

# deepcycle

## batteries

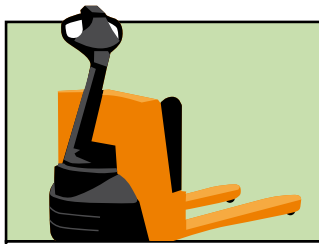
long lasting steady power



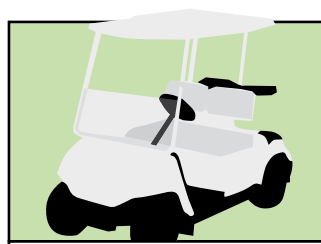
# Why choose a deepcycle battery?

Deep cycle batteries provide sustained power over extended periods of time and are designed to be repeatedly discharged and recharged.

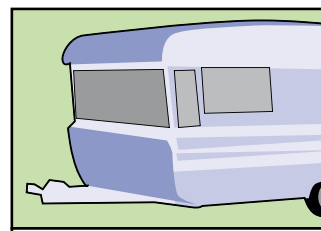
*Choose a deep cycle battery when you require long-running power and the peace of mind that your battery will last – charge after charge.*



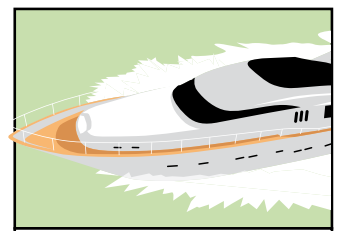
Pallet Movers



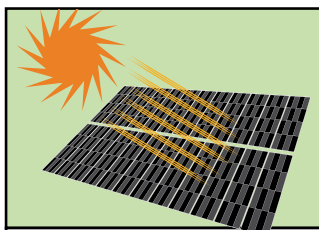
Golf Buggies



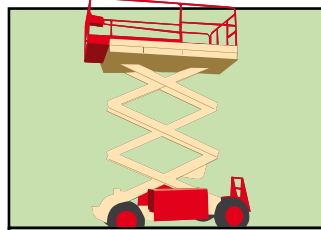
Caravans



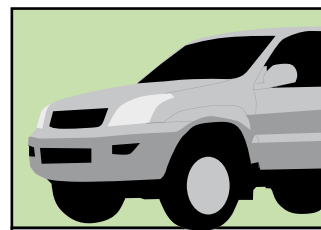
Marine



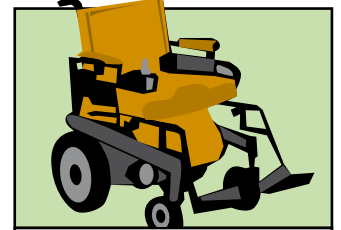
Solar



Scissor Lifts



4WD's



Wheelchairs

## Car batteries vs Deep Cycle batteries

### Car batteries

To understand why a deep cycle battery should be used in certain applications, we can compare a deep cycle battery with a standard car battery.

A car battery could be called "shallow cycle", providing a high burst of power for a short time, just long enough to start a car's engine. Only a small portion of the battery's power is used, and this is restored over time by the car's alternator.

Standard car batteries have thinner lead grids and porous active material (lead oxide based paste coated onto the battery grids) to maximise the surface area of grid exposed to the acid.

Maximising the surface area provides greater current flow and as a result, greater starting power. However, because car batteries have thinner grids and more active material, they are not as reliable in providing long periods of power.

### Deep cycle batteries

Unlike standard car batteries, deep cycle batteries are constructed with thicker grids of antimony lead alloy and a denser paste of active material to withstand discharge and recharge cycles.

This construction allows the deep cycle battery to deliver sustained power with low current drain for extended periods of time. Repeated cycling (discharge and recharge) does not cause the same level of damage that a car battery would sustain from the same process.

The ability to deliver steady power with long cycle life makes the deep cycle battery an ideal solution for a range of both recreational and industrial applications.

In recreational applications, deep cycle batteries may be found in golf buggies, caravans, electric scooters, four wheel drive vehicles, boats and electric wheelchairs.

Deep cycle batteries are also ideal for solar devices and industrial applications such as auxiliary power supplies, pallet movers and scissor lifts.



## Types of deep cycle battery

There are several different types of deep cycle batteries available, each with specific features you will need to consider when determining the best battery for your application.

