

# marine

## batteries

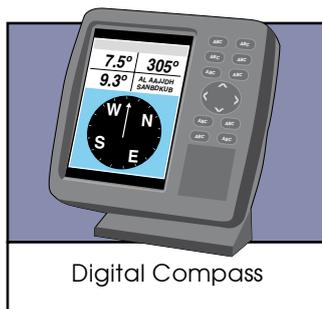
starting power with extra reserve capacity



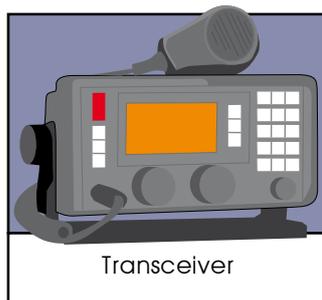
# Why choose a marine battery?

Marine batteries can provide starting power as well as sustained power over extended periods of time.

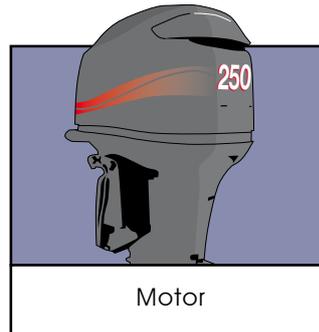
*Choose a marine battery when you require extended power for on-board accessories with the added peace of mind that your boat will bring you home safely – time after time.*



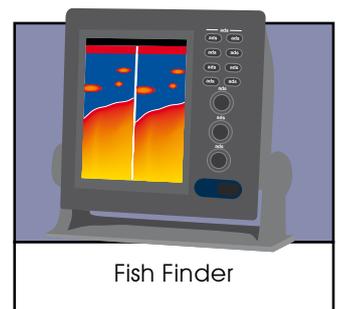
Digital Compass



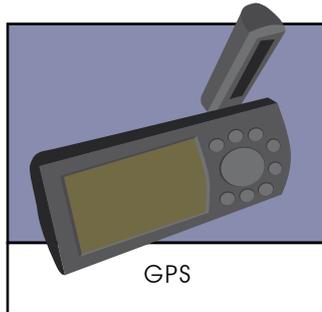
Transceiver



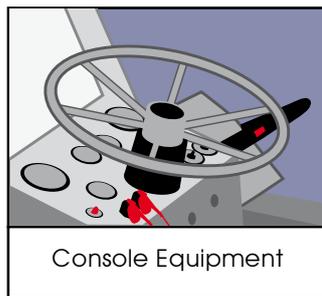
Motor



Fish Finder



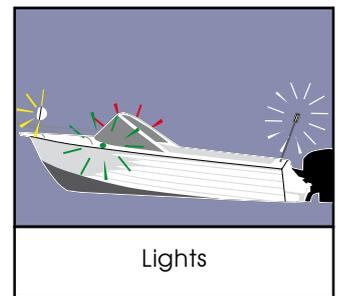
GPS



Console Equipment



2-Way Radio



Lights

## Car batteries vs Marine batteries

### Car batteries

To understand why you should use a marine battery for boating applications, we can compare a marine battery with a standard car battery.

Cars require batteries that provide a high burst of power for a short time, just long enough to start the 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 reliable in providing longer periods of power while the engine is turned off and the alternator is not charging.

### Marine batteries

The main requirement of a marine battery on a boat is to start the boat's engine. However, unlike car batteries, marine batteries are also commonly required to deliver constant power draw when the engine is switched off.

Generally when a car engine is turned off, the vehicle's electrical accessories are no longer in use, or are used for a very short time only. On a boat, when the engine is turned off there is usually a number of on-board accessories operating at once, for extended periods of time.

Accessories such as a fish sounder, GPS unit, marine radio and even a stereo system may all be operating while the boat is idle, constantly running down the battery's power. Marine batteries therefore need to provide this constant (deep cycling) power without compromising on the ability to start the boat's engine.

Furthermore, marine batteries are normally manufactured with stronger components to resist wear and tear caused by use on the water. Good quality marine batteries are constructed so the lead plates inside are bound securely together to withstand the rigours of constant wave pounding and vibration.



## Choosing the right battery

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Marine batteries can provide either starting power only, or a combination of starting power and cycling (extended) power capabilities. The latter are commonly referred to as Dual Purpose Batteries.

Batteries are designed for specific applications and power demands. When selecting a marine battery, you need to work out the power required for engine starting as well as the amount of power your on-board electrical accessories will use. This is important to ensure your battery provides adequate capacity.

