

## ***Types of Batteries***

Basically the major types of batteries are as follows:

- ***Starting Battery***

Sometimes it is called SLI (Starting, Lighting and Ignition) battery and it is designed to start and run engines. It delivers quick bursts of energy (such as starting engines) and have a greater plate count.

The plates will also be thinner and are composed of a Lead "sponge", similar in appearance to a very fine foam sponge. This gives a very large surface area, but if deep cycled, this sponge will quickly be consumed and fall to the bottom of the cells.

Automotive batteries will generally fail after 30-150 deep cycles if deep cycled, while they may last for thousands of cycles in normal starting use (2-5% discharge).

Starting batteries are usually rated at "CCA", or cold cranking amps, or "MCA", Marine cranking amps - the same as "CA".

- ***Deep Cycle Battery***

These batteries are used mainly on golf cart, scooter, solar, RV, etc has less instant energy but greater long-term energy delivery.

They are designed to be discharged down as much as 80% time after time, and have much thicker plates. The major difference between a true deep cycle battery and others is that the plates are SOLID Lead plates - not sponge.

Deep cycle batteries are usually rated at "AH" or Amperes Hour.

- ***Marine Battery***

These batteries are usually actually a "hybrid", and fall between the starting and deep-cycle batteries. The plates may be composed of Lead sponge, but it is coarser and heavier than that used in starting batteries.

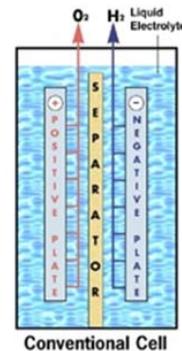
"Hybrid" types should not be discharged more than 50%.

## Major types of battery construction:

- **Wet Cell (Flooded)**

Wet or Flooded cell batteries are divided into low maintenance (the most common) and maintenance free (or sealed), which is based on their plate formulation.

Low maintenance batteries have lead-antimony/antimony or lead-antimony/calcium (dual alloy or hybrid) plates thus the maintenance free batteries use lead-calcium/calcium.



Conventional Cell

- **AGM**

The Absorbed Glass Matt (AGM) are also sometimes called "starved electrolyte" or "dry", because its fiberglass mat is only 95% saturated with Sulfuric acid and there is no excess liquid.

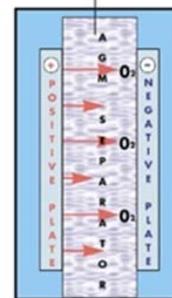
This construction allows the electrolyte to be suspended in close proximity with the plate's active material. In theory, this enhances both the discharge and recharge efficiency.

Nearly all AGM batteries are sealed valve regulated (commonly referred to as "VRLA" - Valve Regulated Lead-Acid).

Most valves regulated are under some pressure - 1 to 4 psi at sea level.

Popular usages are high performance engine starting, power sports, deep cycle, solar and storage battery.

Electrolyte in Absorptive Glass Mat

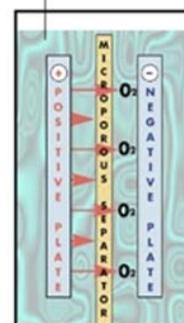


AGM Cell

- **GEL Cell**

The Gel Cell is similar to the AGM style because the electrolyte is suspended, but it is different because technically the AGM battery is still considered to be a wet cell. The electrolyte in a GEL cell has a silica additive that causes it to set up or stiffen. All Gel Cell batteries are sealed and a few are "valve regulated", which means that a tiny valve keeps a slight positive pressure.

Gelled Electrolyte



GEL Cell

The recharge voltages on this type of cell are lower than the other styles of lead acid battery. This is probably the most sensitive cell in terms of adverse reactions to over-voltage charging. If the incorrect battery charger is used on a Gel Cell battery, poor performance and premature failure is certain.

Gel Cell batteries are best used in VERY DEEP cycle application and may last a bit longer in hot weather applications.

The Gel Cell and the AGM batteries are specialty batteries. They store very well and do not tend to sulfate or degrade as easily as Wet Cell.

Also, there is little chance of a hydrogen gas explosion or corrosion when using these batteries which made them the safest lead acid batteries.