

PRODUCT SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

The battery products referenced in this PSDS/MSDS document are consumer products. Under OSHA regulations, batteries are considered “articles” and are not subject to the OSHA Hazard Communication Standard PSDS/SDS requirements which apply for “hazardous chemicals in the workplace.” Additionally, batteries are considered “articles” under the Global Harmonized System and are exempted from the GHS labeling and SDS classification criteria. This PSDS document is provided as service in response to requests for information on battery use, safety and regulatory compliance.

Product Name: ALKALINE BATTERIES

Product Identification: Alkaline Zn-MnO₂ Battery

Designations: LR03 (AAA) ; LR6 (AA) ; LR14 (C) ; LR20 (D) ; LR8D425 (AAAA) ; 6LR61 (9V)

Nominal Voltage: 1.5 V/ (6LR61:9.0V)

Product Use: Energy Source

Effective Date: 2025-01-01

Company Identification

Producer Name: Fujian Nanping Nanfu Battery Co., Ltd.

Address: 109 Industry Road, Nanping, Fujian, P.R.C., 365000

Fax: +86 599 400 8873599

Tel: +86 599 8731146

Email: Service@nanfu.com

Emergency Phone Number: INFOTRAC 24-Hour Emergency Response Hotline: 400-8873599 (P.R.C.)

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION: May explode or leak, and cause burn injury, if recharged, disposed of in fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label.

Potential Health Effects:

The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Damaged battery will release concentrated potassium hydroxide, which is caustic. Anticipated potential leakage of potassium hydroxide is 2 to 20 mL, depending on battery size.

Eye Contact: Contact with battery contents may cause severe irritation and burns. Eye damage is possible.

Skin Contact: Contact with battery contents may cause severe irritation and burns.

Inhalation: Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.

Ingestion: Swallowing is not anticipated due to battery size. Choking may occur if smaller AAA /AAAA batteries are swallowed. Ingestion of battery contents (from a leaking battery) may cause mouth, throat and intestinal burns and damage.

PRODUCT SAFETY DATA SHEET

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS No. | Amount (%) | Classification |
|--------------------------------|------------|------------|----------------|
| Manganese Dioxide | 1313-13-9 | 36-44 | Xn, R20/22 |
| Zinc | 7440-66-6 | 13-18 | N, R50/53 |
| Potassium Hydroxide (40%) | 1310-58-3 | 4-9 | |
| Graphite, natural or synthetic | 7782-42-5 | 1-4 | Xn, R22, R35 |
| Steel | 7439-89-6 | 10-18 | |
| Brass | 12597-71-6 | 2-4 | |
| Zinc Oxide | 1314-13-2 | < 1 | |
| Ni-plating | 7440-02-0 | < 0.5 | |
| Water, paper, plastic, other | -- | Balance | |

| Impurity | CAS No. | Content |
|--------------|-----------|----------|
| Mercury (Hg) | 7439-97-6 | < 1 ppm |
| Cadmium (Cd) | 7440-43-9 | < 2 ppm |
| Lead (Pb) | 7439-92-1 | < 15 ppm |

Note : The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Hazardous Ingredients as defined by OSHA, 29 CFR 1910.1200. and/or WHMIS under the HPA.

SECTION 4: FIRST AID MEASURES

General Advice: The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Damaged battery will release concentrated potassium hydroxide, which is caustic. Anticipated potential leakage of potassium hydroxide is 2 to 20 ml, depending on battery size.

Eye Contact: If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 30 minutes. Seek immediate medical advice.

Skin Contact: If battery is leaking and material contacts the skin, remove any contaminated clothing and flush exposed skin with copious amounts of running water for at least 15 minutes. If irritation, injury or pain persists, seek medical advice.

Inhaled: If battery is leaking, contents may be irritating to respiratory passages. Move to fresh air. If irritation persists, seek medical advice.

Swallowed: If battery contents are swallowed, do not induce vomiting. If the victim is alert, have them rinse their mouth and the surrounding skin with water for at least 15 minutes. Seek immediate medical attention.

Note: This SDS does not include or address the small button batteries which can be ingested.

PRODUCT SAFETY DATA SHEET

SECTION 5: FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Batteries may burst and release hazardous decomposition products when exposed to a fire situation.

Extinguishing Media: Use any extinguishing media that is appropriate for the surrounding fire.

Special Fire Fighting Procedures: Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing. Fight fire from a distance or protected area. Cool fire exposed batteries to prevent rupture. Use caution when handling fire-exposed containers (containers may rocket or explode in heat of fire).

Hazardous Combustion Products: Thermal degradation may produce hazardous fumes of zinc and manganese; hydrogen gas, caustic vapors of potassium hydroxide and other toxic by-products.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured batteries. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in an appropriate container for disposal.

SECTION 7: HANDLING AND STORAGE

Avoid mechanical or electrical abuse. **DO NOT** short circuit or install incorrectly. Batteries may explode pyrolyze or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Do not mix battery systems, such as alkaline and zinc carbon, in the same equipment. Replace all batteries in equipment at the same time. Do not carry batteries loose in a pocket or bag. Do not remove battery tester or battery label.

