

SAFETY DATA SHEET

HCS-2012 APPENDIX D TO §1910.1200

Version 1
Product Name ALKALINE Zn-Mn DRY BATTERY

Issue Date 03-Nov-2017
Revision date 03-Nov-2017

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name ALKALINE Zn - Mn DRY BATTERY LR03
Product Code LR03AAA, LR6AA, LR14C, LR20D, 6LR619V, LR61AAAA

Other means of identification

Synonyms No information available.

Recommended use of the chemical and restrictions on use

Recommended Use Used as power supply.
Uses advised against No information available.

Details of the supplier of the safety data sheet

Supplier Yongneng (Hong Kong) Holdings Ltd.
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2. HAZARDS IDENTIFICATION

GHS Classification

Not classified

Label elements

Symbols/Pictograms None
Signal word None
Hazard Statements Not classified
Precautionary Statements Not classified

Hazards not otherwise classified (HNOC)

Batteries contain manganese dioxide which may boost combustion of other substances that may vent, ignite and produce sparks when subjected to high temperature, when damaged or abused (e.g., mechanical damage); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

This product should not present a health hazard when used under reasonable conditions. If contact with the internal components of the battery may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Burning batteries may produce toxic hydrogen fluoride gas. Fumes may cause dizziness or suffocation.

If the battery is discarded into the environment, the harmful contents inside may be dangerous.

Unknown acute toxicity

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature

Article

Chemical Name	CAS No	Weight-%
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Manganese dioxide	1313-13-9	35.5 - 47.5
Iron	7439-89-6	20.5 - 24.5
Zinc	7440-66-6	14.2 - 19.2
Water	7732-18-5	9.0 - 10.0
Potassium hydroxide	1310-58-3	4.8 - 9.8
Carbon	7440-44-0	2.8 - 3.6
Copper	7440-50-8	1.4 - 3.0
Nylon-66	32131-17-2	1.1 - 2.6

4. FIRST AID MEASURES

Description of first aid measures

General advice	No effect under routine handling and use. If exposure to internal materials within cells due to damaged outer metal casing, the following actions are recommended.
Inhalation	If inhaled, remove from exposure and move to fresh air immediately. Rinse mouth and nose with water. Get medical aid immediately. DO NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device.
Skin Contact	In case of contact, immediately flush skin with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing and shoes before reuse. Get medical aid.
Eye contact	Rinse immediately with plenty of water during at least 15-30 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses if easily possible. DO NOT rubbing eyes with hand. Get medical aid immediately.
Ingestion	Do not induce vomiting. If the injured is fully conscious: wash mouth out with water, then give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Most important symptoms and effects, both acute and delayed

See Section 11 for more information.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically and supportively.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media Dry sand or Class D extinguishing agents. If the battery is burning, water can also be submerged ignition ground.
 Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

Battery can be overheated by an external source or by internal shorting and develop metal hydroxide mist. In fire situations fumes containing manganese, Zinc, etc. may evolved. Toxic vapor may release in case of fire. Thermal shock may cause battery case to crack open. Containers may explode when heated. Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts. On some bad using conditions (e.g., mechanical damage, external short circuit.) and in case of a bad functioning, some electrolyte can be removed from the cell by the security vent. Exposure to the ingredients contained within the battery pack could be harmful under some circumstances.

Specific Extinguishing Methods

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Move containers from fire area if this can be done without risk. Prevent run off from fire control dilution from entering streams or drinking water supply.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

No action shall be taken involving any personal risk or without suitable training. Review Section 5 and Section 7 sections before proceeding with clean-up. Use proper personal protective equipment as indicated in Section 8. Appropriate ventilation.

Evacuate and ventilate spill area. Remove all sources of ignition or heat. Stop leak if safe to do so. Move containers from spill area. Keep unnecessary and unprotected personnel from entering. Review Section 5 and Section 7 sections before proceeding with clean-up.

Methods and material for containment and cleaning up

Avoid dispersal of spilled material and runoff and contact with soil, water ways, drains and sewers.

Remove all sources of ignition or heat. Stop leak if safe to do so. Move containers from spill area. Carefully collect undamaged batteries in a clean, dry and appropriate container for reuse or disposal. If electrolyte leaks or spills, collect all released material in an appropriate container before proper disposal.

