



Battery quality can have a dramatic impact on camera performance. Understanding battery technology will be beneficial when using scouting cameras.

How long should my batteries last?

It is impossible to predict exactly how long batteries will last in a camera. Battery life is dependent upon many things, including:

- 1) Quality, brand, and age of batteries. More expensive batteries last longer, especially in cold weather.
- 2) Battery life is significantly less in cold temperatures.
- 3) The more images taken the fewer days the batteries will last.
- 4) The more days the camera operates the fewer images can be taken on a set of batteries.

As a result, you may get less than 2 weeks on a set of batteries in cold temperatures when used on a feeder with the camera taking 250 images a day. Or, you may get 5 months of battery life in warm temperatures on a deer trail with the camera only taking 25 images a week. And you can expect just about anything in between.

One way to think of battery life is like this how long does your car run on a tank of gas? If your car is only used to go back and forth to work you may go a week or more on a tank of gas. But if you are on a long journey you will only get hours on a tank of gas. So, just because the batteries lasted 5 months in one situation, does not mean the batteries will last 5 months when setup differently or used at different times of the year.

Batteries we recommend

- D cell: Rayovac, Duracell, or Energizer alkaline batteries.
- AA cell: Rayovac, Duracell, or Energizer alkaline batteries.
- AA cells for maximum performance: Energizer Lithium batteries.
- Not all batteries are the same, so you may get different battery life from different brand batteries and even within the same brand of battery.
- If your camera appears to be not working correctly the first thing you should do is change batteries.

When to change batteries

Weak batteries can cause the camera to perform poorly. Follow these guidelines to determine when to change batteries:

- When the battery level indicator is 10% or lower (in temperatures below freezing you may want to change batteries when level indicator is at 25%)
- When night images begin having reduced illumination (image may be dark or poor quality)
- When the camera takes excessive blank images or triggers on the delay setting
- If the camera fails to operate or power on

Cold temperature use

If you use your camera in cold conditions (daily temperatures consistently below 32 F / 0 C) we recommend:

- Expect about ½ the battery life you would get in warm temperatures.
- It is a good idea to change batteries at the beginning of the cold season, say November 1st, to assure your camera is properly powered during the upcoming cold conditions.
- Using a longer camera delay, say 1 minute or more, will give the batteries a recovery period and will greatly extend battery life and improve camera performance.

Technical information about alkaline batteries

Current Output: Batteries are a scouting camera's engine, and to help understand battery technology, we will compare them to a car engine. Consider a V8 automotive engine with 400 HP. The engine will produce 400 HP regardless if the tank of gas is full, half full, or nearly empty. Furthermore, the engine will continue to run until the gas tank is depleted. You may think batteries would perform similar to engines, but alkaline batteries do not. Alkaline batteries would be like a car engine that loses horsepower as the gas tank empties. A full gas tank would produce 400 HP, while a gas tank half empty would only produce 200 HP. Alkaline batteries are like this, as their power is depleted they lose the ability to produce maximum power.

Temperature Affects: Alkaline batteries are also greatly affected by temperature. Let's go back to our V8 engine. Imagine that the engine produces 400 HP at 70 degrees. But, when the temperature drops to 20 degrees the engine only produces 200 HP. Of course engine output does not degrade (for the most part) in cold temperature, but alkaline batteries do deliver less power in cold temperatures.

Brand Differences: To complicate this even more, not all alkaline brands of batteries are the same. Battery brand X may perform completely different than battery brand Y. Let's compare this to compound bows. One 60 pound draw compound bow may shoot the arrow at 300 fps, while a different 60 pound draw bow may only shoot the same arrow at 225 fps. When purchasing batteries you need to consider that not all batteries are the same.

Battery Aging: An additional problem is that alkaline batteries lose their power overtime, even when not operating a device. Batteries manufactured 12 months ago may not have as much power as those manufactured recently.

