World Focus 1412 CC: Reg No: 2007 / 000484 / 23.
B1 Stellenhof, Voortrekker Rd. Ph: 021 851 7713.
Somerset West. Fax: 086 502 2249.
7130. E-mail: info@solarflex.co.za.

Basic Battery Info.

The most common battery rating is the AMP-HOUR RATING.
This is a unit of measurement for battery capacity, obtained by multiplying a current flow in amperes by the time in hours of discharge.
(Example: A battery which delivers 5 amperes for 20 hours delivers 100 ampere hours.)
Rating has little significance unless qualified by the number of hours the battery is discharged.
For this reason Amp-Hour Ratings are only a general method of evaluating a battery's capacity for selection purposes.
The quality of internal components and technical construction within the battery will generate different characteristics without affecting its Amp-Hour Rating. The ratings must be examined in order to evaluate and select the proper battery for a specific application.

CYCLE LIFE

One cycle of a battery is a discharge from full charge to full discharge and a return to full charge again.
The total number of cycles a battery can perform before failure is called its Cycle Life.

DEEP CYCLE BATTERIES

To explain this, one must understand that any battery may be termed deep cycle as all batteries may be fully discharged and charged.
However, a true deep cycle battery is capable of thousands of hard cycles during its life without losing its capacity.

INCREASING CAPACITY THROUGH SERIES AND PARALLEL CONNECTIONS

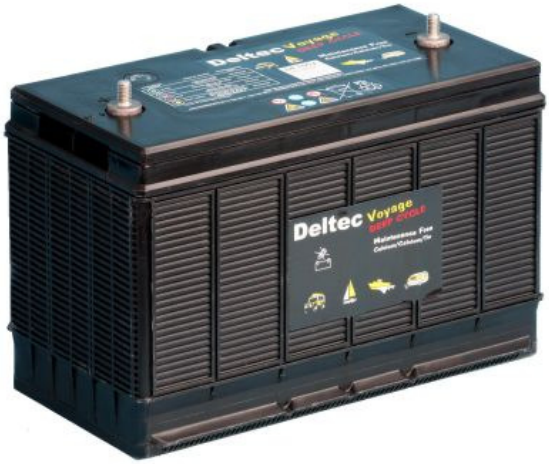
In the SERIES CONNECTION, batteries of like voltage and Amp-Hour capacity are connected to increase the Voltage of the bank. The positive terminal of the first battery is connected to the negative terminal of the second battery and so on, until the desired voltage is reached. The final Voltage is the sum of all battery voltages added together while the final Amp-Hours remains unchanged.
In the PARALLEL CONNECTION, batteries of like voltages and capacities are connected to increase the capacity of the bank. The positive terminals of all batteries are connected together, and all negative terminals are connected in the same manner. The final voltage remains unchanged while Amp-Hours increases

BATTERY MAINTENANCE

OVERCHARGING is the most destructive element in battery service.
OVERDISCHARGING is a problem which originates from insufficient battery capacity causing the batteries to be overworked. Discharges deeper than 50% can significantly shorten the Cycle Life of a battery.

World Focus 1412 CC: Reg No: 2007 / 000484 / 23.
B1 Stellenhof, Voortrekker Rd. Ph: 021 851 7713.
Somerset West. Fax: 086 502 2249.
7130. E-mail: info@solarflex.co.za.

Larger @ 105amp Hour batteries suitable for the caravan or camping excursions to provide power for the lights and fridges on camping trips.



Deep cycle battery with screw type connectors.

Smaller 7amp Hour batteries for gates and small devices not requiring a lot of power.

There are many types of batteries available, the Wikipedia website has a lot of information with regards to the different types available.
https://en.wikipedia.org/wiki/List_of_battery_types

World Focus 1412 CC: Reg No: 2007 / 000484 / 23.
B1 Stellenhof, Voortrekker Rd. Ph: 021 851 7713.
Somerset West. Fax: 086 502 2249.
7130. E-mail: info@solarflex.co.za.

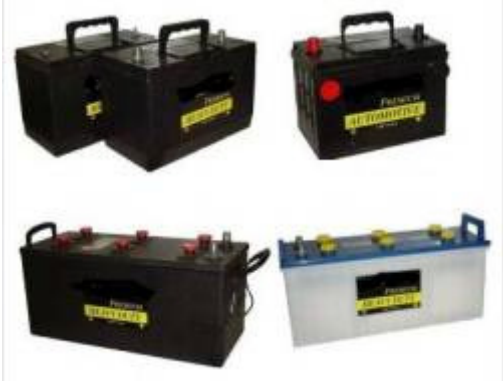
12 Volt Batteries for Camping

If you are camping away from mains power then a good battery and charging set-up is essential. Many people simply do nothing more than use the battery provided in their caravan/RV/camper trailer with little understanding of the characteristics of the battery – how much power can it deliver and for how long.

A worst case scenario sees a battery becoming fully discharged with a high chance of irreparable damage being done to it. This article will hopefully provide some useful information on batteries, their use and care.

First off, different battery types.

There are three main battery types that I will address here, **wet cell starter batteries**, **deep cycle**, and a variation on deep cycle that is **AGM**. It is important to appreciate the differences because they are all made for a specific purpose.



