} = I E / W$$

Where I is the current, E is the voltage & W is the weight of the battery.



Energy density

The energy density is the current energy that is available per unit weight of the cell
Energy Density = $I E * t / W$ Where I is the current, E is the voltage & W is the weight of the battery and t is the time period that the cell can produce the energy.

Energy Efficiency:

It is the ratio between amount of current produced during usage to amount of current consumed during charging.

Cycle life

The cycle life of a rechargeable battery is the number of discharge/charge cycles it can undergo before its capacity falls to 80%. This is typically between 500 and 1200 cycles.

Shelf Life

The battery shelf life is the time a battery can be stored in active before its capacity falls to 80%. The reduction in capacity with time is caused by the depletion of the active materials by undesired reactions within the cell.