

Ever Ready Batteries are designed and manufactured, so far as is reasonably practicable, so as to be safe and without risk to health when properly used.

Supplied as sealed units they represent no chemical hazard in the sense of the Control of Substances Hazardous to Health (COSHH) Regulations.

Chemical hazard can however arise if batteries are misused or abused when leakage or, in extreme cases, fire or explosion may occur.

In order to avoid potential problems the Battery Safety Guidelines (copy attached) should be observed on storage, use and disposal.

Detailed Chemical Hazard information for each battery type is attached (Tables 1-7). The following is a summary of the more likely hazards in practice.

1. ZINC CARBON BATTERIES (Ever Ready Blue Range)

The main chemical hazard arises if the battery leaks or vents. The electrolyte is a concentrated solution of zinc chloride and ammonium chloride in water. The material is acidic, corrosive and will cause burns to skin. The electrolyte is also harmful if it enters the eyes. If the user comes into contact with the electrolyte then the part affected should be washed immediately with water. If the material enters the eye medical attention should be sought without delay.

The Cathode mix is corrosive and contains manganese dioxide which is toxic if ingested. Medical attention should be sought if ingestion is thought to have arisen.

2. ZINC CHLORIDE BATTERIES (Ever Ready Silver Seal Range)

The main chemical hazard arises if the battery leaks or vents. The electrolyte is a concentrated solution of zinc chloride in water. This material is acidic, corrosive and will cause burns to skin. The electrolyte is also harmful if it enters the eyes. If the user comes into contact with zinc chloride then the part affected should be washed immediately with water. If the material enters the eye medical attention should be sought without delay.

The cathode mix is corrosive and contains manganese dioxide which is toxic if ingested. Medical attention should be sought if ingestion is thought to have arisen.

3. ALKALINE MANGANESE BATTERIES (Ever Ready Energizer Range)

The main hazard arises if the battery leaks or vents. The electrolyte is strongly alkaline 34-38% w/w potassium hydroxide which is highly corrosive. It will cause burns to skin externally (or internally). Potassium hydroxide is exceedingly harmful if allowed to enter the eyes. Anyone coming into contact with potassium hydroxide should wash with copious amounts of water. Tissue damage is not usually apparent until several hours after exposure. If the material enters the eyes emergency hospital treatment should be sought without delay.

Alkaline manganese cells contain amalgamated zinc powder (1.5%Hg) and manganese dioxide. Both these substances are toxic by ingestion.

4. BUTTON CELLS

Any type of button cell is hazardous if swallowed. If this arises immediate medical attention should be sought. Surgical removal of the battery may be necessary.

The chemical hazard depends on the system type. If button cells are ingested even the nickel plated case material will dissolve in the stomach acid giving rise to toxic nickel salts. Most button cells contain 34-40% potassium hydroxide solution which is highly corrosive but present in small volume.

Mercuric oxide-zinc button cells are the most hazardous if ingested because they contain approximately 30% by cell weight of highly toxic mercuric oxide powder in the cathode. Other button cells also contain amalgamated zinc powder which may be harmful if ingested.

5. NICKEL-CADMIUM BATTERIES

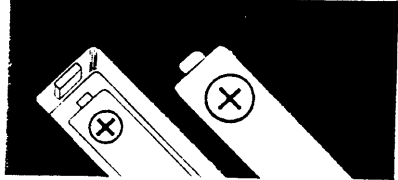
These batteries contain 30% potassium hydroxide solution which is highly corrosive. Normally this material would only be expelled under overcharge conditions. These batteries also contain cadmium, cadmium hydroxide and nickel hydroxide all of which are toxic. If the user comes into contact with potassium hydroxide then the affected area should be washed with a copious supply of water. Potassium hydroxide is harmful if it enters the eyes.

# BATTERY SAFETY CODE

Used correctly, domestic batteries are a safe and dependable source of portable power. Problems can occur if they are misused or abused—resulting in leakage or, in extreme cases, fire or explosion.

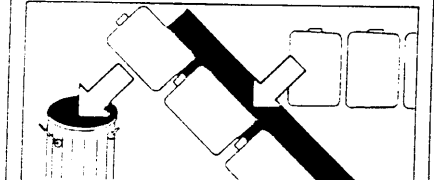
Here are some simple guidelines to safe battery use designed to eliminate any such problems.

**ALWAYS**



Take care to fit your batteries correctly, observing the *plus* and *minus* marks on the battery and appliance. Incorrect fitting can cause leakage or, in extreme cases, fire or even an explosion.