7. HANDLING AND STORAGE

General Information

This product should be stored, handled and used in accordance with good industrial hygiene practices and in conformity with any legal regulation. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Precautions for safe handling

Do not dispose in fire, mix with other battery types, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents. Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case. Battery bulk container, coins, metal jewelry, metal worktable, metal belt or other equipment for assembly battery may be the source for short circuit. Use effective anti-short circuit measures. Do not use organic solvents or other chemical cleaners on battery. Do not disassembly or decompose. Avoid contacting with water, avoid straight sunlight.

Conditions for safe storage, including any incompatibilities

Store in a cool and dry area, but prevent condensation on cell or battery terminals. High temperature may damage the performance of the battery. Protect from physical damage and short circuits. To avoid risk of fire or explosion, keep sparks and other sources of ignition away from the battery. Do not allow metal objects to simultaneously contact both positive and negative terminal of batteries. Do not stack battery directly on another battery. Do not store batteries on electrically conductive surfaces.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Denmark	European Union
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.02 mg/m ³ Mn TWA: 0.1 mg/m ³ Mn	(vacated) Ceiling: 5 mg/m ³ Ceiling: 5 mg/m ³ Mn	IDLH: 500 mg/m ³ Mn TWA: 1 mg/m ³ Mn STEL: 3 mg/m ³ Mn	TWA: 0.2 mg/m ³	-
Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m ³	(vacated) Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	-
Copper (CAS #: 7440-50-8)	TWA: 0.2 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist	-	IDLH: 100 mg/m ³ dust, fume and mist IDLH: 100 mg/m ³ Cu dust and mist TWA: 1 mg/m ³ dust and mist	TWA: 1.0 mg/m ³ TWA: 0.1 mg/m ³	-

			TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist		
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Chemical Name	Latvia	France	Finland	Germany	Italy
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.3 mg/m ³	-	TWA: 0.2 mg/m ³ TWA: 0.1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 0.02 mg/m ³ Ceiling / Peak: 1.6 mg/m ³ Ceiling / Peak: 0.16 mg/m ³ TWA: 0.5 mg/m ³	-
Zinc (CAS #: 7440-66-6)	-	-	-	TWA: 0.1 mg/m ³ TWA: 2 mg/m ³ Ceiling / Peak: 0.4 mg/m ³ Ceiling / Peak: 4 mg/m ³	-
Potassium hydroxide (CAS #: 1310-58-3)	-	STEL: 2 mg/m ³	STEL: 2 mg/m ³ Ceiling: 2 mg/m ³	-	-
Copper (CAS #: 7440-50-8)	TWA: 0.5 mg/m ³ STEL: 1 mg/m ³	TWA: 0.2 mg/m ³ TWA: 1 mg/m ³ STEL: 2 mg/m ³	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	TWA: 0.01 mg/m ³ Ceiling / Peak: 0.02 mg/m ³ Ceiling / Peak: 0.2 mg/m ³	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.3 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.2 mg/m ³	TWA: 0.5 mg/m ³	-
Potassium hydroxide (CAS #: 1310-58-3)	STEL: 1 mg/m ³ TWA: 0.5 mg/m ³	Ceiling: 2 mg/m ³	STEL: 2 mg/m ³	TWA: 2 mg/m ³	-
Copper (CAS #: 7440-50-8)	-	-	-	-	TWA: 0.1 mg/m ³

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
Manganese dioxide (CAS #: 1313-13-9)	TWA: 1 mg/m ³ TWA: 0.1 mg/m ³ STEL: 1 ppm STEL: 0.1 mg/m ³	TWA: 0.5 mg/m ³	1 mg/m ³	STEL 2 mg/m ³ TWA: 0.5 mg/m ³	-
Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m ³	STEL: 2 mg/m ³	2 mg/m ³ Peak	TWA: 2 mg/m ³	-
Carbon (CAS #: 7440-44-0)	-	-	-	TWA: 5 mg/m ³	-
Copper (CAS #: 7440-50-8)	TWA: 0.1 mg/m ³ TWA: 1 mg/m ³ STEL: 0.1 mg/m ³ STEL: 1 mg/m ³	-	1 mg/m ³ 0.2 mg/m ³	STEL 4 mg/m ³ STEL 0.4 mg/m ³ TWA: 1 mg/m ³ TWA: 0.1 mg/m ³	-

Appropriate engineering controls

General room ventilation is sufficient during normal use and handling. Do not install these batteries in sealed, unventilated areas. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Remove jewelry, rings, watches and any other metallic objects while working on battery. All tools should insulate to avoid the possibility of shorting connections. DO NOT lay tools on top of the battery. The work area should be equipped with the corresponding species and quantity of fire equipment and leakage emergency equipment.

