

# Recycling Batteries

In our increasingly mobile world, batteries serve quite a purpose. They power our cars, portable electronics and items we use every day. Batteries can even be made out of vegetables.

Batteries are identified by the product they're used for ("car battery," "cell phone battery," etc.) or their size ("9V", "button cell"). But for scientific purposes, batteries' names are based on the metals they contain. Concerning disposal, the name can be helpful because it lets you know what elements are wrapped up in that cylindrical packaging.

Battery recycling is not a matter of possibility. It comes down to the efforts you're willing to take. Availability will also depend on where you live, as some countries have designated all batteries as hazardous waste and require that they be recycled or taken to a household hazardous waste (HHW) collection facility.

1. Rechargeable batteries last considerably longer than single-use batteries, so using them means fewer batteries for disposal.
2. All batteries have a finite life span, but there are steps you can take to prolong the life of your batteries.

## Alkaline Manganese Batteries



Alkaline Magnesium batteries are found in a lot of household items. Photo: Pophoto.com

**Where It's At:** Alkaline batteries are used in everything from cameras and flashlights to remote controls.

**What to Do:** If you talk to your local solid waste department, you may be instructed to put alkaline batteries in with your regular trash. This is partly due to the Mercury-Containing and Rechargeable Battery Management Act passed in 1996 that phased out the use of mercury in alkaline batteries, making them less of an issue when disposed in landfills. But this doesn't mean alkalines are not recyclable.

If you're unable to find a local recycling option, you can consider mail-in recycling programs. They are also accepted for recycling at all Batteries Plus locations.

If you do decide to put alkaline batteries in the trash, as in most cases this is legal, you can take extra steps to prevent leaking such as:

1. Putting multiple batteries in the same plastic bag
2. Securing the ends of each battery with masking tape

**End Result:** Recycling these batteries can recover steel and zinc, two valuable metals. In the case of steel, it can be reprocessed into rebar.

## Nickel-Cadmium (Ni-Cd) Batteries



Ni-Cd batteries are the inexpensive rechargeable form of alkaline batteries. Photo: Seephar.com

**Where It's At:** Ni-Cd batteries are the inexpensive rechargeable form of alkaline batteries. They can be recharged hundreds of times to avoid disposing of batteries and are, for the most, part interchangeable with alkalines.

A cadmium-free alternative to these batteries is Nickel Metal Hydride (NiMH), which you'll now find more often with name brands of rechargeable batteries.

**What to Do:** One little known fact about Ni-Cd batteries is that part of the built-in price is to cover proper disposal. Due to the presence of the toxic metal cadmium, these batteries are considered hazardous waste and are not allowed in landfills.

In 1994, the rechargeable battery industry formed the Rechargeable Battery Recycling Corporation (RBRC), which provides collection locations for both Ni-Cd and Ni-MH batteries in thousands of retail stores and public agencies.

**End Result:** In the case of both batteries, recycling involves using heat to separate the high temperature metals, such as nickel and iron, from the low temperature ones, like zinc and cadmium. Some of the metals solidify after they melt, while others are reprocessed as metal oxides. These metals all have value.

## Lithium-Ion (Li-ion) Batteries



The Li-ion battery is commonly found in cellular phones and consumer electronics. Photo: Tech2.in.com

**Where It's At:** One of the newest forms of rechargeable technology is the Li-ion battery, which is commonly found in cellular phones and consumer electronics. These batteries are also being introduced as the power source for electric vehicles.

**What to Do:** It's likely that you'll be disposing a Li-ion battery along with an electronic device, such as upgrading a cell phone or selling a laptop. In most cases, the company that handles your electronic device will accept the battery as well. The RBRC program also covers these batteries, so finding recycling locations should not be a challenge.

**End Result:** These batteries are recycled in the same way as Ni-Cd batteries and produce valuable metals.

One reason to not store Li-ion batteries or put them in a landfill is that they have the potential to overheat and explode when exposed to hot temperatures. If you're starting a collection of these batteries before you recycle them, it's a good idea to store them in a cool location.

## Silver Oxide Batteries



Also called the button cell battery, the Silver Oxide battery is found in items such as hearing aids and wristwatches. Photo: Gpmd.com

**Where It's At:** This is the more common form of the button cell battery, which you'll usually find in calculators, hearing aids and wristwatches. In addition to their small size, button cells are known for a long storage life and the ability to work well in low temperatures.

**What to Do:** Silver oxide and other button cell batteries also contain mercury, which makes recycling a must. Luckily, you'll have fewer button cells to recycle since they aren't as common and last longer.

In many cases, a professional will replace these batteries, so ask the business if it will recycle the battery for you. If not, often times these batteries are accepted as part of household hazardous waste programs sponsored by your municipality. Button cells

have an alphanumeric code, and the first letter indicates what type you have ("L" for manganese dioxide, "S" for silver oxide).

**End Result:** Silver oxide batteries are typically shredded during the recycling process to recover the valuable heavy metals.

## Lead-Acid Batteries



Lead Acid batteries are found in automotive units.  
Photo: Handymanlynness.com

**Where It's At:** These are the batteries that primarily power automotive units, such as cars, boats, golf carts, motorcycles and even lawn mowers.

**What to Do:** Just keep doing what you're probably already doing. Lead-acid batteries have a 97 percent recycling rate, the highest of any consumer product in the U.S., which is good because they're one of the most harmful products in a landfill with a mixture of lead and sulfuric acid.

If you buy a new car battery, ask about recycling options for the old one when it's installed. You can also participate in the AAA-sponsored Great Battery Roundup, which takes place every year in April.

**End Result:** Lead-acid batteries are recycled by separating the battery into its three main components: Plastic, lead and sulfuric acid.

- The polypropylene plastic is reprocessed into new battery cases
- Lead pieces are cleaned and also reprocessed for use in new batteries
- The battery acid is either neutralized and then sent through a waste water treatment plant to be cleaned for human consumption, or it's converted into sodium sulfate that's used in laundry detergent

## The Rest

If you have other types of batteries, the first step is determining what chemicals they contain, which will tell you if they are classified as hazardous waste. The presence of cadmium, lead or mercury will indicate that you're dealing with HHW.

***Polyurethane products are often called "urethanes". They should not be confused with the specific substance urethane, also known as ethyl carbamate. Polyurethanes are not produced from ethyl carbamate, nor do they contain it.***