

Frequently Asked Questions

Non-Rechargeable Batteries

Click on question or scroll through document for answers.

1. [Is it a good idea to store batteries in a refrigerator or freezer?](#)
2. [Why is mixing batteries of different chemistries, brands or age a potential problem?](#)
3. [What type of batteries can be recharged?](#)
4. [How long can I store batteries?](#)
5. [How can I test batteries to see if they're still good?](#)
6. [What is the difference between carbon zinc and alkaline batteries?](#)
7. [Why doesn't my flashlight work well in cold weather?](#)
8. [Are there potential dangers or safety issues carrying loose batteries in a purse or pocket?](#)
9. [How long will my batteries last in a device?](#)
10. [How is the rated capacity of a battery determined?](#)
11. [Does the capacity of a battery change with the drain rate?](#)
12. [Is there a guarantee on *Energizer®* batteries?](#)
13. [What increases the possibility for alkaline battery leakage?](#)
14. [Are cylindrical alkaline batteries considered hazardous waste?](#)
15. [Where can I obtain information on the effects of swallowing a battery?](#)
16. [Are *Energizer®* batteries RoHS and WEEE compliant?](#)
17. [Are *Energizer®* batteries compliant to the EU Battery Directive \(226/66/EC\)?](#)
18. [Can I fly commercially with non-rechargeable *Energizer®* primary lithium batteries?](#)
19. [Do *Energizer®* batteries require an MSDS?](#)

Frequently Asked Questions

Non-Rechargeable Batteries

1. Is it a good idea to store batteries in a refrigerator or freezer? ↑

No, storage in a refrigerator or freezer is not required or recommended for batteries produced today. Cold temperature storage can in fact harm batteries if condensation results in corroded contacts or label or seal damage due to extreme temperature storage. To maximize performance and shelf life, store batteries at normal room temperatures (68°F to 78°F or 20°C to 25°C) with moderated humidity levels (35 to 65% RH).

2. Why is mixing batteries of different chemistries, brands or age a potential problem? ↑

Mixing of battery types (different chemistries, brands and/or fresh vs. used) in a device is not recommended and can significantly increase the potential for leakage and reduced device run time. The primary concern is an imbalance in capacities or available energy between the installed batteries. As the weakest battery becomes exhausted, it will be forced discharged by the stronger batteries to very low or negative voltage levels which drastically increases the potential for leakage.

3. What type of batteries can be recharged? ↑

Only batteries that are labeled as **rechargeable** are capable of being safely recharged. Attempting to recharge non-rechargeable batteries greatly increases the potential for leakage and rupture. Charging must be conducted in chargers specifically approved for each product type which may vary depending on brand and model of both battery and charger.

4. How long can I store batteries? ↑

When stored at room temperature (i.e. 70°F/ 21°C), cylindrical alkaline batteries have a shelf life of 5 to 7 years and cylindrical carbon zinc 3 to 5 years. Lithium Cylindrical types can be stored from 10 to 15 years. Prolonged storage at elevated temperatures will shorten storage life.

5. How can I test batteries to see if they're still good? ↑

A battery tester (loaded voltmeter) is a simple and effective way to determine if a battery is "good" or "bad". Most testers place an appropriate load on the batteries and then read the voltage. A voltmeter without a load can give very misleading information and is not recommended for this purpose. Note that testers are typically not capable of providing reliable run time estimates.

6. What is the difference between carbon zinc and alkaline batteries? ↑

The term Super Heavy Duty (SHD) refers to the zinc chloride carbon zinc (CZn) chemical system which has largely replaced the LeClanché CZn "General Purpose" chemical system. Alkaline batteries are a premium product associated with global brand names such as *Energizer®*. Carbon zinc batteries are best suited for low drain applications such as clocks and simple smoke alarms or short intermittency devices such as remote controls.

Frequently Asked Questions

Non-Rechargeable Batteries

7. Why doesn't my flashlight work well in cold weather? ↑

Alkaline and carbon zinc batteries contain a water based electrolyte. As the battery temperature approaches the freezing point of water (32°F or 0°C) chemical reactions within the battery slow down due to reduced ion mobility. Ion mobility defines the ability of electrons to freely move, critical to the generation of electricity through a chemical reaction. The net result is a reduction in overall performance or run time which can be recovered as temperatures approach typical room conditions (68°F to 78°F or 20°C to 25°C).