Once you have determined your power requirements, you can refer to product specifications to select the battery that will deliver the required capacity. Depending on your boat and power requirements, this selection could be a single battery, multiple batteries connected in parallel, or a Dual Battery System. When deciding if a multiple battery setup is required, it is important to ask the advice of a qualified marine electrician.

Depending on your power requirements, or if your requirement for extended (cycling) power varies significantly, consideration should be given to a Dual Battery System. The marine battery provides starting power while a deep cycle battery powers your on-board accessories.

For more information on deep cycle batteries, please refer to CenturyYuasa's Deep Cycle Batteries brochure.

## Dual Battery Systems:

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### The importance of isolation.

The capability of isolating the starting battery is essential to ensure it is always charged and ready to start your engine on demand, particularly in marine applications where safety issues become a major concern if your boat fails to start on the water. Battery isolators configure the charging of your batteries and ensure they are separated when the engine is turned off.

If you simply connect the batteries in parallel for charging, there is a chance of running both your starting and auxiliary batteries flat. Depending on your power requirements, there are four types of automatic battery isolator systems:

### 1. Manual Selection

A manual switch is the most common and simplest to use system to isolate your batteries. Battery load and charging options are controlled by toggling a mechanical switch, allowing current flow from each individual battery, or from both batteries at once.

### 2. Solenoid Isolator

This is the most basic automatic system, where a solenoid acts as an automatic switch. Once the ignition is engaged, the solenoid connects the starting and auxiliary batteries in parallel, effectively creating one big battery. The batteries are charged together when the engine is running and the solenoid isolates them when the engine is switched off. If the starting battery runs flat, the engine can still be started using the auxiliary battery.

### 3. Diode Isolator

The diode isolator acts as a one-way valve between the batteries, preventing current from flowing from one to the other. Each battery is isolated and acts as an independent power source, which means the engine's alternator can recharge each battery according to its individual needs. When the auxiliary battery is low on charge or flat, the starting battery will remain in a fully charged state.

### 4. Electronic Isolator

The most advanced system, the electronic isolator, constantly monitors voltage in the starting battery, automatically giving it priority during charging. Once the voltage of the starting battery reaches a predetermined level, the system directs all voltage to the auxiliary battery. This ensures there is always enough starting power and also shortens the charging time for the auxiliary battery. During charging, the starting battery is always given priority. Only when the starting battery is fully charged does the auxiliary battery begin charging.

### Talk to an expert

As you can see, fitting a dual battery system to your boat is far more complex than just fitting a second battery. The advice of a qualified marine electrician is essential.



## Get maximum life from your battery:

If a boat is stationary on the water for an extended period of time while using on-board accessories, then started and driven a relatively short distance, the engine's alternator will not always recharge the battery to its original capacity.

The following are some common facts and rules on battery care and charging:

- As a rule of thumb for charging it will take 8 to 10 hours to recharge a typical flat marine battery using a 10 amp constant voltage charger.
- Self discharging does occur with marine batteries. A battery left standing for 2 months will require recharging. Higher ambient temperatures accelerate the rate of self discharge. Make sure you charge your battery before venturing out on the water.
- A marine battery will require recharging when the specific gravity drops to 1.200 at 25 °C, or the open circuit voltage falls to 12.40V.
- Most battery users will have a constant voltage charger for battery maintenance. Generally, a simple 10 amp charger will be adequate for batteries up to N70 size batteries. For charging larger batteries and deep cycle batteries, the minimum requirement is a 20 amp constant voltage charger. This is due to a higher internal resistance, particularly with deep cycle batteries.
- It is important that you don't leave your batteries in a state of discharge for any length of time. Leaving a battery in a discharged state can lead to permanent loss of part of its capacity.

## Playing it safe:

Maritime safety authorities have expressed concern at the growing number of mechanical breakdowns caused by flat or failed batteries.

Alarming, many instances of mechanical failure occur because a car battery was used as an interim measure on the day of the boat trip, or an inferior battery type was used which failed prematurely.

Avoid becoming a maritime statistic. Play it safe by ensuring you use a quality marine battery which provides adequate capacity for your boating requirements, before you set out on the water!

## Using solar energy:

When your boat's engine is switched off, an on-board solar panel can charge the battery while power is being consumed by your accessories.

A regulator can be installed to prevent the solar panel from over-charging and damaging the battery. The regulator can also prevent the battery from discharging too much, thereby avoiding battery damage and reduced service life.

There are many issues you should consider when installing a solar system, such as the type of panels to use and how to position them correctly. You will need to seek expert advice before installing such a system to ensure adequate battery capacity and solar arrays for your power requirements.

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