rspro.com

BATTERIES

PRODUCT RANGE GUIDE

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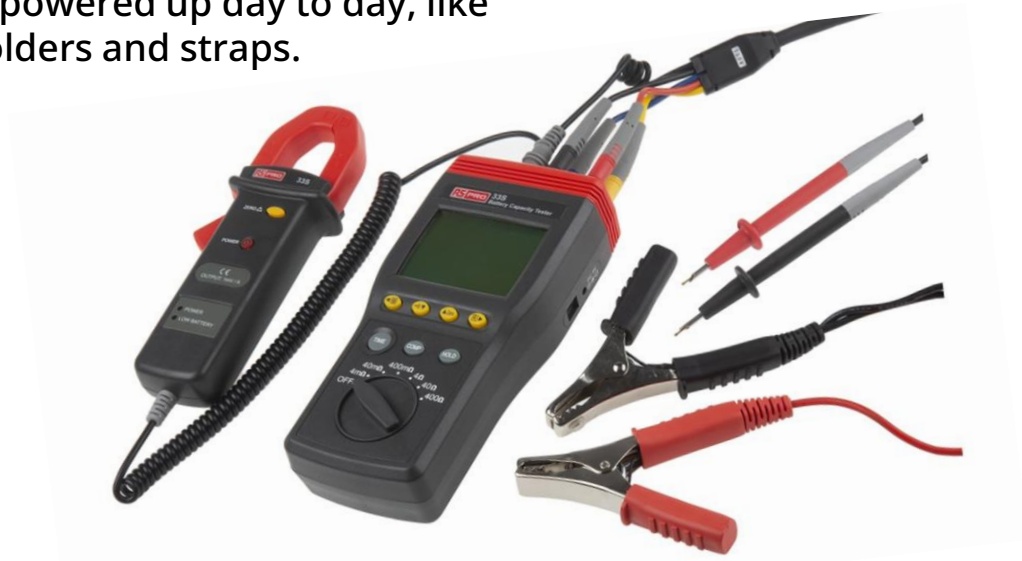
WITH A BATTERY LINE UP LIKE THIS, WHY GO ELSEWHERE?

Our own brand, RS Pro, has the range and quality you need to stay at peak performance, no matter what your business demands.

From alkaline to lithium, lead acid to rechargeable and more, RS Pro stocks a full range of batteries including a budget-friendly line of battery packs, ready to order.

Need to recharge? We also have the accessories to keep you powered up day to day, like chargers, holders and straps.



How Batteries Work

A battery works by converting chemical energy into electrical energy. A chemical reaction inside the battery or cell, causes one end to become negatively charged and the other positively charged. This difference in charge, known as potential difference, causes electrons to flow around the circuit that the battery is connected to.
A battery consists of two different conducting metals and an electrolyte - a liquid or dry powder that can conduct electricity. When the two electrodes of the battery are connected in a circuit, a chemical reaction takes place. Positive ions are attracted to the negative electrode (cathode) and negative ions are attracted to the positive electrode (anode). The negative electrons in the wires of the circuit are pushed around the circuit by this difference in charge, transferring energy to the other components in the circuit.
The voltage of a battery refers to the difference in charge (potential difference) between the two ends of the battery. The higher the voltage, the more current is pushed around the circuit which means more energy is transferred.

How Long Do Batteries Last?

The lifetime of a battery depends on the rating and the power of the device it is being used in. Batteries are rated in milliampere-hours (mAh). A battery with a rating of 2000 mAh can deliver a consistent current of 2000 mA for one hour, or 1000 mA for two hours, and so on. The actual current produced will depend on the device being used.
Most AA and AAA batteries have a capacity of 2000–3000 mAh. In low-power devices such as an LED torch, this could last around ten hours. In higher-power devices, the battery will run out much more quickly.
Batteries can be stored, unused, for 10 years without compromising their performance, provided they are stored correctly.

How to Store Batteries

Batteries should be stored in their original packaging, at room temperature or below. Avoid storing batteries in humid conditions or direct sunlight. If the terminals of the batteries come into contact with each other or metal objects, they can discharge.
Older batteries can occasionally leak. The chemicals leaking from a battery are harmful to humans. If a battery is leaking, dispose of it immediately, without touching it and wash your hands straight away. Remember to clean up any residue left behind.

Where to Dispose of Batteries

Batteries should not be disposed of with normal rubbish that is headed to landfill as their chemical contents can enter the ecosystem. Ideally, recycle your batteries so that they can be disposed of in a way which minimises the effect on the environment. Never throw batteries into a fire, as they can leak or break open.

