

Safety Data Sheet (SDS)

The content and format of this SDS is accordant with 29 CFR 1910.1200 (OSHA standard)

1. Identification

Product identifier:

Product name: Alkaline zinc – manganese dioxide batteries

Other means of identification:

Product code: LR03

Recommended use of the chemical and restrictions on use: Power supply. Restrictions on use: Do NOT use it in an application which may contaminate food or do harm to human health.

Manufacturer/Supplier: Ningbo GP & Sonluk Battery Co., Ltd.

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2. Hazards identification

GHS classification (*for contact with leakage from rupture*):

Physical hazards: Not classified

Health hazards: Skin corrosion/irritation - Category 1B

Serious eye damage/eye irritation - Category 1

Sensitisation, skin - Category 1

Carcinogenicity - Category 2

Environmental hazards: Hazardous to the aquatic environment, acute hazard - Category 2

Hazardous to the aquatic environment, long-term hazard - Category 2

Note: *This product is generally not hazardous under normal conditions. But like any sealed container, battery may rupture when exposed to excessive heat and this could result in the release of hazardous materials. The information below is given to minimize any possible hazard during handling, storage and disposal.*

Signal Word: Danger

Pictograms:



Hazard Statements (*for contact with leakage from rupture*):

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H351: Suspected of causing cancer.

H401: Toxic to aquatic life.

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements *(for contact with leakage from rupture):*

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/ vapours/spray.

P264: Wash hands thoroughly after handling.

P272: Contaminated work clothing should not be allowed out of the workplace.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response Precautionary Statements *(for contact with leakage from rupture):*

P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P363: Wash contaminated clothing before reuse.

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P310: Immediately call a POISON CENTER/doctor.

P321: Specific treatment (Please see the specific measures for accident that included in the label, or go to hospital for treatment).

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P302 + P352: IF ON SKIN: Wash with plenty water.

P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P391: Collect spillage.

Storage precautionary statements *(for contact with leakage from rupture):*

P405: Store locked up.

Disposal precautionary statements *(for contact with leakage from rupture):*

P501: Dispose of contents/container according to relevant local and national regulations (It is recommended to recycle and reuse it).

Other hazards: Not found.

3. Composition/information on ingredients

Product description: substance (); mixture (✓).

Ingredient (s)	CAS No.	EC No.	% by weight
Manganese dioxide	1313-13-9	215-202-6	42.0
Iron	7439-89-6	231-096-4	21.2
Zinc	7440-66-6	231-175-3	16.9
Water	7732-18-5	231-791-2	7.2
Potassium hydroxide	1310-58-3	215-181-3	4.8

Brass	12597-71-6	603-111-8	3.5
Graphite	7782-42-5	231-955-3	2.5
Nylon-66	32131-17-2	608-706-6	0.9
Cellulose	9004-34-6	232-674-9	0.7
Nickel	7440-02-0	231-111-4	0.3

4. First aid measures

Persons using this product should consult a physician or other medical professional if an accident involving this product results in injury. Specific first-aid measures are as follows (for contact with leakage from rupture):

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER/doctor.

Skin Contact: Take off immediately all contaminated clothing. Rinse skin with water [or shower]. Immediately call a POISON CENTER/doctor. Wash contaminated clothing before reuse.

Eyes Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.

Ingestion: Rinse mouth. Do not induce vomiting without doctor's instruction. Immediately call a POISON CENTER/doctor.

Acute effect and delayed effect:

Acute effect: Causes severe skin burns and eye damage. May cause an allergic skin reaction.

Delayed effect: Suspected of causing cancer.

Personal protective equipment: Wear protective gloves/protective clothing/eye protection/face protection when necessary.

Indication of immediate medical attention and treatment needed, if necessary: Treat according to symptoms and exposure dose.

5. Fire-fighting measures

Extinguishing Media: Use water spray, foam, dry chemical or dry sand to extinguish.

Unsuitable Extinguishing Media: Reinforced liquid (straight stream).

Special hazards arising from the chemical: Cell may vent when subjected to excessive heat-exposing battery contents.

Fire Fighting Method:

For initial fire, use dry powder, carbon dioxide, etc.

For large fire, it is effective to use fire foam, etc. to shut off air supply.

Deny unnecessary entry to the place around the fire.

Remove containers from fire area if it can be done without risk.

Cool surrounding facilities, etc. with water spray.

Extinguish fire from upwind, and the fire extinguishing method should be appropriate to the situation in the surroundings.

