
# SAFETY DATA SHEET

Product Name: Alkaline Battery (LR6)

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## 1. Identification of the substance/preparation and of the company / undertaking

Product name: Alkaline zinc-manganese dioxide batteries
Product Designation: LR6
Nominal Voltage: 1.5V
Chemical system: Zinc/ Manganese Dioxide
Designed for recharge: Yes_No√
Company name: Tenergy Corporation
436 Kato Terrace, Fremont, CA 94539
United States
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## 2. Hazards identifications

General advice: The common known rules for handling of chemicals should be obeyed. These chemicals are contained in a sealed steel can. For consumer use, adequate hazard warnings are printed on both the package and the battery. Potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically or electrically abused. Concentrated potassium hydroxide contained is caustic. Anticipated potential leakage of potassium hydroxide is 2-20 ml, depending on battery size. Do not eat and drink batteries. Keep batteries away from small children.

Physical-Chemical Hazards: This preparation is not classified as dangerous according to the criteria of directive 99/45/EEC.

Hazards to man: If battery leaking, exposure to caustic ingredients may occur. Therefore, may cause sensitization by skin contract.

Hazards to environment: N.A..

## 3. Compositions /Information on Ingredients

Chemical Nature: Alkaline zinc-manganese dioxide batteries

| MATERIALS | CAS# | APPROXIMATE PERCENT OF TOTAL WEIGHT (~%) |
|---|---|---|
| Manganese Dioxide ($MnO_2$) | 1313-13-9 | 42.6 |
| Zinc (Zn) | 7440-66-6 | 16.1 |
| Water ($H_2O$) | 7732-18-5 | 12.2 |
| Potassium Hydroxide (KOH) | 1310-58-3 | 5.2 |
| Graphite | 7782-42-5 | 3.0 |
| Brass | 12597-71-6 | 2.4 |
| Steel | 7439-89-6 | 15.7 |
| Ni-plating | 7440-02-0 | 0.3 |
| Nylon-66 | None | 1.6 |
| Fiber | None | 0.9 |

| IMPURITY | CAS# | APPROXIMATE PERCENT OF TOTAL WEIGHT (~%) |
|---|---|---|
| Mercury (Hg) | 7439-97-6 | <0.0001 |
| Lead (Pb) | 7439-92-1 | <0.0030 |
| Cadmium (Cd) | 7440-43-9 | <0.0003 |
| Arsenic (As) | 7440-38-2 | <0.0001 |

**4. First–aid measures**

Inhalation: In case of excessive inhalation due to leaking batteries remove to fresh air. Obtain medical advice.
Skin Contact: If exposed to a leaking battery, remove contaminated clothing. Wash exposed areas with plenty of water and soap. If irritation occurs, consult a physician.
Eye contact: If a battery is leaking and materials contact eyes, flush immediately with running water for at least 15 minutes. Consult an ophthalmologist at once.
Ingestion: Not anticipated due to size of batteries. Choking may occur with the smaller size batteries. If exposed to a leaking battery, rinse mouth and surrounding areas with running water for at least 15 minutes. Give plenty of water to drink. Do not induce vomiting. Obtain medical advice.

**5. Fire-fighting measures**

Suitable extinguishing media: Carbon dioxide ($CO_2$), foam, dry chemical powder.
Extinguishing media not to be used: Never use a direct water jet.
Exposure hazards from combustion products: In case of fire, carbon dioxide, carbon monoxide and other toxic organic substances will be generated. Do not inhale fumes and smoke.
Personal protective equipments: Wear full protective clothing. Use self-contained breathing apparatus.

**6. Accidental release measures**

Personal precautions: Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured batteries. Avoid eye or skin contact and inhalation of vapours. Increase the ventilation. Wear protective clothing. Keep unprotected persons away.
Environmental precautions: Avoid discharge and penetration into sewerage systems, waterways, pits, and cellars.
Methods for cleaning up: Collect spilled material with an insert standard absorbent like sand or silica. Care for well-ventilated conditions. Recycle or dispose of the materials in an appropriate way.

**7. Handling and storage**

General handling: Obey the common known rules and precautions for handling with chemicals. Avoid mechanical and electrical abuse. Do not short battery or install incorrectly. Batteries may explode, pyrolize or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries according to equipment instructions. Do not mix battery systems, such as alkaline and zinc- carbon. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag. Do not remove battery labels.
Storage: Store product in well-filled, appropriate coated and tightly closed containers avoiding influence of oxygen/air, light and humidity. Storage at room temperature.

**8. Exposure controls and personal protection**

Exposition/Technical measures: Atmospheric vapour concentrations must be minimized by adequate ventilation.
Protection of hands, eyes and skin: None required under normal use conditions. When handling leaking batteries, use neoprene, rubber or nitrile gloves and wear safety glasses to protect hands, eyes and skin.
General safety and hygiene measures: Use only as directed.

**9. Physical and chemical properties**

Physical state: Stainless steel top battery Colour: Contents dark and gray in colour
Odour: N.A.
Melting point: N.A.
Boiling point: N.A.
Flash point: N.A.
Explosion limit: Not available
Ignition temperature: Not available
Vapour pressure: Not available
Specific gravity: N.A.

Solubility in water: N.A.
Solubility in other solvents: N.A.
PH value: Not available
Partition coefficient: Not available
Viscosity: Not available

**10. Stability and Reactivity**
Thermal decomposition: Batteries may burst and release hazardous decomposition products when exposed to fire.
Substances to avoid: Strong oxidation agents.
Hazardous reactions: Contents incompatible with strong oxidizing agents.
Hazardous decomposition products: Thermal degradation may produce hazardous fumes of zinc and manganese; hydrogen gas; caustic vapors of potassium hydroxide and other toxic by-products.

**11. Toxicological information**
Toxicity information is available on the battery ingredients noted in Section 2, but in general, N.A. to intact batteries.
Chronic health effects: N.A.

**12. Ecological information**
Not available

**13. Disposable considerations**
Product: Dispose in accordance with appropriate regulations. If in doubt, contact your local government office concerned for information. Do not incinerate, since batteries may explode at excessive temperatures.

**14. Transport Information**
Road (ADR/RID): Not regulated

Air (ICAO/IATA):
IATA DGR(56$^{th}$): Special Provision A123: “Examples of such batteries are: alkali-manganese, zinc-carbon,, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery ... having the potential of a dangerous evolution of heat must be prepared for transport as to prevent (a) a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals...) is forbidden from transport; and (b) accidental activation. The words “Not Restricted” and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.”

Sea (IMDG):
IMDG CODE: Special Provision 304 which says: “Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkaline-manganese, zinc-carbon, nickel metal hydride and nickel-cadmium batteries”

These batteries are not regulated by international agencies as hazardous materials or dangerous goods when shipped. A shipping name of “Alkaline Batteries – Non-hazardous” may be used on all domestic and international bills of lading.
In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for Tenergy alkaline batteries has been designed to be compliant with these regulatory concerns.

**15. Regulatory Information**

Symbol: N/A
EC labeling: None
Risk phrases: None
Safety phrases: None
Labeling is not required because alkaline batteries are classified as “articles” under the Dangerous Preparations Directive and as such are exempt from the requirements of the Directive.

**16. Other information**

The information on this Material Safety Date Sheet (MSDS) was obtained form current and reputable sources. However, the data is provided without any warranty; expressed or implied, regarding its correctness or accuracy. It is the user’s responsibility to assume liability on loss, injury, damage, or expense resulting from improper use of this product. Any previous MSDS of this product mentioned above are hereby replaced with this new document. We urge you to make this information available as appropriate in your organization and to any others with whom you arrange to handle this product.