Individual protection measures, such as personal protective equipment

Respiratory protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
Hand Protection	Under normal condition of use and handling no special protection is required for sealed battery. In the event of battery case breakage, should be wear appropriate safety gloves.
Eye/face protection	Under normal condition of use and handling no special protection is required for sealed battery. Use appropriate safety glasses when there is the risk of splash.

Skin and body protection	Under normal condition of use and handling no special protection is required for sealed battery. It is recommended to wear appropriate protective clothing when the battery case is broken.
Other protection	Practice good health habits. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands, forearms and face thoroughly after handling products, before eating, smoking and using the lavatory and at the end of the working period.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid
Color	No information available
Odor	No information available
Odor Threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Boiling point / boiling range	Not determined
Flash point	Not applicable
Evaporation rate	Not determined
Flammability (solid, gas)	Not flammable
Flammability Limit in Air	Not applicable
Vapor Pressure	Not determined
Vapor density	Not applicable
Density	Not determined
Relative density	Not determined
Bulk density	Not determined
Specific gravity	Not determined
Water solubility	Insoluble in water
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not applicable
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

Other information

No information available.

10. STABILITY AND REACTIVITY

Reactivity

Stable under recommended storage and handling conditions (see SECTION 7, handling and storage).

Chemical stability

Stable under normal conditions.

Possibility of Hazardous Reactions

When a battery cell is exposed to an external short-circuit, crushed, modification, high temperature, open flames, it will be the cause of heat generation and ignition.

Conditions to avoid

Exposed to an external short-circuit, crushed, modification, high temperature, open flames, incompatible materials, direct sunlight and high humidity.

Incompatible materials

Conductive materials, water, seawater, strong oxidants, strong acid, strong bases, etc.

Hazardous Decomposition Products

In case of a fire or high temperature, metal oxides and irritating/harmful fumes/smoke may be generated.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	No effect under routine handling and use for sealed battery. If battery is broken, inhale fume and dust may cause upper respiratory irritation and lung irritation.
Eye contact	No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in irritation.
Skin Contact	No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in chemical burns.
Ingestion	No effect under routine handling and use for sealed battery. Harmful if swallowed the electrolyte contained inside the battery. Exposure to the electrolyte contained inside the battery may cause irritation to mouth, esophagus and gastrointestinal system.

Information on toxicological effects

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Manganese dioxide (CAS #: 1313-13-9)	>3480 mg/kg (Rat) male	-	-
Iron (CAS #: 7439-89-6)	98.6 g/kg bw (rat)	-	-
Potassium hydroxide (CAS #: 1310-58-3)	= 333 mg/kg (Rat)	-	-
Carbon (CAS #: 7440-44-0)	> 10000 mg/kg (Rat)	-	-
Copper (CAS #: 7440-50-8)	> 2500 mg/kg bw(rat)	> 2000 mg/kg bw(rat)	=1.03 mg/L/4 h(rat)

Skin corrosion/irritation

No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in chemical burns.

Serious eye damage/eye irritation

No effect under routine handling and use for sealed battery. Exposure to the electrolyte contained inside the battery may result in irritation.

Sensitization

No sensitization responses were observed.

Germ cell mutagenicity

No information available.

Carcinogenicity

All compositions in this product are not listed as carcinogens by ACGIH, IARC, NTP, or CA Prop 65.

Reproductive toxicity

No information available.

STOT - single exposure

No information available.

STOT - repeated exposure

No information available.

Aspiration hazard

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Manganese dioxide (CAS #: 1313-13-9)	> 100 other: v/v saturated solution 72h <i>Desmodesmus subspicatus</i>	> 100 other: % v/v saturated solution 96h <i>Oncorhynchus mykiss</i>	> 100 other: % v/v saturated solution 48h <i>Daphnia magna</i>
Iron (CAS #: 7439-89-6)	-	13.6: 96 h <i>Morone saxatilis</i> mg/L LC50 static	> 100 mg/L/48h (<i>Daphnia magna</i>)
Zinc (CAS #: 7440-66-6)	-	LC50 - <i>Daphnia magna</i> (Water flea) - 0.068 mg/l - 48 h	LC50 - <i>Daphnia magna</i> (Water flea) - 0.068 mg/l - 48 h
Potassium hydroxide (CAS #: 1310-58-3)	-	80mg/L/96h <i>Gambusia affinis</i> static	-
Copper (CAS #: 7440-50-8)	0.031 - 0.054 mg/L/96h <i>Pseudokirchneriella subcapitata</i> static 0.0426 - 0.0535 mg/L/72h <i>Pseudokirchneriella subcapitata</i> static	1.25: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 0.3: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static 0.8: 96 h <i>Cyprinus carpio</i> mg/L LC50 static 0.112: 96 h <i>Poecilia reticulata</i> mg/L LC50 flow-through 0.0068 - 0.0156: 96 h <i>Pimephales promelas</i> mg/L LC50 0.3: 96 h <i>Pimephales promelas</i> mg/L LC50 static 0.2: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 0.052: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through	-