Special Fire Fighting Procedures: Structural firefighters must wear self-contained breathing apparatus and full protective equipment.

6. Accidental release measures

Personal precautions, protective equipment, and emergency procedures:

Personal precautions: Use proper personal protective equipment as indicated in Section 8.

Emergency procedures: Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Stop leak if you can do it without risk.

Environmental precautions: Keep cleaning run-offs out of municipal sewers and open bodies of water. Comply with local and national laws and regulations.

Methods and material for containment and cleaning up:

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

7. Handling and storage

Precautions for safe handling:

Do not breathe vapors or fumes that may be evolved during processing.

Do not disassemble or burn batteries.

Do not squeeze or pierce batteries.

Do not put batteries into water.

Workers must wear proper protective equipment and must operate strictly according to relative rules.

Conditions for safe storage, including any incompatibilities:

NOTE: STAY AWAY FROM SOURCES OF HEAT

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

Incompatible substances or mixtures: No information available.

Packing material: No information available.

8. Exposure controls/personal protection

Occupational Exposure Limits:

Ingredients	OSHA PEL-TWA	ACGIH TLV-TWA
Manganese dioxide (CAS: 1313-13-9)	5 mg/m ³	0.1 mg/m ³
Potassium hydroxide (CAS: 1310-58-3)	--	2 mg/m ³
Graphite (CAS: 7782-42-5)	15 mppcf	2 mg/m ³
Cellulose (CAS: 9004-34-6)	Total dust: 15 mg/m ³ Respirable fraction: 5 mg/m ³	10 mg/m ³
Nickel (CAS: 7440-02-0)	1 mg/m ³	1.5 mg/m ³

Engineering Controls:

Use this product only in closed systems fully or with local exhaust ventilation.

Install washer eyes and safety showers near to the handling and storage area.

Shows the location of these facilities, with a clear and prominent warning board.

Personal Protective Equipment (For workers):

Protection of Hands:

Not necessary under conditions of normal use.

Recommend wearing protective gloves for industrial hygienic purpose (*for contact with leakage from rupture*).



Protection of Eyes:

Not necessary under conditions of normal use.

Wear safety glasses when working in a dusty environment or liquid may splash (*for contact with leakage from rupture*).



Respiratory Protection:

Not necessary under conditions of normal use.

Wear appropriate respirators when vapour or fume is generated from processing (*for contact with leakage from rupture*).



Protection of Body:

Recommend wearing general working clothing.



General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Wash hands before breaks and at the end of work.

9. Physical and chemical properties

Physical state	Solid
Color	No data available
Odor	No data available
Odor threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Initial boiling point and boiling range	No data available

Flash point	No data available
Flammability (solid, gas, etc.)	No data available
Upper/lower flammability or explosive limits	No data available
Vapor pressure	No data available
Relative vapor density	No data available
Density	No data available
Relative density	No data available
Solubility (ies)	No data available
Partition coefficient: n-octanol/Water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Kinematic viscosity	No data available
Particle characteristics	No data available
Other information	Nominal Voltage: 1.5 V

10. Stability and reactivity

Reactivity: Not reactive under normal handling and storage.

Chemical stability: Stable under normal temperatures and pressures.

Possibility of hazardous reactions: If leaked, the electrolyte may react violently with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

Conditions to Avoid: Heating, mechanical abuse and electrical abuse.

Incompatible materials: If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

Hazardous decomposition products: It may release hazardous fume (e.g. Carbon monoxide, carbon dioxide) from thermal decomposition.

11. Toxicological information

Product Toxicity Data:

Ingredient (s)	CAS No.	LD ₅₀ /LC ₅₀ (Median lethal dose)
Manganese dioxide	1313-13-9	Acute toxicity (Oral) LD ₅₀ > 3,480 mg/kg (rat) Data source: ECHA
Iron	7439-89-6	Acute toxicity (Oral) LD ₅₀ : 98,600 mg/kg (rat) Data source: ECHA
Zinc	7440-66-6	Acute toxicity (Oral) LD ₅₀ > 2,000 mg/kg (rat) Data source: ECHA
Water	7732-18-5	No data available
Potassium hydroxide	1310-58-3	Acute toxicity (Oral) LD ₅₀ : 333 mg/kg (rat) Data source: ECHA
Brass	12597-71-6	No data available
Graphite	7782-42-5	Acute toxicity (Oral) LD ₅₀ > 2,000 mg/kg (rat)

