Solar charging flooded vs sealed

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We"ve written an in-depth comparison of lead-acid vs. lithium batteries previously on this blog, but here are the Cliff"s Notes: lithium is the premium option, with a longer lifespan and fewer maintenance requirements. Lead-acid costs much less up front, but regular check-ins are required to keep the battery bank working properly.

This article will focus on the differences between the main lead-acid battery types used in the solar industry. You"ve got flooded lead-acid and sealed lead-acid batteries, and the latter group can be broken down into AGM (absorbent glass mat) and gel batteries.

Every battery type has a different purpose and use case, so let"s go over the pros and cons of each.

For many years, the flooded lead-acid battery has been the standard in the solar industry. This type of battery is also used in golf carts and forklifts. They are the most cost effective and longest lasting of the lead-acid batteries.

These batteries are meant to be mounted upright so that the electrolyte does not leak out of the caps on top. (Since sealed batteries are…well, sealed, you can mount them in any orientation without fear of them leaking. Not the same for flooded batteries.)

While this is the most economic battery on the market, it will only reach its potential lifespan if they are maintained properly. The levels must be checked monthly and topped off with distilled water to ensure the longest possible lifespan.

Note: flooded lead-acid batteries release toxic hydrogen gas when charging. They need to be enclosed and vented to the outside to prevent this gas from being trapped and creating a hazardous environment.

The sealed lead-acid batteries are very similar to the flooded version, but there is no access to the inside compartment. This means that you do not have to add distilled water. The electrolyte is sealed inside, and there is enough to allow the battery to live out a calculated number of cycles.

Absorbent Glass Mat batteries are the most popular VRLA battery because they can work in a wide range of conditions. The electrolyte is suspended in a thin fiberglass mat that is situated between the lead plates. This allows the battery to be resistant to vibration, which makes them a great choice for RV and other mobile applications.

They are perfect for mobile applications, places where leaked acid would be problematic, remote locations where maintenance will not be possible on a regular basis, and places where the batteries could be subject to

extremely cold temperatures.

Gel batteries are the most costly of the VRLA batteries, but excellent candidates for projects that need a very slow deep discharge. They also last a bit longer in hotter temperatures, so you might pick them if you are concerned about high ambient temperatures in the space where the batteries are enclosed.

Gel batteries are more expensive than other lead-acid battery types, so they are not ideal outside a handful of specific solar applications (very hot climates, mainly). The technology has been eclipsed by other battery types that have been developed more recently.

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