

Introduction

Batteries are a big part of today's portable lifestyle. They power our flashlights, laptops, testing equipment and recreational equipment. In the battery market today shoppers are faced with many choices. Batteries come in different sizes, shapes and chemical systems. What type of battery should I buy to power my flashlight?

Definition of a Battery

A battery is a portable energy source that is made up of six key components—an anode, a cathode, an electrolyte, a separator, a can, and a seal.

These four components can be made up of many different materials and combined in an almost endless array of sizes and shapes. The choice of materials used, and the quality, grade and density of these materials will play a major role in determining the energy levels and performance of batteries.

Battery History







Primary batteries were first made in the mid-1800's. These early batteries were known as zinc carbon. Zinc carbon technology is still around but it has been updated with purer, quality grade materials and a different electrolyte. This formulation is now called zinc chloride (heavy duty).

Today, most consumers choose alkaline manganese batteries. These batteries provide a much higher energy output, which is needed for the fast growing demand for portable power. Rayovac® has played an important role in this battery history. Founded in 1906, Rayovac® is

an international manufacturer and marketer of a full line of consumer batteries.

What's in a battery and how does it work?

A battery is constructed of six key components:

-  **Anode:** The negative portion of the battery (gel); the electrode that gives off electrons as the battery is charged.
-  **Cathode:** The positive portion of the battery (mix); the electrode that receives electrons as the battery is charged.
-  **Electrolyte:** The electrolyte is a liquid solution that aids the flow of energy.
-  **Separator:** The separator is used to prevent a short circuit; it separates the anode and cathode and keeps them from touching one another.
-  **Can:** The can holds the contents of the battery, and provides direct electrical contact with the cathode.
-  **Seal:** The seal (gasket, sealant) prevents the battery from leaking and insures a long shelf life.

Batteries create an electric current by using the stored-up energy in chemicals (anode and cathode) and changing it to electrical energy. To harness power and work correctly a battery needs the four main components previously identified. When a battery is inserted into a device it completes a loop which allows electrons to flow around the circuit.

How long do batteries last?


The duration of a battery is defined in one of two ways:


Hours and minutes: The length of time the cell runs on a particular test.


Ampere (milliampere) Hours: The rate of flow in amperage multiplied by the time it ran.


The life of a battery depends on two factors, the chemical make-up of the battery and how much drain that device puts on the battery.

Different Types of Batteries and Battery Uses:

 **Heavy Duty Batteries:** Heavy duty batteries, also known as zinc chloride, are the result in advances in zinc carbon technology. They are very popular battery types that have been around many years. Heavy duty batteries are the best value for medium to low drain devices used infrequently such as AM/FM radios, clocks, flashlights, smoke alarms and remote controls.

 **Alkaline Batteries:** Alkaline batteries are the most popular battery used today. Alkaline will last significantly longer than heavy duty batteries. They get their long life from unique construction and the purity of the materials used. Alkaline batteries are best suited for high drain devices.

 **Rechargeable Alkaline Batteries:** Reusable alkaline batteries are specially designed for use 25 times or more when charged properly. Rechargeable alkaline batteries come fully charged, have no memory problems, up to five-year shelf life and will last up to three times longer than a fully charged nickel cadmium rechargeable battery.

 **Rechargeable NiMH Batteries:** Rechargeable Nickel Metal Hydride (NiMH) batteries are the latest break through in rechargeable technology. These batteries offer capacities up to 30% higher per charge than NiCd batteries of the same size. NiMH batteries can be recharged without having to be fully drained and can be charged up to 1000 times. NiMH work best in high drain devices that chew through alkaline batteries quickly such as digital cameras.