		Data source: ECHA
Nylon-66	32131-17-2	No data available
Cellulose	9004-34-6	Acute toxicity (Oral) LD ₅₀ > 5,000 mg/kg (rat) Data source: KOSHA Acute toxicity (Dermal) LD ₅₀ > 2,000 mg/kg (rabbit) Data source: KOSHA
Nickel	7440-02-0	Acute toxicity (Oral) LD ₅₀ > 9,000 mg/kg (rat) Data source: NITE-CHRIP
The whole product		Acute toxicity (Oral) LD ₅₀ > 2,000 mg/kg (Calculated value) Acute toxicity (Dermal) LD ₅₀ > 2,000 mg/kg (Calculated value)
Classification of the whole product:		Not classified

Skin corrosion/irritation (*for contact with leakage from rupture*):

Potassium hydroxide (CAS: 1310-58-3): Category 1A (Data source: EU CLP Specific Concentration limits:
Eye Irrit. 2; H319: 0,5 % ≤ C < 2 %
Skin Corr. 1A; H314: C ≥ 5 %
Skin Corr. 1B; H314: 2 % ≤ C < 5 %
Skin Irrit. 2; H315: 0,5 % ≤ C < 2 %)
Classification of the whole product: Category 1B

Serious eye damage/eye irritation (*for contact with leakage from rupture*):

Potassium hydroxide (CAS: 1310-58-3): Category 1 (Data source: EU CLP Specific Concentration limits:
Eye Irrit. 2; H319: 0,5 % ≤ C < 2 %
Skin Corr. 1A; H314: C ≥ 5 %
Skin Corr. 1B; H314: 2 % ≤ C < 5 %
Skin Irrit. 2; H315: 0,5 % ≤ C < 2 %)
Classification of the whole product: Category 1

Sensitisation, respiratory (*for contact with leakage from rupture*):

No classification for this product.

Sensitisation, skin (*for contact with leakage from rupture*):

Nickel (CAS: 7440-02-0): Category 1 (Data source: EUCLP)
Classification of the whole product: Category 1

Germ cell mutagenicity (*for contact with leakage from rupture*):

No classification for this product.

Carcinogenicity (*for contact with leakage from rupture*):

Nickel (CAS: 7440-02-0): Category 2 (Data source: EUCLP)
Classification of the whole product: Category 2

Reproductive Toxicity (*for contact with leakage from rupture*):

No classification for this product.

Specific target organ toxicity, single exposure (*for contact with leakage from rupture*):

No classification for this product.

Specific target organ toxicity, repeated exposure (*for contact with leakage from rupture*):

Nickel (CAS: 7440-02-0): Category 1 (lungs) (Data source: EUCLP)
Classification of the whole product: Not classified

Aspiration hazard (*for contact with leakage from rupture*):

No classification for this product.

12. Ecological information

Ecotoxicity:

Manganese dioxide (CAS: 1313-13-9):

96h-LC₅₀ > 100 mg/L, fish (*Oncorhynchus mykiss*) (ECHA)

Iron (CAS: 7439-89-6):

96h-LC₀ > 50,000 mg/L, fish (*Danio rerio*) (ECHA)

Zinc (CAS: 7440-66-6):

96h-LC₅₀: 0.315 mg/L, fish (*Thymallus arcticus*) (ECHA)

25d-NOEC: 0.036 mg/L, fish (*Oncorhynchus mykiss*) (ECHA)

Hazardous to the aquatic environment, acute hazard - Category 1 (EU CLP)

Hazardous to the aquatic environment, long-term hazard - Category 1 (EU CLP)

Graphite (CAS: 7782-42-5):

96h-LC₅₀ > 100 mg/L, fish (*Danio rerio*) (ECHA)

Classification of the whole product:

Hazardous to the aquatic environment, acute hazard - Category 2

Hazardous to the aquatic environment, long-term hazard - Category 2

Persistence and degradability: No data available.

Bioaccumulative potential: No data available.

Mobility in Soil: No data available

Other adverse effects: No relevant information.

13. Disposal considerations

Waste treatment methods:

It is recommended to recycle and reuse it.

Any disposal practice must be in compliance with country, local, state, and federal laws and regulations.

After contents are completely removed, dispose of its container at hazardous or special waste collection point.

Paste a label on the container indicating the possible hazards of the waste.

