

Frequently Asked Questions

Alkaline Batteries

1. What is the difference between Super Heavy-Duty and Alkaline batteries?

The term Super Heavy Duty (SHD) refers to the zinc chloride carbon zinc (CZn) chemical system which has largely replaced the LeClanche CZn "General Purpose" chemical system. Alkaline batteries are a premium product associated with global brand names such as Energizer and Duracell. SHD batteries are generally less expensive to purchase compared to alkaline batteries, and typically have inferior performance across all drain rates or applications. SHD batteries are best suited for low drain applications such as clocks and simple smoke alarms or short intermittency devices such as remote controls.

2. 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).

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

No, storage in refrigerators or freezers 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).

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

Mixing of battery types as noted above (different chemistries, brands and/or age – 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.

5. Are there potential dangers or safety issues carrying loose batteries in a purse or pockets?

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.

6. 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.

7. 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 very high draining device like a digital camera will deplete a battery much quicker 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.

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8. What is the difference between Energizer e2 Titanium and the Energizer Max alkaline batteries?

Both brands are standard alkaline based chemical systems, however Energizer e2 Titanium is a premium product specifically designed for "high tech" applications. Energizer e2 Titanium alkaline typically delivers superior performance in high drain devices.

9. How is the rated capacity of a battery determined?

The capacity of a battery is typically expressed in milli -Amp 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/5 discharge following a C/10 charge.

10. Does the mAh 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.

11. 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 Super Heavy-Duty (carbon zinc) 3 to 5 years. Storing the batteries at higher temperatures, shortens the shelf life.

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12. 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.

13. 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 Eveready. Guarantee void if user or device recharges battery." Guarantee may vary globally so check with the local Energizer office for details.

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

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

15. Are alkaline batteries considered hazardous waste?

In the United States and many other countries 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.

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16. 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.

17. Can Alkaline batteries be charged in an Energizer NiMH or NiCd battery charger?

No! Standard alkaline batteries are not designed to be recharged and should never be placed in any battery charger. Attempting to charge alkaline batteries will significantly increase the likelihood for leakage to occur. Rechargeable alkaline batteries (made by other manufacturers) may also leak if placed in a NiMH or NiCd charger and should only be recharged in a charger designed for this system.