



How to discharge lifepo4 battery

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Having recently had a 4 x 100 Ah LiFePO₄ system installed, I am finding hard to shake off the habits learned from a crappy lead acid system & allowing the state of charge to dip to 50% goes against the instincts learned from past experiences. What am I safe to use out of these batteries? Lots of hearsay, not too many hard facts.

One thing to keep in mind is that charging your lithium batteries to 100% all the time is also not a great idea. Most chemistries do best when charged to no more than 80-90% of capacity and only occasionally run to 100% to resync BMSes and BMVs et al.

Battleborn says this: "Most lead acid batteries experience significantly reduced cycle life if they are discharged more than 50%, which can result in less than 300 total cycles. Conversely LIFEP₄ (lithium iron phosphate) batteries can be continually discharged to 100% DOD and there is no long term effect. You can expect to get 3000 cycles or more at this depth of discharge. "

A thought about some tables that show 5000 cycles at 50% DoD vs 3000 at 80%.. I think that their definition of cycle life is that a 50% DoD cycle on a "100ah" battery is only 50 ah so you would expect to get twice as many cycles. There is a reportedly real advantage to shallower DoD, but if it was measured in total AH of usable power and not as smaller 50 ah cycles compared to larger 80 ah cycles, for example, the difference in total life would be smaller - certainly not double.

I also understand, as mentioned, that cramming that last bit of charge into the battery to hit 100% is the biggest stress for the battery. With that in mind, I'll charge to only 95% capacity and also cutoff loads @ 10% on the bottom end, in order to extend life. Most of the time, I don't need anywhere near the 85% of my battery bank.

But it's all there to use. Sometimes it's raining a lot and I need more capacity for a situation, then I'll use 100%. It's only on occasion and nice to be able to have the full 100% without damaging the battery, just maybe dropping the life by a tiny percent since the full discharge is not repeated.

Another point: With my particular RV use, (seasonal) I was thinking about how long it would take me to use 3000 full cycles and I'm not sure I even need my Lithium to last 5000 cycles. By 2030 there will likely be better cheaper batteries! And anyway, the lithium doesn't drop off rapidly at that point like a Lead Acid, it just drops to 80%, then 70% slowly....I could then add just 25% more battery and bring my capacity back up to good as new for 1/4 the cost of full replacement.

It depends on the application and just how much excess capacity was available when the system was new. You can certainly design in a higher capacity, allowing you to continue to get useful life beyond the typical 80%. If you are doing that, it's important to factor in the increased DC internal resistance as they degrade, which reduces the safe maximum current capability (in addition to the reduced energy capacity); i.e. they will

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generate more heat internally for the same current as they age, and the voltage will sag more heavily under load.

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