



## BATTERY FREQUENTLY ASK QUESTIONS (FAQ)

**Q1) What is the definition of "cycle use" and standby use"? "Cycle Use" - direct power source:**

**A.)** It can provide the power supply to power tools, portable electronic products. It can also be used for cycling charging and discharging usage such as electronics motorbike or vacuum cleaner. "Standby Use - back up power:  
Mainly used for emergency power to avoid future damage that may be caused by a sudden power outage.

**Q2) What are the concerns when using batteries in a parallel or a serial series?**

**A.)** 1. Do not mix brands, models and date codes?  
2. No separate discharge then charging in a serial configuration.  
3. Under parallel usage, pay close attention to the differences in voltage in each circuit.  
4. If the difference in voltage in each circuit is too high, do not charge/discharge as parallel.  
5. The environment of all circuits must be similar.

**Q3) How can you check a battery's performance?**

**A.)** Different usage applications will use different methods for evaluating a battery's performance. Using a 20 hour rate or the 10 hour rate, you can use 0.05CA or 0.1 CA to discharge the battery until the battery reaches a terminal voltage of 10.25 volts. You can then calculate the amp hours to see if the battery fits the specifications or not. For a 5 minutes rate, such as the HC1221 W, you can use a 21 watts/cell discharge till the terminal voltage reaches a terminal voltage of 9.6 volts and then measure the discharge time to see if it meets the final specifications or not.

**Q4) How can the conversion be made between "watts (W)" and "amp hours (Ah)"?**

**A.)**  $W = 1 \times V = 41(15 \text{ minute rate}) = 2CV = 2V$   
(Ex. HC1217W =  $17/4 = 4.25Ah$ )

**Q5) When should a deep-cycle battery be used?**

**A.)** Deep-cycle batteries are used when 50% or more of the capacity is used per cycle. The most common use of deep-cycle batteries is in applications that require deep, repetitive drain, like powerful car audio systems, trolling motors, golf carts, electric wheelchairs, Inverter house power sources. Public safety and high-performance vehicles are other applications that call for the special characteristics of deep-cycle batteries.

**Q6) Does the deep-cycle battery have a "memory"?**

**A.)** No. The performance of deep-cycle batteries will be reduced over time, but deep-cycle batteries do not suffer from "memory effect" such as NiCd batteries do.

**Q7) How are batteries rated?**

**A.)** Lead acid batteries are rated based on a capacity given in a defined time. There is not a set industry standard for how to rate a battery.

**Q8) How long a battery can last?**

A.) The service design life of a battery are vary considerably with how it is used, how it is maintained and charged, temperature, and other factors.

**Q9) Do I need to add water to my battery?**

A.) No. Sealed lead acid batteries do not require the use of water.

**Q10) What determines the life of an VRLA battery?**

A.) Sealed lead acid battery life is determined by many factors. These include temperature, depth and rate of discharge, and the number of charges and discharges(called cycles).

**Q11) What is the difference between float and cycle applications?**

A.) A float application requires the battery to be on constant charge with an occasional discharge. Cycle applications charge and discharge the battery on a regular basis.

**Q12) Does overcharging damage batteries?**

A.) OVERCHARGING is the most destructive element in battery service. Usually the boater is not aware that this is occurring as he believes his alternator or battery charger is "automatic." Unfortunately, these automatic circuits are sensitive to voltage surges, heat, direct lightening strikes and indirect lightening electromagnetic influences and could fail or shift their calibration. When they fail, overcharging begins to effect the batteries. During overcharging, excessive current causes the oxides on the plates of the battery to "shed" and precipitate to the bottom of the cell and also heat the battery, thus removing water from the electrolyte. Once removed, this material (which represents capacity) is no longer active in the battery. In addition, the loss of water from the electrolyte may expose portions of the plates and cause the exposed areas to oxidize and become inactive, thus reducing additional capacity. Sealed batteries are not immune from the same internal results when overcharged. In fact, sealed recombination absorption and gel batteries are particularly sensitive to overcharging. Once moisture is removed from the battery, it cannot be replaced. Portions of the battery damaged due to overcharging are irretrievable. However, if detected early, corrective adjustments to the charging device will save the undamaged portion of the battery. Initial signs of overcharging are excessive usage of water in the battery, continuously warm batteries, or higher than normal battery voltages while under the influence of the charger. If overcharging is suspected, correct immediately.

**Q13) Does overdischarging damage batteries?**

A.) OVERDISCHARGING is a problem which originates from insufficient battery capacity causing the batteries to be overworked. Discharges deeper than 50% (in reality well below 12.0 Volts or 1.200 Specific Gravity) significantly shorten the Cycle Life of a battery without increasing the usable depth of cycle. Infrequent or inadequate complete recharging can also cause over discharging symptoms called SULFATION. Despite that charging equipment is regulating back properly, over discharging symptoms are displayed as loss of battery capacity and lower than normal specific gravity. Sulfation occurs when sulfur from the electrolyte combines with the lead on the plates and forms lead-sulfate. Once this condition becomes chronic, marine battery chargers will not remove the hardened sulfate. Sulfation can usually be removed by a proper desulfation or equalization charge with external manual battery chargers. To accomplish this task, the flooded plate batteries must be charged at 6 to 10 [amps. at](#) 2.4 to 2.5 volts per cell until all cells are gassing freely and their specific gravity returns to their full charge concentration. Sealed AGM

batteries should be brought to 2.35 volts per cell and then discharged to 1.75 volts per cell and their this process must be repeated until the capacity returns to the battery. Gel batteries may not recover. In most cases, the battery may be returned to complete its service life. CHARGING Alternators and float battery chargers including regulated photo voltaic chargers have automatic controls which taper the charge rate as the batteries come up in charge. It should be noted that a decrease to a few amperes while charging does not mean that the batteries have been fully charged. Battery chargers are of three types. There is the manual type, the trickle type, and the automatic switcher type.

**Q14) How can I evaluate the health and charge state of a battery?**

A.) Routine battery examinations divulge irregularities in the charging system as well as in the batteries. The principle method is to examine the electrochemistry of the battery through hydrometric electrolyte inspection. As previously discussed, this important examination cannot be accomplished with sealed absorption or gel batteries. Voltage readings alone require experience to interpret. Hydrometric readings will uncover early warnings of overcharging or overdischarging before batteries are damaged. The state-of-charge and reliability of a lead acid battery can best be determined by the specific gravity of the electrolyte measured directly with a common bulb-type hydrometer with a glass float. We do not recommend the ball float type hydrometer. Specific gravity is a unit of measurement for determining the sulfuric acid content of the electrolyte. The recommended fully charged specific gravity of marine batteries is 1.255 to 1.265 taken at 80??C More than .025 spread in readings between fully charged cells indicates that the battery may need an equalization charge. If this condition persists, the cell is failing and the battery should be replaced. Since water has a value of 1.000, electrolyte with a specific gravity of 1.260 means it is 1.260 times heavier than pure water while pure concentrated sulfuric acid has a specific gravity of 1.835.