Persistence and degradability

No information available.

Bioaccumulative potential

Chemical Name	Partition coefficient (LogPow)
Manganese dioxide (CAS #: 1313-13-9)	<0
Potassium hydroxide (CAS #: 1310-58-3)	0.83

Chemical name	Bioconcentration factor (BCF)
Zinc (CAS #: 7440-66-6)	466

Mobility in soil

No information available.

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging

Contaminated packaging material should be treated equivalent to residual chemical. Clean packaging material should be subjected to waste management schemes (recovery recycling, reuse) according to local legislation. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. TRANSPORT INFORMATION

UN/ID No.	Not regulated
Proper shipping name	Not regulated
Hazard Class	Not regulated
Packing Group	Not regulated
Special precautions	Batteries must be separated from each other and prevent movement that could lead to short-circuits. Products must also be packed in strong packaging that can withstand the rigors normal to transportation.
Marine pollutant	Non-marine pollutant

Note:

According to NO.MLIHFQZU71112711 Certification for Safe Transport of Chemical Goods, the substance is not subject to IATA DGR. The goods are packaged according to the packaging requirement of ordinary goods. Such batteries must be packed in inner packagings in such a manner as to effectively prevent short circuits and to prevent movement which could lead to short circuits.

According to NO.MZIFCAYN29140711 Certification for Safe Transport of Chemical Goods, the substance is not subject to IMO IMDG Code. The goods are packaged according to the packaging requirement of ordinary goods. Such batteries must be packed in inner packagings in such a manner as to effectively prevent short circuits and to prevent movement which could lead to short circuits.

Packaging information: The product is packed in plastic bags, then use cartons for outer packing.

Shipping Notice: Packaging is intact and transport is secure. Avoid the physical damage of the packaging.

15. REGULATORY INFORMATION

International Inventories

Component	AICS	DSL/NDSL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Manganese dioxide 1313-13-9 (35.5 - 47.5)	X	X	X	X	X	X	X	X
Iron 7439-89-6 (20.5 - 24.5)	X	X	X	Expected	X	X	X	X
Zinc 7440-66-6 (14.2 - 19.2)	X	X	X	Expected	X	X	X	X
Water 7732-18-5 (9.0 - 10.0)	X	X	X	Expected	X	X	X	X
Potassium hydroxide 1310-58-3 (4.8 - 9.8)	X	X	X	X	X	X	X	X
Carbon 7440-44-0 (2.8 - 3.6)	X	X	X	Expected	X	X	X	X
Copper 7440-50-8 (1.4 - 3.0)	X	X	X	Expected	X	X	X	X
Nylon-66 32131-17-2 (1.1 - 2.6)	X	X	-	X	X	X	X	X

"-" Not Listed

"X" Listed

US Federal Regulations

SARA 313

Chemical Name	SARA 313 - Threshold Values %
Manganese dioxide - 1313-13-9	1.0
Zinc - 7440-66-6	1.0

CWA (Clean Water Act)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Zinc 7440-66-6	-	X	X	-
Potassium hydroxide 1310-58-3	1000 lb	-	-	X
Copper 7440-50-8	-	X	X	-

CERCLA

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Zinc 7440-66-6	1000 lb	-	RQ 454 kg final RQ RQ 1000 lb final RQ
Potassium hydroxide 1310-58-3	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Manganese dioxide 1313-13-9	X	-	X
Zinc 7440-66-6	X	X	X
Potassium hydroxide 1310-58-3	X	X	X
Copper 7440-50-8	X	X	-

16. OTHER INFORMATION**Revision Note**

Issue Date 03-Nov-2017
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Revision Note Not applicable

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA - TWA (time-weighted average)

STEL - STEL (Short Term Exposure Limit)

Ceiling - Maximum limit value

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

Disclaimer

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

----- End of Safety Data Sheet -----

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