SAFETY DATA SHEET

For

Dongguan Large Electronics Co., Ltd.

Floor 5, Block A, Gosun Science Park, Longxi Road 5, Zhouxi, Nancheng District, Dongguan City, Guangdong, China.

And for their product

Zinc-Manganese Dry Battery

Model/type reference .....: R03

Nominal Voltage .....: 1.5V

Version number .....: V2.0

Revision date .....: 2019-12-25

Effective date .....: 2020-01-01 ~ 2020-12-31

Prepared by .....: **Shenzhen NTEK Testing Technology Co., Ltd.**
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Shenzhen NTEK Testing Technology Co., Ltd. NTEK Report Seal Marco Huang Jesse Zhang

Section 1- Identification of the Substance/Preparation and of the Company/Undertaking

Product Identifier

Product Name: Zinc-Manganese Dry Battery

Model No.: R03

Other means of identification

Synonyms: None

Recommended use of the chemical and restrictions on use

Recommended Use: Carbon Zinc Battery

Uses advised against: No information available

Details of the supplier of the safety data sheet

Manufacturer's / Supplier Name: Dongguan Large Electronics Co., Ltd.

Address: Floor 5, Block A, Gosun Science Park, Longxi Road 5, Zhouxi, Nancheng District, Dongguan City, Guangdong, China.

Telephone number of the manufacturer/supplier: +86-769-28055192

Emergency Telephone Number (24h): +86-769-28055192

E-mail address: sunfeilin@juda.cn

Section 2 – Hazards Identification

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) this product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Specific target organ toxicity (repeated exposure)	Category 2
Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Gases)	Category 4

GHS Label elements, including precautionary statements

Emergency Overview

Signal word: Danger

Hazard Statements

Harmful if swallowed

Harmful if inhaled

Causes severe skin burns and eye damage

May cause damage to organs through prolonged or repeated exposure

This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold.
Intended use of the product should not result in exposure to the chemical substance This is a battery. In case of rupture: the above hazards exist.

Appearance Red and black **Physical State** Solid **Odor** Odorless

Precautionary Statements - Prevention	Wash face, hands and any exposed skin thoroughly after handling Do not eat, drink or smoke when using this product Use only outdoors or in a well-ventilated area Do not breathe dust/fume/gas/mist/vapors/spray Wear protective gloves/protective clothing/eye protection/face protection
Precautionary Statements - Response	Immediately call a POISON CENTER or doctor/physician Specific treatment (see supplemental first aid instructions on this label)
Eyes	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing Immediately call a POISON CENTER or doctor/physician
Skin	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower Wash contaminated clothing before reuse
Inhalation	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing Call a POISON CENTER or doctor/physician if you feel unwell Immediately call a POISON CENTER or doctor/physician
Ingestion	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell Rinse mouth Do NOT induce vomiting
Precautionary Statements - Storage	Store locked up
Precautionary Statements - Disposal	Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)	Not applicable
Unknown	-

Toxicity	
Other information	Very toxic to aquatic life with long lasting effects
Interactions with Other Chemicals	No information available

Section 3 – Composition/Information on Ingredients

Chemical Name	CAS Number	Weight-%	Trade Secret
Zinc	7440-66-6	27-31	*
Manganese Dioxide	1313-13-9	29-33	*
Carbon	7440-44-0	9-12	*
Zinc Chloride	7646-85-7	6	
Ammonium chloride	12125-02-9	1.5	
Water	7732-18-5	13-17	*
Copper	7440-50-8	1	
Iron	7439-89-6	2-3	*
Polypropylene	9003-07-0	3-4	*

* The exact percentage (concentration) of composition has been withheld as a trade secret.

Section 4 – First-aid Measures

General Advice	First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. **Eye contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Seek immediate medical attention/advice. **Skin contact:** Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek immediate medical attention/advice. **Inhalation:** Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get medical attention immediately if symptoms occur.

	Ingestion: Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. **Self-protection of the first aider:** Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Use personal protective equipment as required. Wear personal protective clothing (see section 8).
Most important symptoms and effects, both acute and delayed	**Most important symptoms and effects:** Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.
Indication of any immediate medical attention and special treatment needed	**Notes to Physician:** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

Section 5 – Fire-fighting Measures

Suitable extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing Media	CAUTION: Use of water spray when fighting fire may be inefficient.
Specific Hazards arising from the chemical	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
Hazardous Combustion Products	Carbon oxides.
Explosion Data	**Sensitivity to Mechanical Impact:** No. **Sensitivity to Static Discharge:** No.
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.

Section 6 – Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	**Personal Precautions:** Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Avoid breathing vapors

	or mists. Avoid generation of dust. Do not breathe dust. **Other Information:** Refer to protective measures listed in Sections 7 and 8.
Environmental Precautions	Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.
Methods and material for containment and cleaning up	**Methods for Containment:** Prevent further leakage or spillage if safe to do so. **Methods for cleaning up:** Pick up and transfer to properly labeled containers.

