Why choose a Golf Mate golf cart?

All MiCaddy carts are fitted with lithium battery packs which have a 4 year warranty.
Enjoy the comfort and independence of owning your own golf cart ....

- The Amptron 36v 50Ah 70A Lithium $LiFePO_4$ and the 36v 100ah 200ah lithium $LiFePO_4$ fitted to MiCaddy carts are sealed battery packs with a four (4) year warranty.
  The normal warranty for Sealed Lead Acid (SLA) batteries is one (1) year.

- Unlike Lead Acid batteries, it is not necessary to keep the Amptron 36v 50Ah 70A Lithium LiFePO4 batteries fully charged and no negative impact to the battery life will be caused by storing the batteries in a partially charged state.

- Prior to longer term storage, it is recommended to discharge the Amptron 36v 50Ah 70A Lithium LiFePO4 batteries to approximately 50% or around 39V.

- You can expect many years of performance from the battery if properly maintained.

- To maximize the Amptron 36v 50Ah 70A Lithium LiFePO4 battery life, it is recommended to keep the temperature to below 45°C where possible.

To view the comparison between:

Lithium Battery Power

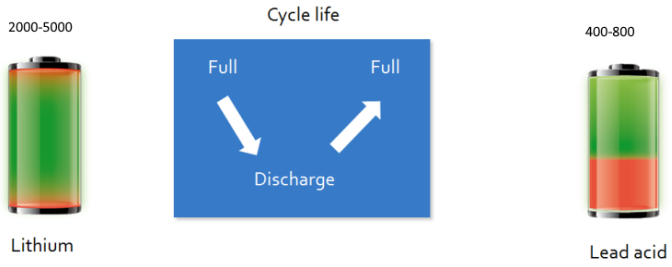
and

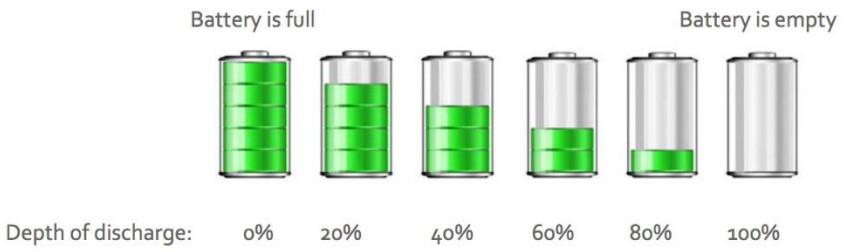
Sealed Lead Acid Power

Scroll down through the following pages...

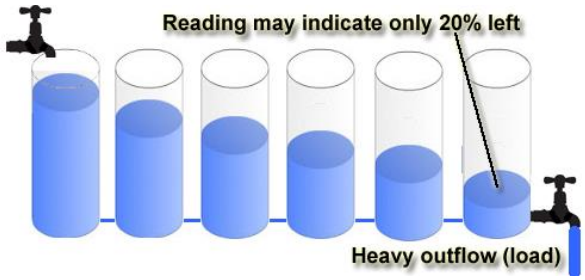
Comparison of $LiFePO_4$ and deep cycle Lead Acid (Flooded, AGM, Gel) batteries

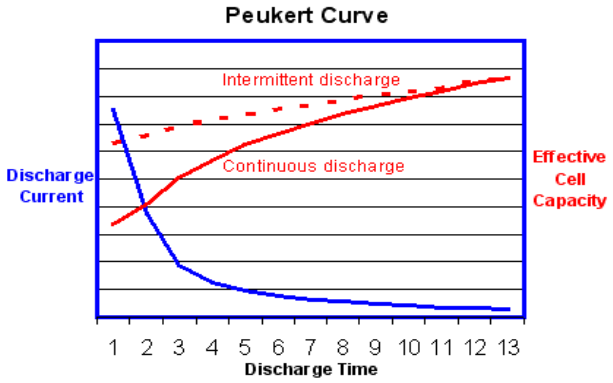
The table below summarises the comparisons between AMPTRON®'s Lithium Iron Phosphate ($LiFePO_4$) batteries vs. deep cycle Lead Acid batteries:

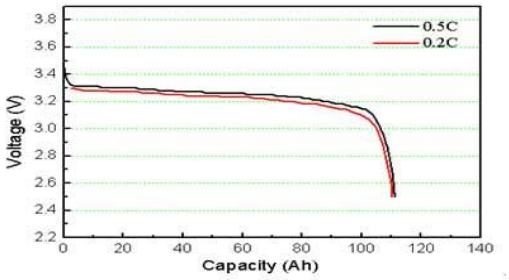
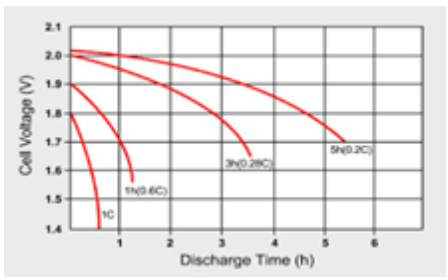
Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Cycle life		
	The expected lifespan of an Amptron $LiFePO_4$ battery is 4 to 10 times the lifespan of Lead Acid batteries.	
	Expected life of >2000 cycles at regular 100% Depth of Discharge (DoD), and up to 5000 cycles at 80% DoD. The typical estimated life of the AMPTRON® Lithium Iron Phosphate ($LiFePO_4$) battery is 7-15 years, or 2000 to 5000 charge cycles	Well looked-after AGM batteries might have a life of 400 to 800 cycles at 50% Depth of Discharge (DoD). Other lead Acid battery types are generally less.