How to Recycle Batteries

Batteries can be recycled by depositing them at a dedicated collection point. Check your local recycling centre along with many supermarkets and DIY stores which have battery recycling bins. Recycling batteries is important to prevent harmful chemicals from entering the environment and to avoid waste of valuable raw materials that can be used again.
Battery recycling facilities use physical or chemical processes to separate the metals from the discharged battery so that they can be used in the production of new products.

RS Pro Battery Compliance

Every RS Pro battery product is required by law to have a technical file available on request without delay. We ensure that this technical file is complete and compliant which enables us and our customers to reliably transport these products by land, sea, and air.
We cycle the battery packs through a series of charging and discharging cycles while monitoring the temperature of the battery pack and the battery management system (BMS). All battery packs and their BMS's are analysed to ensure they are RoHS compliant.

Lithium Batteries are classified as Dangerous Goods and are the most tightly regulated of all Battery chemistries. All Lithium Batteries require a UN38.3 Test Report which demonstrates that the Battery has passed all the requisite tests and is safe for use. It is also used to determine whether any transportations restrictions apply.

Ethical Sourcing

In 2023, the EU voted to introduce Regulation 2023/1542 on Batteries and Waste Batteries. The overall goal is to make batteries sustainable throughout their lifecycle. This repeals the previous battery directive (2006/66/EC).

This new regulation now means that any battery type (portable/LMT/SLI etc) will need to be physically CE marked or alternatively on the packaging label where not possible due to battery size (coin cells).
This also applies to batteries contained within equipment e.g a multi-meter with an internal lithium battery, the battery will need to individually be CE marked as well as the device itself.

The CE marking acts as a digital product passport with the key benefits listed below:
- **Promoting sustainability in battery production and minimizing environmental impact across their lifecycle.**
- **Encouraging circularity by providing data for second-life usage and enhancing recycling in terms of both quality and quantity.**
- **Ensuring safety by protecting human health and the environment.**
- **Improving transparency and providing consumers with information on the environmental and safety performance of batteries.**

Any new stock arriving into RS from the 18th August 2024 will comply with the above regulation.

Different Types of Batteries

There are three different types of batteries that are commonly used - Alkaline, Nickel Metal Hydride (NiMH), and Lithium Ion. The use of different metals and electrolytes in these batteries gives them different properties which means they are suited to different contexts.

Alkaline batteries are the most popular type of single-use battery. The cheapest category of battery, these non-rechargeable batteries maintain a consistent discharge throughout their lifetime, leading to reliable performance. While convenient, the disposable nature of alkaline batteries means that they are not an environmentally friendly option.

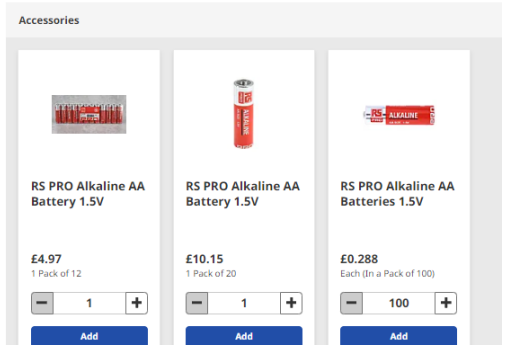
Lithium Ion batteries are a newer development in rechargeable batteries and have become commonly used in laptops and phones. More expensive than NiMH at the point of purchase, the number of possible recharges means that they will save money over time. Quick charging and more consistent power output throughout their lifetime also contributes to the popularity of lithium batteries.

NiMH batteries were the first rechargeable batteries to be developed, used every day in various household and industrial items. These batteries have two to three times more capacity than a nickel-cadmium cell (NiCd) battery and if stored in a cool, dry place can last for between 500 to 1000 charges or 2 to 3 years. The more you charge NiMH, the longer they last.

Different Sizes of Batteries

The different sizes of batteries are based on the device in which they are being used, both in terms of physical size and the power required. Rechargeable batteries in consumer electronic products are designed with the size and shape of the specific device in mind. Replaceable batteries are usually cylindrical and come in sizes named AAA, AA, C and D.

AA batteries are the most commonly used type of battery worldwide and are probably the first thing that comes to mind when you hear the word battery. AAA batteries are a thinner and shorter version of AA. C batteries and D batteries get progressively larger. All these batteries are usually 1.5V, the larger battery size offering a longer lifetime. If more than 1.5V is required, then multiple batteries are used together.
9V batteries are cuboid-shaped with both terminals on the top of the battery. Button-shaped batteries are used in small devices that do not require a high power output, such as watches or kitchen scales.



