



## WHY BATTERIES DIE

**LITHIUM BATTERIES:** Formation of the electrolyte oxidation at the cathodes in LifePO4 Lithium batteries leads to sudden capacity loss. Keeping the cells at a high voltage, rapid discharge rates and at an elevated temperature promotes electrolyte oxidation at the cathodes leading to as much as 30% of capacity loss in the first year.

Despite claims to the contrary, Lithium batteries of all types usually die after approximately 1,000 cycles or about 3.5 years.

Lithium batteries are relatively expensive and can combust if overcharged into a “thermal runaway” condition.

**LEAD ACID (FLA), GEL, AGM:** High temperatures, high charging rates, and over charging can cause electrolyte loss in non sealed batteries resulting in reduced battery performance. In sealed batteries, the same factors will cause an increase in temperature and pressure which can eventually result in the release of gas (and possibly electrolyte) from valves.

**SULPHATION:** As a lead acid battery discharges, lead sulphate crystals are deposited on the plates as part of the normal chemical reaction that results in the flow of electrons (at the same time, the sulphuric acid electrolyte is being converted to water).

**DESULPHATION:** During charging, the chemical reaction is reversed and the lead sulphate crystals are converted back to lead on the negative electrode and lead oxide on the positive electrode.

*Desulphation can also be achieved by adding certain chemicals to the electrolyte and/or by applying a rapid discharge and high voltage recharge using equipment specialized for this process.*

When used in applications where the battery is moved or shaken (auto and boat) lead acid battery sulphation at the bottom of the battery is reduced.

**Lead acid batteries of all types can exceed 1,000 cycles and 4+ years with proper maintenance.**

*Lead Acid batteries are inexpensive, durable and can be completely restore and recycled making them a good choice for auto, marine and solar applications of all kinds.*

**PowerLord LEAD ACID Batteries are reconditioned to 100% of their original charge and condition. PowerLord Batteries are ideal for auto, marine and solar applications of all kinds, in most applications guaranteed for 36 months.**