Storage: Store batteries in a dry place at normal room temperature. Do not refrigerate – this will not make them last longer.

SECTION 8: EXPOSURE CONTROLS/PRESONAL PROTECTION

The following occupational exposure limits are provided for informational purposes. No exposure to the battery components should occur during normal consumer use.

Refer to specific country regulations for additional exposure limit information.

| Chemical Name | Exposure Limits |
|---------------|---------------------------------|
| Zinc | None established for zinc metal |

PRODUCT SAFETY DATA SHEET

| | |
|---------------------|---|
| Manganese Dioxide | 5 mg/m ³ Ceiling OSHA PEL 0.2 mg/m ³ TWA ACGIH TLV 0.5 mg/m ³ TWA UK WEL 0.5 mg/m ³ TWA (inhalable) DFG MAK 0.2 mg/m ³ VL Belgium 0.2 mg/m ³ TWA Denmark LV |
| Potassium Hydroxide | 2 mg/m ³ Ceiling ACGIH TLV 2 mg/m ³ STEL UK WEL 2 mg/m ³ VCD Belgium 2 mg/m ³ Ceiling Denmark LV |
| Graphite | 15 mppcf TWA OSHA PEL (natural-non-fibrous) 2 mg/m ³ TWA (respirable dust) ACGIH TLV (natural-non-fibrous) 5 mg/m ³ TWA (respirable dust), 15 mg/m ³ TWA (total dust) OSHA PEL 2 mg/m ³ TWA (respirable dust) ACGIH TLV (synthetic non-fibrous) 4 mg/m ³ TWA UK WEL (respirable dust) 10 mg/m ³ TWA UK WEL (inhalable dust) 1.5 mg/m ³ TWA DFG MAK (respirable dust) 4 mg/m ³ TWA DFG MAK (inhalable dust) 2 mg/m ³ VL Belgium (respirable dust) |

Ventilation: No special ventilation is needed for normal use.

Respiratory Protection: None required for normal use.

Skin Protection: None required for normal use. Use neoprene, rubber or latex gloves when handling leaking batteries.

Eye Protection: None required for normal use. Wear safety goggles when handling leaking batteries.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--------------------------------------|-------------------------------|
| Appearance and Odor | Solid object / no odor |
| Boiling Point @ 760 mm Hg (°C) | Not applicable for an Article |
| Water Solubility | Insoluble |
| Vapor Pressure (mm Hg @ 25°C) | Not applicable for an Article |
| Vapor Density (Air = 1) | Not applicable for an Article |
| Density (g/cm ³) | 3.0 – 4.2 |
| Percent Volatile by Volume (%) | Not applicable for an Article |
| Evaporation Rate (Butyl Acetate = 1) | Not applicable for an Article |
| Physical State | Solid |
| Solubility in Water (% by weight) | Not applicable for an Article |
| pH | Not applicable for an Article |

PRODUCT SAFETY DATA SHEET

SECTION 10: STABILITY AND REACTIVITY

Stability: This product is stable.

Incompatibility/Conditions to Avoid: Contents are incompatible with strong oxidizing agents. Do not heat, crush, disassemble, short circuit or recharge.

Hazardous Decomposition Products: Thermal decomposition may produce hazardous fumes of zinc and manganese; caustic vapors of potassium hydroxide and other toxic by-products.

Hazardous Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Potential Health Effects:

The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Damaged battery will release concentrated potassium hydroxide, which is caustic. Anticipated potential leakage of potassium hydroxide is 2 to 20 ml, depending on battery size.

Eye Contact: Contact with battery contents may cause severe irritation and burns. Eye damage is possible.

Skin Contact: Contact with battery contents may cause severe irritation and burns.

Inhalation: Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.

Ingestion: Swallowing is not anticipated due to battery size. Choking may occur if smaller AAA /AAAA batteries are swallowed. Ingestion of battery contents (from a leaking battery) may cause mouth, throat and intestinal burns and damage.

Acute Toxicity Data:

Manganese Dioxide: LD50 oral rat >3478 mg/kg

Potassium Hydroxide: LD50 oral rat 273 mg/kg

Chronic Effects: The chemicals in this product are contained in a sealed can and exposure does not occur during normal handling and use. No chronic effects would be expected from handling a leaking battery.

Target Organs: Skin, eyes and respiratory system.

Carcinogenicity: None of the components of this product are listed as carcinogens by ACGIH, IARC, NTP or OSHA.

SECTION 12: ECOLOGICAL INFORMATION

No ecotoxicity data is available. This product is not expected to present an environmental hazard.

SECTION 13: DISPOSAL INFORMATION

Disposal should be in accordance with Federal, state/provincial and local regulations. Products covered by this SDS, in their original form, when disposed as waste, are considered non hazardous waste according to Federal RCRA regulations (40 CFR 261). Some communities offer recycling or collection of alkaline batteries – contact your local government for disposal practices in your area.

