

GEL vs. AGM Sealed Batteries

AGM (absorbed glass mat) or **VRLA** (valve regulated lead-acid) batteries have a glass mat that is specifically designed to wick the battery electrolyte between the battery plates. AGM batteries contain only enough liquid to keep the mat wet with the electrolyte so if the battery is broken no free liquid is available to leak out. The lead plates within AGM batteries are typically thin and housed in a rigid case to withstand pressure. A valve ensures that the pressure does not build up excessively.

In **Gel** Batteries the electrolyte is immobilised by a silica type gel. This thick paste like material allows electrons to flow between plates but will not leak from the battery if the case is broken. The electrolyte is slowly lost through electrolysis.

Commonly, **AGM** Batteries are mistakenly identified as **Gel** Batteries. Both batteries have similar traits; such as being non spillable, deep cycle, may be mounted in any position (except inverted), low self discharge, safe for use in limited ventilation areas and may be transported via Air or Ground safely without special handling. Both are maintenance free and do not need 'topping-up'.

AGM Batteries are preferred when a high burst of power may be required. They also offer very good charge-discharge efficiencies, approaching 90%. Because the batteries are valve regulated they can tolerate a small degree of over-charge without being damaged. In most cases recharge can be accomplished by using a good quality standard battery charger or engine alternator. The life expectancy; measured as cycle life or years depending on the application is very good if the batteries are not discharged more than 60% between recharges. AGM Batteries do not recover from deep discharge very well and should be maintained at a full state of charge whenever possible. They must be fully recharged before storing. The recovery process requires special charging and discharging equipment.

Gel Batteries do not offer the same power density compared to a similar size AGM battery. The Gel battery excels in slow discharge rates and slightly higher ambient operating temperatures. Because of this, Gel Batteries are often used in deep discharge applications. The charge-discharge efficiency for Gel Batteries is similar to flooded batteries which is approximately 75%. One issue with Gel Batteries that must be addressed is the CHARGE PROFILE. Gel Batteries must be recharged correctly or the battery will suffer premature failure. The battery charger being used to recharge the battery must be suitable for recharging Gel Batteries. If you are using an alternator to recharge a Gel battery a special regulator may be required, otherwise the battery may 'dry-out'.

Summary:

	AGM	Gel
Power density	Excellent	Poor
Tolerance to overcharge	Good	Fair
Orientation	Any, except inverted	Any, except inverted
Shelf life	Very good	Good
Ability to recharge fast	Excellent	Poor
Shock and vibration resistance	Very good	Fair
Tolerance to undercharge	Poor	Fair
Cycle life	Good	Good