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Depth of Discharge (DoD)		
	An Amptron $LiFePO_4$ battery will typically provide twice the usable energy than a deep cycle Lead Acid battery of the same rated capacity.	
	You can safely go down to 100% DoD of the rated capacity and still expect >2000 cycles. 100Ah of rated capacity yields the full 100Ah useable capacity – at least 2 times the useable capacity of an AGM.	It is generally accepted that the most economic and practical DoD for an AGM battery is 50% (the "50%" rule). Other lead Acid battery types have an even lesser practical DoD. 100Ah of AGM gives you 50Ah useable under the 50% discharge rule – at most 50% of the usable capacity of the 100Ah AMPTRON® $LiFePO_4$ battery.

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Weight		
	An Amptron $LiFePO_4$ battery provides 4 times the usable energy than a Lead Acid battery of the same weight.	
	Usable amp-hour for amp-hour, is about $^1/_4$ the weight of lead-Acid batteries. This ratio reduces further under heavy loads.	Usable amp-hour for amp-hour, is about 4 x the weight. This ratio increases further under heavy loads.

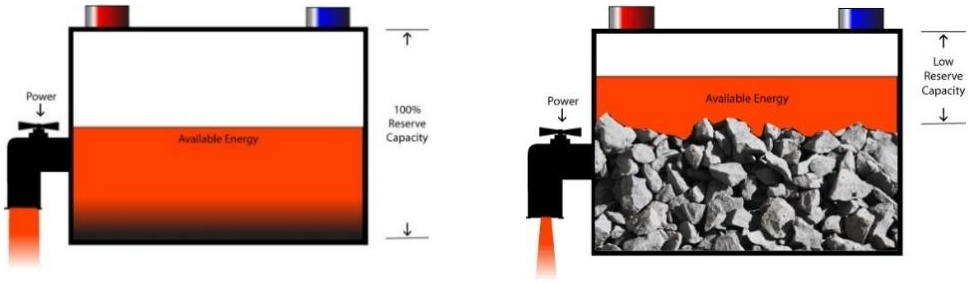
Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Voltage Drop		
	Constant heavy loads do not significantly impact the voltage of Amptron $LiFePO_4$ batteries, wheras the voltage of Lead Acid batteries significantly drops.	
	Minimal voltage drop under load. If a battery is at 13.3 volts and you pull a high current out of it, the voltage will still retain 13.3 volts while delivering the current demand.	Voltage drops significantly under load. Impacts are that lights can dim, appliance start cycles may get interrupted due to a voltage drop, or appliances may run inefficiently.

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Peukerts effect (The impact of current on the usable amp-hours)		
	Under heavy loads, the usable capacity of a Lead Acid battery is diminished, whereas the effect on the Amptron $LiFePO_4$ battery is negligible.	
	The AMPTRON® $LiFePO_4$ battery has a negligible effect in normal use.	The higher the current the fewer the amp-hours the battery will deliver. This effect progressively deteriorates as the battery ages. For example, a Lead Acid battery with a C20 capacity of 100Ah, will deliver 5 amps for 20 hours (5h x 20A = 100Ah). However, it will not deliver 50 amps for 2 hours (50A x 2h = 100Ah) or 100 amps for one hour. In effect, the higher current reduces the usable amp hours.

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Discharge Curve	 	
	For most of its discharge, even under heavy loads, the voltage of Amptron $LiFePO_4$ batteries remain close to maximum, wheras the voltage of Lead Acid batteries significantly and quickly drops.	
	Very flat discharge curve, this means that $LifePO_4$ batteries can hold its voltage near maximum during discharge at above 12.8V, until the battery reaches about 95% DoD.	Drops voltage significantly as the battery discharges. This may cause some appliances to pull a higher current, in an effort to compensate, run slow, have lack of power, may not work effectively or even stop functioning early before the usable energy is consumed.

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Charge time and charge rate		
	Amptron $LiFePO_4$ batteries charge much faster than Lead Acid batteries.	
	1. Tolerates a higher bulk charge rate than most deep-cycle Lead Acid batteries. The recommended charge rate for maximum cycle life is 0.5C i.e. 50A for a 100Ah battery, but can be charged up to 1C i.e. 100A for a 100Ah battery. 2. Can consume full charge until the batteries get to 14.6 volts, followed by about 20 minutes at that voltage for cell balancing (not capacity) and then float. Batteries are fully charged up to four hours earlier compared to Lead Acid batteries	1. The recommended charge rate for large size AGM batteries is 0.2C, i.e. 20A for a 100Ah battery. Higher charge rates will heat up the battery and due to internal resistance, the absorption voltage will be reached when the battery is charged at only 60% or less, this resulting in a longer absorption time required to fully charge the battery. High rate charging will therefore not substantially reduce the charging time of a Lead Acid technology battery. 2. Typically needs some hours at a constant voltage with tapering current to charge the last 20% (40% of usable capacity).

Category	AMPTRON® $LiFePO_4$ batteries	Lead Acid (Flooded, AGM, Gel) batteries
Charge Efficiency		
	Amptron $LiFePO_4$ batteries use less energy to fully charge than Lead Acid batteries of the same rated capacity.	
	Higher charge efficiency (>95%). That means to get 100Ah into the battery it might only require about 105Ah or less. This means less wastage of valuable solar energy, less generator run-time, and quicker time-to-full charge.	Lower charge efficiency (<75%). That means to get 100Ah into the battery will require >125Ah of charge.

Category	AMPTRON® $LiFePO_4$ batteries	Lead acid (Flooded, AGM, Gel) batteries
Storage Performance		
	Amptron $LiFePO_4$ batteries can be stored for much longer periods and at a lower charged state than Lead Acid batteries	
	Can be left or cycled in a partially discharged state for long periods with few or no adverse effects, such as sulphation.	Needs to be stored in a fully charged state and needs to be recharged regularly, or sulphation starts to occur which significantly impacts the cycle life.