The limitations of alkaline batteries may affect camera performance in these ways:

- 1) Camera will experience shorter battery life in cold temperatures
- 2) Camera's may experience reduced IR image quality as batteries age
- 3) Camera's may experience reduced IR image quality in cold temperatures
- 4) The camera may experience intermittent performance when batteries are weak
- 5) Old batteries may not operate the camera correctly

For the above reasons, we only recommend you use high quality name brand batteries in our cameras. We recommend Rayovac, Duracell, and Energizer brand batteries only. We also recommend that if your camera is having problems with your camera the first thing to do is replace the batteries with brand new batteries.

Technical information about lithium AA batteries

Lithium batteries have numerous advantages over alkaline batteries. First, their output is consistent as the batteries age, just like the V8 engine that produces 400 HP regardless how much gas is in the tank, lithium batteries will generally produce full output over their lifespan. Furthermore, lithium batteries do not degrade in cold temperatures. Finally, lithium batteries can deliver more current. High current is beneficial for IR cameras that require high current for maximum illumination. The downside is that lithium AA batteries are expensive, typically about \$2 each. However, lithium batteries will provide the best performance in cold temperatures, give exceptional night IR performance, and will generally last longer. Lithium AA batteries will give you the best performance from your AA powered camera. In fact, do to their longer life span they may be overall less expensive to use than alkaline AA cells.

Rechargeable Batteries

There are numerous types of rechargeable batteries. The most popular rechargeable batteries are NiCd (nickel cadmium), NiMH (nickel metal) and lithium ion (Li-ion). We do not recommend NiCd and NiMH batteries. They deliver lower voltage and have less capacity than alkaline batteries. Rechargeable Li-ion batteries are a good option, but they are not readily available.

Some users have tried to operate cameras from lead acid batteries. These batteries do not directly plug into any Cuddeback camera and require camera modification by the user.

Furthermore, applying voltage greater than 7 volts to the camera will damage the camera. For these reasons, we do not recommend using lead acid batteries with Cuddeback cameras.

Battery Leakage

Batteries use chemicals to create voltage, and these chemicals are corrosive. When not used properly batteries can leak corrosive chemicals that can ruin products. I am sure you've seen flashlights that were ruined because of battery leakage. Don't let leakage ruin your camera. Please follow these guidelines.

- 1) ***Always verify that the batteries are installed correctly.*** Installing batteries in the wrong positive-negative orientation may cause batteries to explode and damage your camera.
- 2) ***The most common cause of leaking batteries is leaving a camera in the field with dead batteries.***
- 3) Throughout the season remove depleted batteries promptly, especially during cold weather. Never leave depleted batteries in the camera.
- 4) Never leave batteries installed in your camera while the camera is not being used. Always remove batteries at the end of each season.
- 5) And once more, use Rayovac, Duracell, & Energizer batteries. We believe these brands are less likely to leak.

It is your responsibility to use batteries correctly. Cuddeback's warranty does not cover damage caused by battery leakage. To help you prevent battery leakage, follow these guidelines that we have gathered from various battery manufacturers' web sites.

- **Do not mix battery types.** For example, do not use alkaline batteries with non-alkaline or rechargeable batteries. The different discharge rates will eventually lead to a condition where one battery has less voltage than another. This condition may allow the stronger battery to charge the weaker battery, which may cause the weaker battery to overheat and leak.

- **Replace all batteries at the same time.** Do not mix fresh and used batteries. With mixed batteries, the more powerful batteries may charge the weaker batteries, which may cause the weaker batteries to overheat and leak.
- **Insert batteries into your camera properly,** with the (+) and (-) terminals aligned correctly. An incorrect orientation of one battery will create very high current flow which may cause a battery to explode. CAUTION: A product may appear to work properly even if one battery is inserted incorrectly.
- **Remove batteries for storage.** Batteries should be removed from any device that will be stored for long periods of time. Unattended devices are likely to deplete the batteries and depleted batteries are more likely to leak.
- **Remove depleted batteries** promptly. Depleted batteries are more likely to leak.
- **Do not charge alkaline or other non-rechargeable batteries.**
- **Do not use damaged batteries.** If a battery has been physically damaged or dented, do not use it.
- **Batteries cannot deliver as full power when they are cold,** resulting in reduced battery life in cold conditions.