All products within the RS range that contain AA or AAA lithium batteries now include an accessory link on our website

Rechargeable Batteries

Rechargeable batteries (secondary cells) use the same basic chemical reactions as disposable batteries (primary cells) but have different electrode and electrolyte material properties. Examples include lithium-ion batteries and nickel-cadmium ones. These materials facilitate a reversible chemical reaction rather than the irreversible one seen in primary cells. With an electric load source applied to the battery, ions flow the other way within the electrolyte and replenish the battery energy storage system — or initially fill it, since secondary cells are not usually pre-charged.
These batteries are more complex and sophisticated, heavy and expensive, but have widespread practical use, as seen in all our everyday devices with batteries that allow repeatable energy replenishment: smartphones, laptops, gaming controllers, sport watches, and more. These energy storage technologies are also becoming increasingly important for renewable energy storage.

Lead Acid Batteries

Powerful, reliable and robust, lead acid batteries are relied upon as a backup power source in many different applications. The reliability, long lifetime and effective power supply of lead acid batteries make them a common choice for a range of applications, including:

- Vehicle ignition power sources
- Backup for infrastructure, including emergency lighting or alarms
- Renewable energy storage and backup
- Powering electric motors
- Emergency power supplies in critical uses, such as in submarines

Though the chemical reactions and processes within each type of lead acid battery are similar, the exact design of each type of lead acid battery varies to suit different applications and requirements. All of the RS Pro lead acid batteries are Sealed, this is a name given to any type of battery that has closed cells. AGM and gel lead acid batteries both fall into this category. This type is typically chosen because of its greater safety, ease of transport and flexibility in terms of applications.

- Gel lead acid batteries: in these types of sealed lead batteries, the electrolyte is in gel or silica form. This means it's not as free moving as in flooded batteries, making it safer to handle and dispose of. It also makes this type of battery more appropriate for lower-voltage applications. Due to this, those using gel lead acid batteries also need to be careful not to overcharge them.
- Absorbed glass mat (AGM): the electrolyte in these sealed lead acid batteries is being held in place by fibreglass mats. This makes these batteries safer to move and dispose of, as well as more resistant to low temperatures and high vibrations. Because the liquid isn't free flowing in the battery, the resistance is also lower, meaning faster charging, though it's important to be careful not to overcharge

Battery Chargers

Battery chargers and power banks are both used to refill depleted sources of energy for rechargeable batteries by running a power source through them. Due to the wide range of battery types and chemistries available, there are an equal numbers or charger types within our RS Pro offer so that no matter the requirements we have a solution to keep your devices running.

A typical rechargeable battery can be charged many times and typically they last 3-4 years. Battery chargers are a genius way of keeping our Planet green and will save you a substantial amount of money. Technology increases battery life and power but how well your battery performs depends on how they are used and how long they were charged for. Having this in mind, a decent battery charger is as important as the batteries we put into it.

Guidelines when buying a battery charger:
•Use a compatible charger – the battery voltage needs to agree with the battery charger
•A lead-acid charger should switch to float charge when fully saturated; a nickel-based charger must switch to trickle charge when full. Li-ion cannot absorb overcharge and receives no trickle charge.
•The Ah rating of a battery can be marginally different than specified, we should not charge if the Ah rating deviates more than 25%
•Chargers should have a temperature override to end charge on a faulty battery.
•Battery chargers should be supervised in use and if warm, the battery should be removed
•The best results can be achieved charging at room temperature as charge acceptance drops when cold

What is a Battery Tester?

Battery testers are electronic devices designed to test the remaining capacity of a battery's overall charge. Contrary to popular belief, they do not test the voltage – simply the remaining capacity.
Every battery has a direct current. Battery testers work by applying a load and monitoring the voltage response of the battery. This enables the device to identify how much power is left in the battery.
Ideal for both monitoring and troubleshooting, battery testers are used across a broad spectrum of applications and industries, including:

- Industrial maintenance
- Automotive
- Facility maintenance
- Electrical
- Test and measurement
- DIY and domestic purposes

Simple and easy to use, these devices provide quick, straightforward results and are a staple battery charger accessory for professionals and DIY enthusiasts alike. Battery testers may also be known as voltage meters.

What is a Battery Holder?

A battery holder is most commonly sold as an integral or removable compartment or cavity, designed to be inserted into or attached onto, a suitable item of cell-powered equipment.
The primary function of a battery holder is to keep cells fixed in place safely and securely while conveying power from the batteries to the device in question. External connections on battery holders are most often made by contacts either with pins, surface mount feet, soldered lugs or via a set of wire leads.
Battery holders are often designed to be incorporated within the body of an electrical item, but they're also frequently sold as external compartments or attachments. Either way, some of the most important factors to consider when choosing an appropriate battery holder for a given application will be:

- Battery size
- Compatible cell types
- Contact/terminal style
- Battery mounting and insertion method
- Unit size and shape
- Battery holder cover and housing design

Other accessory types include battery contacts, battery maintenance and jump leads.