



LORENTZ

Trimetric
Battery Monitors

Durham , United Kingdom Tel 0044 (0) 1916450434 www.prismsolar.co.uk
 Freginals , Tarragona Spain Tel 0034 977 053 057 www.prismsolar.eu

Battery Life Span versus dept of Discharge

A battery "cycle" is one complete discharge and recharge cycle. It is usually considered to be discharging from 100% to 20%, and then back to 100%. However, there are often ratings for other depth of discharge cycles, the most common ones are 10%, 20%, and 50%. You have to be careful when looking at ratings that list how many cycles a battery is rated for unless it also states how far down it is being discharged. For example, one of the widely advertised telephone type (float service) batteries have been advertised as having a 20-year life. If you look at the fine print, it has that rating only at 5% DOD - it is much less when used in an application where they are cycled deeper on a regular basis. Those same batteries are rated at less than 5 years if cycled to 50%. For example, most golf cart batteries are rated for about 550 cycles to 50% discharge - which equates to about 2 years.

Battery life is directly related to how **deep** the battery is cycled each time. If a battery is discharged to 50% every day, it will last about twice as long as if it is cycled to 80% DOD. If cycled only 10% DOD, it will last about 5 times as long as one cycled to 50%. Obviously, there are some practical limitations on this - you don't usually want to have a 5 ton pile of batteries sitting there just to reduce the DOD. The most practical number to use is 30% to 40% DOD on a regular basis. This does NOT mean you cannot go further once in a while. It's just that when designing a system when you have some idea of the loads, you should figure on an **average** DOD of around 35% for the best storage vs cost factor. As Deep Cycle batteries can be discharged as low as 80% without lasting damage but at the expense of cycle life. Also, there is an upper

limit - a battery that is continually cycled 5% or less will usually not last as long as one cycled down 10%. This is because at very shallow cycles, the Lead Dioxide tends to build up in clumps on the positive plates rather in an even film. The graph left shows how lifespan is affected by depth of discharge. The chart is for a the Rolls Series 4000 and 5000 renewable energy range , but all lead-acid batteries will be similar in the shape of the curve, although the number of cycles will vary.