8. Are there potential dangers or safety issues carrying loose batteries in a purse or pocket? ↑

Yes, batteries can be short-circuited by metal items such as coins, keys, paperclips etc. A battery that is subjected to a short circuit can become very hot and increase the potential for leakage and personal injury.

9. How long will my batteries last in a device? ↑

There are several factors that impact length of service or run time. The most important aspect is the rate at which the device consumes power. A high drain device such as a digital camera will deplete a battery faster than a low drain device like a clock. Other factors affecting overall battery performance are environmental conditions, device usage patterns (continuous or intermittent) and battery size/chemistry.

10. How is the rated capacity of a battery determined? ↑

The capacity of a battery is typically expressed in milliamp-hours (mAh). For primary batteries, samples are discharged at a specific current drain (i.e. 25mA) and time recorded to a cutoff voltage (i.e. 0.8 volts). The time (hours) it takes the battery to reach the cutoff voltage is then multiplied by the current drain to establish the mAh capacity of the battery. Rechargeable batteries (NiMH) are rated based on a C/10 charge followed by a C/5 discharge.

11. Does the capacity of a battery change with the drain rate? ↑

A battery is typically much more fuel efficient at lower current drains. Therefore, available capacity will drop significantly as drain rates and/or the voltage functional endpoint increases.

12. Is there a guarantee on *Energizer®* batteries? ↑

Yes, the *Energizer®/Eveready®* guarantee typically states: "We will repair or replace, at our option, any device damaged by this battery if it is sent with batteries to *Energizer®*. Guarantee void if user or device recharges battery." Guarantee may vary globally so check with the local *Energizer®* office for details.

Frequently Asked Questions

Non-Rechargeable Batteries

13. What increases the possibility for alkaline battery leakage? ↑

Typically alkaline batteries will not leak under normal storage and/or usage conditions. The potential for leakage is significantly increased however if the batteries are subjected to charging, mixing of battery chemistries, mixing of fresh and used batteries, physical damage, extended exposure to high temperature or deep discharged. Alkaline battery leakage is extremely caustic and contact with bare skin should be avoided. In the event that battery leakage comes in contact with your skin, flush the area for 15 minutes with copious amounts of water and seek medical attention.

14. Are cylindrical alkaline batteries considered hazardous waste? ↑

In the United States and many other countries cylindrical alkaline batteries are classified as common household waste. Great strides have been made in making alkaline batteries more environmentally friendly which have been manufactured free of added mercury since the mid 1990's. Classification details may vary however and should be confirmed in each specific geographical location.

15. Where can I obtain information on the effects of swallowing a battery? ↑

The United States national poison control number is 800-222-1222 or 202-625-3333 (collect). This is a 24-hour service that is partially funded by the battery industry.

16. Are *Energizer®* batteries RoHS and WEEE compliant? ↑

Batteries are not subject to the RoHS and WEEE directives.

17. Are *Energizer®* batteries compliant to the EU Battery Directive (226/66/EC)? ↑

Energizer® batteries that are designated for sale in this region will be EU compliant. However, not all batteries sold worldwide will have the necessary markings required by the EU battery directive. All *Energizer®* batteries sold worldwide would be EU compliant except for the required markings.

18. Can I fly commercially with non-rechargeable *Energizer®* primary lithium batteries? ↑

Yes, but all primary lithium batteries must be in carry-on luggage. Effective January 1, 2008, you may not pack spare lithium batteries in your checked baggage. For additional information regarding travelling with lithium batteries, please visit the [US DOT Safe Travel Web Site](#).

19. Do *Energizer®* batteries require an MSDS ? ↑

As defined in OSHA Hazard Communication Standard, Section 1910.1200(c), *Energizer®* batteries are manufactured "articles", which do not result in exposure to a hazardous chemical under normal conditions of use. For this reason, Material Safety Datasheets are not required. As a courtesy to our customers, *Energizer®* has prepared copyrighted [Product Safety Datasheets](#) to provide information on the different Eveready/ *Energizer®* battery systems.