The starter battery is one that we are all familiar with under the bonnet of our vehicle. This type of battery is used to provide very heavy currents to a starter motor for short time periods. Because of this requirement, and thus its construction, it should not be deep cycled as its lifetime will be shortened as the plates will deteriorate rapidly.

A deep cycle battery is one that is NOT designed for short heavy loads but IS designed for the occasional discharge below the 50% threshold (a rule of thumb is that batteries should not be discharged below about 50% of their capacity if you want to get a reasonable life out of them). Deep cycle batteries can be wet cell, but tend to be constructed with the electrolyte more of a gel so that the battery can be "sealed". Sometimes they are called "maintenance free", but what this means really is that you CANNOT maintain them because of the sealed nature. In reality, wet cell deep cycle batteries are better in hotter climates because at least you can test the cells and top the electrolyte up with a regular maintenance pattern. Most batteries perform better in colder climates.

World Focus 1412 CC: Reg No: 2007 / 000484 / 23.
B1 Stellenhof, Voortrekker Rd. Ph: 021 851 7713.
Somerset West. Fax: 086 502 2249.
7130. E-mail: info@solarflex.co.za.

AGM (Absorbed Glass Mat) batteries in my opinion are the best choice for camping. Yes they are more expensive, but for the advantages they offer it is worth it. An AGM battery can tolerate the occasional discharge below the 50% level – some people even say down to 20%, but personally I wouldn't do that. You see batteries LOVE to be charged. They HATE being discharged, and regular excessive discharge is where the damage can be done. AGM batteries tend to charge faster and take more charge, up to close on 100% of charge (did you know that your car alternator is only capable of charging your vehicle battery to around 70-80%?). Because AGM batteries were developed for the military they can take the punishment too. Their sealed nature means that you do not have to vent these batteries to the outside. You can store these batteries inside your car or caravan and even store them on their sides if you have to, and if you leave an AGM battery in storage, unattended for an extended period you can recharge it again without any deterioration or loss of efficiency.

Lifetime of a standard cranking battery is generally up to 4 years
Lifetime of a deep cycle battery is generally up to 6 to 8 years
Lifetime of an AGM battery is up to 10 years

Now of course all this depends on how the battery is used (or abused) and is a general assumed figure if the battery is well cared for. The more you look after your battery the longer the life.

The capacity of a battery is usually given in terms of Ampere hours. The best way to explain this is as follows:

You have a 100 Ampere hour battery and you are going to run just one light taking 1 amp from the battery.

In the utopian world that light will remain on for 100 hours. However, remember the 50% rule – the battery will best be protected if you run the light for only 50 hours. If you want to calculate the length of stay your battery will reliably sustain you for you need to list all your appliances, their current draw and how long they are used each day. For example if you use two lights drawing 1 amp each for 3 hours per day then your drain is 2×3 = 6 ampere hours.

Then compare your calculations against your battery capacity. As an example, if I work out that all my appliances require 20 ampere hours each day and I have a 120 ampere hour battery then I should be OK for three days. If I have an AGM battery, maybe a little bit longer. Personally I have two 120 ampere hour AGM batteries connected in parallel so I know I have at least 120 ampere hours (the 50% rule), with a bit in reserve. I have tested this on site for three days and used lights, radio, water pump, TV, and experienced no problems at all. I might add here that I also employ a battery voltage monitor to see the state of charge at a glance.

World Focus 1412 CC: Reg No: 2007 / 000484 / 23.
B1 Stellenhof, Voortrekker Rd. Ph: 021 851 7713.
Somerset West. Fax: 086 502 2249.
7130. E-mail: info@solarflex.co.za.

Charging your battery(s). If you have spent good money on quality batteries then please spend a bit more on a quality charger, and the best type is a smart multi-stage charger that will not only charge your battery faster and to a higher charge, but will also ensure a longer battery life with more capacity than if it was charged with one of the constant voltage chargers.

If you do use more than one battery, when you connect then together, make sure you use properly sized cable. This is a common mistake made by many people – undersizing the wiring, and then they wonder why their batteries are not delivering. Remember, the smaller gauge the wire, the more voltage loss; and the longer the run, the more voltage loss again.

The following is a brief look at the major battery types for smaller devices.

Nickel Cadmium (NiCd) — mature and well understood but relatively low in energy density. The NiCd is used where long life, high discharge rate and economical price are important. Main applications are two-way radios, biomedical equipment, professional video cameras and power tools. The NiCd contains toxic metals and is environmentally unfriendly.

Nickel-Metal Hydride (NiMH) — has a higher energy density compared to the NiCd at the expense of reduced cycle life. NiMH contains no toxic metals. Applications include mobile phones and laptop computers.

Lead Acid — most economical for larger power applications where weight is of little concern. The lead acid battery is the preferred choice for hospital equipment, wheelchairs, emergency lighting and UPS systems.

Lithium Ion (Li-ion) — fastest growing battery system. Li-ion is used where high-energy density and lightweight is of prime importance. The technology is fragile and a protection circuit is required to assure safety. Applications include notebook computers and cellular phones.

Lithium Ion Polymer (Li-ion polymer) — offers the attributes of the Li-ion in ultra-slim geometry and simplified packaging. Main applications are mobile phones.