



PRODUCT SAFETY DATA SHEET

1. Product and Company identification

Product Category : Alkaline Manganese Battery
Type : LR6 / LR03
Nominal Voltage : 1.5 V

Supplier's Name : FDK CORPORATION
Supplier's Address : 5-36-11 Shimbashi, Minato-Ku, Tokyo, 105-8677, Japan
Telephone +81-3-3434-1279

Manufacturer's Name : FDK ENERGY CO., LTD.
Manufacturer's Address: 614 Washizu, Kosai-Shi, Shizuoka, 431-0431, Japan
Telephone +81-53-576-2111

2. Composition and Ingredients information (Metal casing prevent leaking out of internal ingredients from battery)

Material	CAS No.	PRTR	Contents
Manganese dioxide [MnO ₂]	1313-13-9	I - 311	35 ~ 38 wt%
Graphite [C]	7782-42-5	-	2 ~ 3 wt%
Zinc [Zn]	7440-66-6	-	15 ~ 18 wt%
Potassium Hydroxide [KOH]	1310-58-3	-	5 ~ 8 wt%

3. Summary of hazard

Fatal hazard :	No information available
Health hazard :	Chemical contents are contained in sealed cathode can. Potential risk of exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically, physically or electrically abused. For consumer use, adequate hazard warnings are included on package or on the battery. Most likely risk is acute exposure when a cell vents KOH it releases caustic alkali and attacks the skin and eye. Anticipated potential leakage of KOH is 2 to 20 ml, depending on battery size.
Impact on environment :	No information available KOH and MnO ₂ may be hazardous to the environment; Special attention should be given to water organisms.

4. First aid

Inhalation :	Contents of an opened battery cathode can cause respiratory irritation. Provide fresh air. Refer for medical attention.
Skin contact :	Contents of an opened battery cathode can cause skin irritation and/or chemical burns. Remove contaminated clothes and rinse skin with plenty of water. If chemical burn occurs or if irritation persists, get medical assistance.

Eye contact :	Contents of an opened battery can cause severe irritation and chemical burns. Immediately rinse with plenty of water for several minutes (remove contact lenses if possible), get medical assistance.
Ingestion :	Contents of an opened battery can cause chemical burns of mouth, esophagus, and gastrointestinal tract. Rinse mouth. Do not induce vomiting. Refer for medical assistance.
Swallowing :	In case of swallowing a battery, get immediate medical assistance.

5. Fire fighting

In case of fire, use any type of water based fire extinguisher, CO₂ or so. In the initial state of fire, if possible remove batteries near the fire source to a safety location. Cool exterior of batteries to prevent rupture. Put on protective glasses, mask, gloves, etc.

6. Spillage disposal

Chemical contents are contained in sealed cathode can, if battery is mechanically or electrically abused, mishandled, the contents may leak. In that case, wipe with a cloth absorbed with boric acid solution or water and wash away remainder with plenty of water. (Put on protective glasses, mask, gloves.)

7. Precautions for handling and storing

Handling :	<p>If battery is misused or abused, leaks, heats in extreme case, rupture may result. Therefore pay attention to next few points.</p> <ol style="list-style-type: none"> (1) This battery is not designed for rechargeable. Do not charge. (2) Do not short. (3) Be sure batteries are installed in right direction. (4) Do not mix different type batteries nor mix new and old together. (5) Do not directly heat, solder nor throw into fire. (6) Do not disassemble, deform nor modify batteries. (7) Do not allow children to replace batteries without adult supervision.
Storage :	<p>Batteries shall be stored in well-ventilated, dry and cool conditions. For normal storage, the temperature recommended between 10°C and 25°C(50°F and 77°F) and never to exceed +30°C(86°F). Extreme humidity (over 95% RH and below 40% RH) for sustained periods should be avoided. Do not expose batteries to direct sunlight for a long period or rain water. Exposure to a high temperature will increase deterioration of performance and facilitates electrolyte leakage. When batteries get wet, their insulation resistance decreases, self-discharge may occur and they may start to rust.</p>

8. Prevention from exposure

Respiratory protection : Not necessary under normal use.
 Eye protection : Not necessary under normal use.
 Skin protection : Not necessary under normal use.
 Other protective tools : Not necessary under normal use.

9. Physical and chemical characteristics

Shape :	Cylindrical
pH :	NA
Boiling point :	NA
Melting point :	NA
Decomposition temperature :	NA
Flash point :	NA
Vapor pressure :	NA
Specific gravity :	NA
Solubility :	NA

10. Stability and reactivity

Batteries are very stable as long as used normally.

Avoid the following conditions as rupture of battery or leakage of contents may occur.

Do not: Charge, short, heat, throw fire, and disassemble batteries.

11. Toxicity information

No toxicity, chemical contents are safely contained in sealed cathode can.

12. Ecological information

When batteries are disposed of in ground leakage may occur by corrosion as times go by. However, improper handling may affect the environment in the long run.

Our batteries do not involve any hazardous materials restricted in EU Battery Directive (2006/66/EC), followings show measurement limit of the result of analysis of battery, not showing of actual contents of hazardous materials.

Mercury below 0.5 ppm

Cadmium below 4 ppm

Lead below 40 ppm

13. Disposal precautions

Dispose in accordance with applicable federal, state and local regulations.

14. Transportation precautions

For handling

Avoid rough handling of battery cartons. Batteries shall be kept in dry and cool conditions. Do not place batteries in a place exposed to direct sunshine for a long time or splashed by rain water. Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other.

Special Provision for transportation

Alkaline Manganese Batteries are considered to be "dry cell" batteries and are unregulated for purposes

of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and the International Maritime Organization (IMO). The only requirement for shipping these batteries by DOT is Special Provision 130 which states: "Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals). The only requirements for shipping these batteries by ICAO and IATA is Special Provision A123 which states: "A battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation. In addition, in the case of air transportation of batteries which is conformed to this requirement, the information "Not restricted, as per Special Provision A123" shall be noted in certain column of "Substances" of air waybill." The international Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under Special Provision 304 which says: "Batteries, dry, containing corrosive electrolyte which will not flow out of 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."

15. Applicable regulations

No special regulations are applied to Alkaline Manganese Batteries except below Special Provisions.
Special Provision 130 of DOT
Special Provision A123 of ICAO and IATA

16. Other information

Reference ; IEC 60086-1(2006), 60086-2 (2006), 60086-5 (2005).
JIS C 8500(2006), JIS C 8515(2008), JIS C 8514(2007).
Database on TSCA Inventory(EPA) , Ministry of the Environment Japan.
