

# All About Batteries

## Household Batteries

Household batteries are separated into two main types—**rechargeable** and **non-rechargeable** (the latter referred to as “single-use” or “primary”). To get the most out of your batteries

- avoid pairing different types or brands of batteries;
- remove batteries from devices when not in use;
- dry cell batteries, especially single-use batteries left in a device, may “leak,” depositing a salt-like substance on a device’s contacts that can be corrosive and should be handled with care. (See below for deposit protection and removal.)
- store household batteries in original packaging, in a cool, dry location in a plastic or cardboard container.

## Primary or Single-use Non-rechargeable Batteries

Primary or single-use batteries are made with dry chemicals and include AAA, AA, C, D, N, 9-volt, and button-cell types. The chemistry of these batteries is divided into the categories below, which should be indicated on the battery. Recycling requirements vary; follow the directions posted by each recycling outlet.

- **ALKALINE (LR) & ZINC-CARBON (ZNC) BATTERIES** Zinc-carbon batteries are labeled as general purpose or heavy duty; they are dry cell and non-toxic but can leak with age (info on cleaning leaked batteries below). While this type may be disposed of with your trash, we encourage you to seek out recycling outlets where they exist.
- **LITHIUM (PRIMARY, CR)** batteries are dry cell and non-toxic, but handle with care as they can overheat and explode if short circuited. Remove lithium batteries from any device in which they’re used before disposing or recycling the device and/or the batteries; cover or tape the battery terminals marked + and - before recycling to prevent fire risk.
- **MERCURY** batteries are dry cell but should be kept safe from high heat or flames to avoid the release of toxic vapors.
- **SILVER OXIDE (SR)** batteries are dry cell and non-toxic.
- **ZINC-AIR** batteries are dry cell and non-toxic.
- **NOTE:** Button-cell battery chemistry varies, indicated by the markings CR, SR, LR, often included in the part number.

## Rechargeable Batteries

Rechargeables come in varying sizes, shapes, and voltages; they are recharged with a charging adaptor that is plugged into an electrical outlet. Rechargeables can be recharged multiple times/cycles before needing to be replaced and recycled. The chemistry of these batteries includes

- **SMALL SEALED LEAD-ACID (SSLA/PB) GEL BATTERIES** These come in rectangular, custom sizes, housed in a hard-plastic case. Examples of their use are motorized emergency equipment, wheelchairs, ride-on toys, boats, RVs, portable tools, etc. They do contain lead, a toxic heavy metal and if short-circuited, they can cause fire.

- **LITHIUM-ION (LI-ION) BATTERIES** These come in custom sizes in hard-plastic cases, small cylinders, or button-cells. Examples of their uses are phones, laptop computers, power tools, hybrid vehicles, and handheld electronics. Handle with care as they can overheat and explode if short circuited. Remove from any device before disposing or recycling, being sure to cover/tape terminals (see instructions below) before recycling to eliminate fire risk.
- **NICKEL-CADMIUM (NICAD) BATTERIES** These can be recharged up to 1,000 times. They come as AAA, AA, C, D, small cylinders, poly-wrapped cell packs, and custom sizes in hard-plastic cases. They are commonly used for cell phones, laptop computers, power tools, handheld electronics, toys, remote control (R/C) hobby vehicles, and medical equipment. They do contain cadmium, a toxic heavy metal, and should be kept safe from high-heat or flames to avoid the release of toxic vapors.
- **NICKEL METAL HYDRIDE (NIMH) BATTERIES** These can be recharged up to 1,000 times. They come as AAA, AA, C, D, small cylinders, poly-wrapped cell packs, and custom sizes in hard-plastic cases. They are commonly used for cell phones, laptop computers, digital devices, power tools, hybrid automobiles, handheld electronics, and remote-control hobby vehicles. They are dry cell and non-toxic.

**Preparing Batteries for Recycling:** Prepare batteries for recycling safely. Separately by chemistry and either individually bag each type or pack and seal in original containers; to prevent sparking or fires, some recycling outlets require battery terminals (marked + or -) to be covered with tape (masking tape preferred). Place multiple button-cell batteries on a strip of tape with the positive (+) terminal on the tape; secure by placing another tape strip over the negative (-) terminal(s). More details at <https://www.rawmaterials.com/page/education/prepare-batteries/>.

## Cleaning Up after a Leaked Battery

- Remove failed battery from device and package for disposal in sealed bag to recycle or dispose (*only* alkaline and zinc-carbon may be put in the trash; others must be recycled),
- work in a well-ventilated area,
- wear household gloves and glasses,
- use a toothbrush or cotton swab to remove battery leakage from device's electrical contacts,
- clean Alkaline, NiCAD, and NiMH batteries using equal amounts (50/50 ratio) diluted vinegar or lemon juice with water,
- completely dry the cleaned electronic device before installing a new battery.

**Automotive Batteries:** There are three types of automotive batteries lead-acid batteries, valve-regulated lead-acid (VRLA) batteries, and hybrid vehicle batteries, which are all rechargeable. Lead-acid are wet-cell and contain liquids that are corrosive and should be handled with care. Place them in a proper container when transporting for recycling. VRLA batteries are dry cell but do contain lead and acid so they should be handled with care. Hybrid vehicle batteries are dry cell and generally contain lithium ion Li-ion or nickel metal hydride (NiMH). Hybrid batteries are recycled by the service provider or automotive company replacing the batteries or repairing or junking the vehicle and are not accepted by automotive battery recyclers listed below.

## Recycling Outlets and Batteries Accepted

Battery Recycling Outlets	Rechargeable	Alkaline, Zn-C	Button-cell	Automotive (excludes hybrid)
<b>Anacortes</b>				
Ace Hardware	x	x	x	
City of Anacortes	x		x	
Les Schwab Tires				x
O'Reilly Auto Parts				x
Piston Service				x
<b>Burlington</b>				
AutoZone				x
Best Buy	x		x	
Home Depot	x		x	
Les Schwab				x
Skagit River Steel & Recycling				x
<b>Mt Vernon</b>				
AutoZone				x
Clear Lake Recycling & Compactor Site	x		x	
Les Schwab				x
Lowe's	x			
O'Reilly Auto Parts				x
Pacific Power Batteries	x	x	x	x
Skagit County Household Hazardous Waste Facility	x		x	x
Walmart (kiosk at entry or automotive department)	x (kiosk)		x (kiosk)	x
<b>Sedro-Woolley</b>				
Car Quest				x
Les Schwab				x
O'Reilly Auto Parts				x
Sedro-Woolley City Recycling Ctr	x	x	x	x

## Online Resources

Battery Solutions (types of batteries & recycling) <https://www.batterysolutions.com>

Battery University (learn about batteries) <https://batteryuniversity.com/learn/>

Call2Recycle (find battery recycling locations) <https://www.call2recycle.org/>, downloadable battery guide <https://www.call2recycle.org/download/19168>

Earth 911 (find recycling locations and mail-in recycling options) <https://earth911.com/>

Washington E Cycle (find recycling locations) <https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Electronics>

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