**ALWAYS**



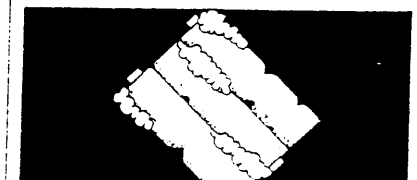
Replace the whole set of batteries at one time, taking care not to mix old and new batteries or batteries of different types, since this can result in leakage or, in extreme cases, fire or even an explosion.

**ALWAYS**



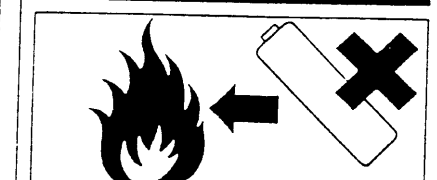
Store unused batteries in their packaging and away from metal objects which may cause a short-circuit resulting in leakage or, in extreme cases, fire or even an explosion.

**ALWAYS**



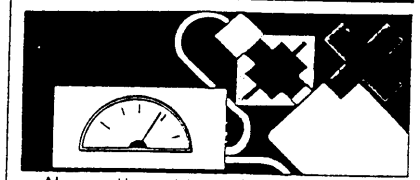
Remove dead batteries from equipment and all batteries from equipment you know you are not going to use for a long time. Otherwise the batteries may leak and cause damage.

**NEVER**



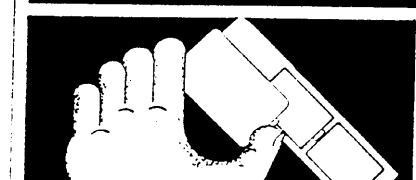
Never dispose of batteries in fire as this can cause them to explode. Please put dead batteries in with the normal household waste.

**NEVER**




Never attempt to recharge ordinary batteries, either in a charger or by applying heat to them. They may leak, cause fire or even explode. There are special rechargeable batteries which are clearly marked as such.

**ALWAYS**




Supervise children if they are replacing batteries themselves in order to ensure these guidelines are followed.

**ALWAYS**



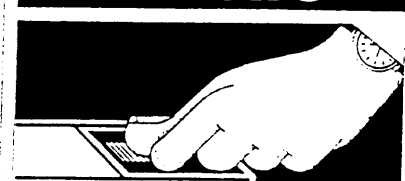
Remember that small button cell batteries such as used in some hearing aids, toys, games and other appliances, are easily swallowed by young children and this can be dangerous.

**ALWAYS**




Keep loose button cells away from young children.

**ALWAYS**



Make sure battery compartments are secure.

**ALWAYS**



Seek medical advice if you believe a cell has been swallowed.

Table 1. Components of Blue Range Leclanche Batteries (round and layer cell)  
which could be exposed if cells leaked or disrupted on abuse.

SUBSTANCE	HAZARD LEVEL	TYPE OF HAZARD
Zinc Can (Anode)	Low	Low Health risk; could be reactive fire hazard
Mercury (in Can)	Low	High toxicity but present at trace level
Cadmium (in Can)	Low	High toxicity but present at trace level
Lead	Low	High toxicity present at low concentration
Manganese dioxide	High	Toxic material present in large quantity. Irritant oxidising agent (assists fire). Avoid ingestion.
Ammonium chloride (electrolyte)	High	Corrosive, harmful if ingested. Avoid eye/skin contact.
Zinc chloride (electrolyte)	High	Corrosive, harmful if ingested. Avoid eye/skin contact.
Methyl cellulose coated paper separator	Low	Low hazard, but would contain corrosive electrolyte components, traces of mercury and manganese dioxide.
Carbon rods (RC) Carbon coat on zinc (LC)	Low	Low hazard, but would be wet with corrosive electrolyte and is in contact with manganese dioxide.
Carbon Black (also Graphite in layer cells)	Low	Low oral toxicity, but is mixed with harmful manganese dioxide and corrosive electrolyte components
Bitumen Sealant (RC) or Wax (LC)	Low	Low hazard, but material is in contact with other hazardous materials
Shrink sleeve (LC)	Low	May contain cadmium oxide low ingestion hazard (danger on incineration)
Outer Labels/ Metal Jackets	Low	Inks may be harmful if ingested in some cases
Plated metal components	Low	Nickel or copper surfaces when corroded lead to the formation of toxic metal salts. Avoid ingestion
Chlorine (not a primary constituent)	Low	Toxic gas, but only formed if batteries charged or reverse positioned
Nitrogen trichloride (not a primary constituent)	Low	Explosive compound which can be formed in rare instances during battery reversal or charging

NOTE RC = Round Cell (R20, R14, R6, etc)  
 LC = Layer Cells (PP3, PP7, PP9, etc)