PRODUCT SAFETY DATA SHEET

Alkaline batteries can be safely disposed of with normal household waste. Due to concerns about mercury in the municipal solid waste stream, Nanfu has voluntarily eliminated all of the added mercury from its alkaline batteries since 2000. Individual consumers may dispose of spent (used) batteries with household trash. Nanfu does not recommend that spent batteries be accumulated and disposed of in large quantities. Do not incinerate except for disposal in a controlled incinerator.

Nanfu (or Excell) alkaline Zn-MnO₂ batteries are labeled with “special collection” symbol (as shown) in accordance with Annex I of Regulation (EU)2023/1542-Heavy Metals Content in batteries and waste batteries.



SECTION 14: TRANSPORT INFORMATION

Alkaline batteries (sometimes referred to as “Dry Cell” or “Household” batteries) are not listed or regulated as dangerous goods under the IATA Dangerous Goods Regulations, ICAO Technical Instructions, IMDG Code, UN Model Regulations or U.S. hazardous regulations (49CFR).

However, special regulatory provisions apply that require batteries to be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits. Product shipped in its original unopened Nanfu (or Excell) packaging is compliant with the following packaging special provisions.

Ground Transport (ADR/RID/US DOT): 49 CFR172.102 Special Provision 130.

Air Transport (IATA): Special Provision A123 (IATA DGR Edition 2025 –66 th Edition).

The words ‘**NOT RESTRICTED**’ and the ‘**Special Provision A123**’ must be included on the description of the substance on the Air Waybill, when air waybill is issued.

Marine/Water Transport (IMDG/ICAO): NONE

* Special provisions apply and shippers should consult the most current versions of the transportation regulations.

SECTION 15: REGULATORY INFORMATION

EU Classification of Preparation: Not classified as a dangerous preparation.

EU RoHS Directive: Batteries are not subject regulation.

EU Battery Regulation: alkaline batteries comply with Annex I of Regulation (EU)2023/1542-Heavy Metals Content in batteries and waste batteries and as a result contain <0.0005% (5 ppm) mercury, <0.002% (20 ppm) cadmium and <0.004% (40 ppm) lead. The chemical symbols Hg, Cd and Pb are therefore **not** required below the separate collection symbol.

REACH: Subject battery products are “**articles**” under REACH and not subject to REACH registration or e-SDS requirements. To the best of our knowledge, Nanfu alkaline batteries do not contain any of the 242 SVHCs per the ECHA updated Candidate List of Nov. 07, 2024.

EU Labeling: None Required. Labeling is not required because batteries are classified as articles under both REACH and the Dangerous Preparations Directive and are exempt from the labeling requirements.

PRODUCT SAFETY DATA SHEET

United States

EPA TSCA Status: All intentionally-added components of this product are listed on the US TSCA Inventory.

OSHA Status: While the finished product(s) is considered an article and not covered by the OSHA Hazard Communication Standard, 29 CFR 1910.1200, this MSDS/PSDS contains valuable information critical to the safe handling and proper use of the product.

CPSIA 2008: Alkaline batteries are exempt.

EPA Mercury Containing and Rechargeable Battery Management Act of 1996: Compliant.

EPA TSCA: All intentionally-added components of this product are listed on the US TSCA Inventory.

EPA SARA 313/302/304/311/312 chemicals: Manganese compounds 36-44%; Zinc 13-18%.

California: This product has been evaluated and does not require warning labeling under California Proposition 65.

State Right-to-Know and CERCLA:

The following ingredients present in the finished product are listed on state right-to-know lists or state worker exposure lists

| Ingredient | CAS # | Level % | CERCLA RQ | State | | | | |
|---------------------|------------------------|---------|-----------|-------|----|----|----|----|
| | | | | IL | MA | NJ | PA | RI |
| Manganese Dioxide | 1313-13-9 | 36-44 | None | Y | Y | N | Y | Y |
| Zinc | 7440-66-6 | 13-18 | 1000 lb | Y | Y | Y | Y | N |
| Potassium Hydroxide | 1310-58-3 | 4-9 | 1000 lb | Y | Y | Y | Y | Y |
| Graphite | 7782-42-5 7440-44-0 | 1-4 | None | Y | Y | N | Y | Y |

Canada

All intentionally-added components of this product are listed on the Canadian DSL. This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and this MSDS contains all information required by the Controlled Products Regulations.

P.R.C.

Mercury Free Battery (GB 24427-2021) as a result contain <0.0001% (1 ppm) mercury .

SECTION 16: OTHER INFORMATION

Hazard Rating: Health: 0 Fire: 0 Reactivity: 0

(4=EXTREME / 3=HIGH / 2=MODERATE / 1=SLIGHT / 0=NOT SIGNIFICANT)

* Hazard Ratings are Risk Phrases for Reference.

EU Classes and Risk Phrases for Reference (See Sections 2 and 3)

C - Corrosive

N - Dangerous for the Environment

Xn - Harmful

R20/22 - Harmful by inhalation and if swallowed.

R22 - Harmful if swallowed.

R35 - Causes severe burns

R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Data supplied is for use only in connection with occupational safety and health.

PRODUCT SAFETY DATA SHEET

Reference:

- 2025 IATA DGR 66th Edition

DISCLAIMER: This MSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by NANFU to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. NANFU assumed no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

