



## COMPARING GOLF CAR BATTERIES

When it comes time to purchase a new set of batteries for your golf car or complete fleet, it makes sense to compare products and shop for the best value. Because there are so many batteries available for a single type of vehicle, it's important to make sure you're comparing batteries with the same internal construction (Flooded vs AGM vs Gel), voltage output, and capacity ratings. This is where it can get confusing for many golf car owners and fleet managers.

The information on the labels can sometimes be confusing as manufacturers don't always list the same testing criteria, making comparisons difficult. An example of this is when trying to compare two similar batteries that show different battery cycle life ratings. Battery cycle life ratings are often based on selective data from the manufacturer.

### Comparing Depth Of Discharge

Typically, cycle life ratings are determined based on the depth of discharge (DOD), the percentage of amp-hour (AH) capacity discharged from the battery on each discharge. Most battery manufacturers recommend a 50 percent DOD for optimum cycle life vs runtime. The problem is that cycle life can be quoted at a wide variety of DOD ratings which can result in what appears to show a longer cycle life for one battery type over another. This makes for a comparison that is not accurate. When comparing cycle life ratings, make sure they are rated using the same DOD.

### Comparing Amp-Hour Ratings

Amp-hour ratings are often used to compare similar lead-acid batteries and can also be misleading. As an example, a 6-volt battery may list its amp-hour (Ah) rating as 200 Ah at the "20hr rate". This means that the battery will provide 10 amps of current for 20 hours until the battery is fully discharged or "spent". A common mistake is assuming that a battery with a 200 amp-hour rating will provide 200 Ah at all discharge rates. Enter Peukert's law. This states that battery capacity decreases as the rate of discharge increases. If the

same 200 Ah battery is fully discharged at a higher rate over five hours, the battery will deliver only about 150 Ah at 30 amps. Also, the relationship between battery capacity and the rate of discharge

is not linear, so it is important to find the rated capacity at the discharge rate for the application in which you plan to use the battery. Most battery manufacturers publish tables of ratings vs discharge rate or discharge time for each battery type.

### Look At Runtime Ratings

Even though manufacturers list various amp-hour ratings, it's often difficult to know which ones to use in order to make the right comparison for your application. It may be more accurate to use the runtime ratings in minutes that can typically be found on the battery manufacturer's spec sheets and websites. As an example, U.S. Battery publishes ratings that show how many minutes a battery can provide at 25, 56,

and 75 amp-draws. By comparing the rated runtime in minutes, you'll get a better idea of the performance you can expect when comparing two similar batteries. These runtime ratings are based on the actual discharge currents seen in typical applications and may be more applicable than the amp-hour ratings. For example, RV and marine discharge rates usually fall into the 25 amp range while most golf car discharge rates fall into the 56–75 amp range (56 amps for 48 volt cars and 75 amps for 36 volt cars).

### Key things to remember when comparing batteries:

Cycle life comparisons should be made at the same depth of discharge (DOD).

Amp-hour ratings should be compared using the same discharge time and/or discharge current that will be used in the application.

Run-time ratings may be the most accurate comparisons when selecting a battery for a given application.