14. Transport Information

DOT/Air-Transportation- IATA/ICAO/Sea-Transportation-IMO/IMDG:

NOTE: STAY AWAY FROM SOURCES OF HEAT

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Packing Group Symbol: Not applicable

Marine Pollutant (Yes/No): No

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not applicable

EMS NO.: Not applicable

Special precautions:

Check whether the package is completed or sealed before transporting; make sure no damage of packages and prevent goods from falling down during transporting; the transport vehicle should be equipped with facilities for fire-fighting and accidental release handling; do NOT transport this product together with incompatible substances; stay away from fire and areas of high temperature during stopovers.

15. Regulatory information

United States:

Emergency Planning and Community Right-to-Know Act (EPCRA) section 313 chemicals:

Chemical Name	CAS No.	Weight-%	SARA 313 – Threshold Values %
Zinc	7440-66-6	16.9	1
Nickel	7440-02-0	0.3	0.1

40 CFR part 355 (Extremely Hazardous Substances): Not listed.

California Proposition 65 (Chemicals Known to the State to Cause Cancer or Reproductive Toxicity):

Chemical Name	CAS No.	Type of Toxicity
Nickel	7440-02-0	Cancer

Clean Water Act:

Ingredient (s)	CWA - Reportable Quantities	CWA - Hazardous Substances	CWA - Priority Pollutants	CWA - Toxic Pollutants
Zinc (CAS: 7440-66-6)	454 kg	Listed	Listed	Listed
Potassium hydroxide (CAS: 1310-58-3)	454 kg	Listed	Not listed	Not listed
Nickel (CAS: 7440-02-0)	45.4 kg	Listed	Listed	Listed

Toxic Substances Control Act (TSCA):

Chemical Name	CAS No.	TSCA Inventory
Manganese dioxide	1313-13-9	Listed
Iron	7439-89-6	Listed
Zinc	7440-66-6	Listed
Water	7732-18-5	Listed
Potassium hydroxide	1310-58-3	Listed
Brass	12597-71-6	Not listed
Graphite	7782-42-5	Listed
Nylon-66	32131-17-2	Listed
Cellulose	9004-34-6	Listed
Nickel	7440-02-0	Listed

Carcinogenicity categories: Nickel (CAS: 7440-02-0): IARC-2B.

Other relevant laws and regulations:

Candidate List of Substances of very high concern (SVHC) according to ECHA: Not listed.

REACH Regulation Annex XVII Regulation List: Nickel (CAS: 7440-02-0).

REACH Regulation Annex XIV Authorization List: Not listed.

(EC) 1272/2008 Annex VI Table 3.1:

Ingredient(s)	EC No. 1272/2008 Classification	
	CLASS. CODE	HAZARD CODE
Manganese dioxide (CAS: 1313-13-9)	Acute Tox. 4 *	H332
	Acute Tox. 4 *	H302
Zinc (CAS: 7440-66-6)	Pyr. Sol. 1	H250
	Water-react. 1	H260
	Aquatic Acute 1	H400
	Aquatic Chronic 1	H410
Potassium hydroxide (CAS: 1310-58-3)	Acute Tox. 4 *	H302
	Skin Corr. 1A	H314
Nickel (CAS: 7440-02-0)	Carc. 2	H351
	STOT RE 1	H372 **
	Skin Sens. 1	H317

Germany – WGK: WGK-3.

16. Other information

DISCLAIMER:

All the information of this SDS is true and effective, and only for reference. Our company will not control the way how people use it, neither will we be responsible for any consequence. The users shall decide how to properly use the product or adopt certain production way for some special purpose. The above-mentioned precautionary measures are helpful to avoid damage to the property or life safety during the operation or use of this product.

References:

Globally Harmonized System of Classification and Labelling of Chemicals (GHS Rev.7, 2017)

Globally Harmonized System of Classification and Labelling of Chemicals (GHS Rev.8, 2019)

ANSI Z400.1/Z129.1-2010

OSHA Hazard Communication Standard (HCS) 2024

Full description of some acronyms:

CAS-Chemical Abstracts Service

EINECS-European Inventory of Existing Commercial Chemical Substances

IMO-International Maritime Organization

IMDG-International Maritime Dangerous Goods

IATA-International Air Transport Association

ICAO-International Civil Aviation Organization

TSCA-Toxic Substances Control Act

OSHA-Occupational Safety and Health Administration

ACGIH- American Conference of Governmental Industrial Hygienists

ECHA- European Chemicals Agency

NITE-CHRIP- Japan National Institute of Technology and Evaluation-Chemical Risk Information Platform

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*****The End*****