### Flooded Batteries

These are the most basic widely used type of lead acid battery. Lead plates are suspended in wet acid which means electrolyte levels require periodic topping up. Flooded batteries are fairly tolerant of a range of charging rates and depths of discharge. However, leaving flooded lead acid batteries to stand in a discharged state can cause irreparable damage.

### Gel Batteries

The electrolyte of a gel battery is held in a jelly-like state, usually within a sealed case. Gel batteries can be left discharged for longer periods of time without affecting their ability to recover. However, the batteries require very strict monitoring of the charger voltage and a rest period is necessary after rapid charging to ensure the true charge state is known

### Absorbed Glass Mat (AGM) Batteries

AGM batteries consist of acid suspended in a special glass mat separator. This is state-of-the-art technology. AGM batteries have a higher charge acceptance rate than other types and they are not as susceptible as gel batteries to damage caused by lack of charge voltage control. These batteries are sealed and do not leak if the battery case is fractured.

### Spiral Batteries

These are a variety of AGM battery. Lead plates are in spiral configurations with acid saturated glass mat separators. They have a sealed case to eliminate acid spillage.

## Dual Battery Systems

You may choose to incorporate a deep cycle battery into a system where a standard car battery provides vehicle starting capacity and the deep cycle battery provides long lasting power for recreational accessories. Such systems are common with boats, 4WD's and motor homes.

A battery isolator controls the charging of batteries and separates them when the engine is turned off. This means you can get the most out of your deep cycle battery without running your starting battery flat.

## Sizing the right battery

Deep cycle batteries are available in a range of sizes to suit a range of applications. Whatever type of deep cycle battery you choose, it is important you have adequate battery capacity (amp hours) to suit your application.

The correct battery can easily be calculated by establishing the total power consumption of the application, the number of hours of usage and the operating voltage.

FOR EXAMPLE:					
Equipment	Loading (Watts)		Est. Usage (Hours)		Watt Hours
Winch	90	x	0.2	=	18
Fridge	40	x	10.0	=	400
Lights	20	x	4.0	=	80
<b>TOTAL WATT HOURS</b>					<b>= 498</b>

Now divide total Watt Hours by Voltage to obtain the required Amp Hours.

FOR EXAMPLE:		
498 Watt Hours ÷ 12 Volts	=	41.5 Amp Hours

Because vehicle electrical systems may not always be perfect, we must always allow a little extra power in reserve by factoring in at least a 30% safety margin.

FOR EXAMPLE:		
Estimated Amp Hours		41.5
+ 30% safety margin		12.45
<b>TOTAL AMP HOURS</b>	<b>=</b>	<b>53.95</b>

Simply compare your Total Amp Hour figure with the 20hr capacity figures shown in the product specifications to select the correct deep cycle battery for your needs.



## Get maximum life from your battery

The life of a deep cycle battery is directly affected by the depth of each discharge cycle. A battery discharged with 70% remaining capacity will last much longer than one discharged to only 20% remaining capacity. The ideal compromise between initial cost, battery life and usefulness is to aim for approximately 50% discharge between recharges.

The single greatest cause of battery failure is when the battery is left in a discharged state for a prolonged period of time. If the battery is not recharged to full capacity quickly, it can lead to permanent loss of part of the battery's capacity. This is particularly the case with flooded batteries. Also, leaving the battery in a discharged condition will also increase the likelihood of failure from a short circuit.

*Avoid discharging any battery too deeply and never leave it discharged for too long. Recharging to full capacity is the best way to ensure maximum battery life.*

## Keeping your battery charged

When repeatedly using a deep cycle battery, it is important to ensure the battery is charged to full capacity after use. Not only does this mean your battery will be ready for use when you need it most, but you will also maximise the life of your battery.

If the battery is not maintained by an alternator (such as in a vehicle) the battery charger recommended would be of a "constant current" type.

### Four simple rules for maximum battery performance:

1. Keep a record of the times you have used your battery and which applications you have used the battery for.
2. The further the battery is discharged, the longer the recharging time necessary to return it to full capacity.
3. When recharging your battery, add a 20% safety margin to the calculated recharging time to ensure full battery capacity is maintained.
4. Follow the instructions on your battery charger for the correct procedure to follow to maintain optimum charge levels.

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