Section 7 – Handling and Storage

Precautions for safe handling	**Handling:** In case of rupture. Use only with adequate ventilation and in closed systems. Avoid contact with skin, eyes or clothing.
Conditions for safe storage, including any incompatibilities	**Storage:** Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials. **Incompatible Products:** Acids. Bases. Oxidizing agent.

Section 8 – Exposure Controls and Personal Protection

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Manganese dioxide 1313-13-9	TWA: 0.02 mg/m³ Mn TWA: 0.1 mg/m³ Mn	(vacated) Ceiling: 5 mg/m³ Ceiling: 5 mg/m³ Mn	IDLH: 500 mg/m³ Mn TWA: 1 mg/m³ Mn STEL: 3 mg/m³ Mn
Zinc 7440-66-6	STEL: 10 mg/m³ respirable fraction TWA: 2 mg/m³ respirable fraction	TWA: 5 mg/m³ fume TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction	IDLH: 500 mg/m³ Ceiling: 15 mg/m³ dust TWA: 5 mg/m³ dust and fume STEL: 10 mg/m³ fume
Zinc chloride 7646-85-7	STEL: 2 mg/m³ fume TWA: 1 mg/m³ fume	TWA: 1 mg/m³ fume (vacated) TWA: 1 mg/m³ fume (vacated) STEL: 2 mg/m³ fume	IDLH: 50 mg/m³ fume TWA: 1 mg/m³ fume STEL: 2 mg/m³ fume
Ammonium	STEL: 20 mg/m³	(vacated) TWA: 10 mg/m³	TWA: 10 mg/m³ fume

chloride 12125-02-9	fume TWA: 10 mg/m³ fume	fume (vacated) STEL: 20 mg/m³, fume	STEL: 20 mg/m³ fume
Copper 7440-50-8	TWA: 0.2 mg/m³ fume TWA: 1 mg/m³ Cu dust and mist	TWA: 0.1 mg/m³ fume TWA: 1 mg/m³ dust and mist (vacated) TWA: 0.1 mg/m³ Cu, dust, fume, mist	IDLH: 100 mg/m³ dust, fume and mist TWA: 1 mg/m³ dust and mist TWA: 0.1 mg/m³ fume

**ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits NIOSH IDLH Immediately Dangerous to Life or Health*

Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992) See section 15 for national exposure control parameters

Appropriate engineering controls	**Engineering Measures:** Showers Eyewash stations Ventilation systems.
Individual protection measures, such as personal protective equipment	**Eye/Face Protection:** Face protection shield. **Skin and Body Protection:** Wear protective gloves and protective clothing. Long sleeved clothing. Chemical resistant apron. Impervious gloves. **Respiratory Protection:** No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required. **Hygiene Measures:** Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. For environmental protection, remove and wash all contaminated protective equipment before re-use. Do not breathe dust.

Section 9 - Physical and Chemical Properties

Physical Properties	**Physical state:** Solid
	Appearance: Red and Black and Cylinder
	Color: Red and Black
	Odor: Odorless
	Odor Threshold: No information available

Chemical Properties:		
Property	**Values**	**Remarks/ Method**
pH	No data available	None known
Melting / freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash Point	No data available	None known
Evaporation Rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air **Upper flammability limit** **Lower flammability limit**	 No data available No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Specific Gravity	No data available	None known
Water Solubility	Insoluble in water	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	0.0001	None known
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	0.0001	None known
Explosive properties	No data available	
Oxidizing Properties	No data available	

Other Information

Softening Point	No data available
VOC Content (%)	No data available
Particle Size	No data available

Particle Size Distribution	No data available

Section 10 - Stability and Reactivity

Reactivity	No data available.
Chemical stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	None under normal processing.
Hazardous Polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Exposure to air or moisture over prolonged periods. Excessive heat.
Incompatible materials	Acids. Bases. Oxidizing agent.
Hazardous Decomposition Products	Carbon oxides.

Section 11 - Toxicological Information

Information on likely routes of exposure

Product Information	Product does not present an acute toxicity hazard based on known or supplied information. In case of rupture:.
Inhalation	Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract. Harmful by inhalation.
Eye Contact	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.
Skin Contact	Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.
Ingestion	Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea,

	vomiting and diarrhea. May be harmful if swallowed.

Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Manganese dioxide 1313-13-9	= 9000 mg/kg (Rat)		
Zinc chloride 7646-85-7	= 350 mg/kg (Rat)		
Iron 7439-89-6	= 984 mg/kg (Rat)		
Ammonium chloride 12125-02-9	= 1410 mg/kg (Rat)		

Information on toxicological effects	**Symptoms:** Erythema (skin redness). Burning. May cause blindness. Coughing and/ or wheezing.
Delayed and immediate effects as well as chronic effects from short and long-term exposure	**Sensitization:** No information available. **Mutagenic Effects:** No information available. **Carcinogenicity:** The table below indicates whether each agency has listed any ingredient as a carcinogen

Reproductive Toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).
Chronic Toxicity	No known effect based on information supplied. Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Contains a known or suspected carcinogen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse effects on the bone marrow and blood-forming system.
Target Organ Effects	Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Central Vascular System (CVS).Kidney. Liver. Lungs. Heart.
Aspiration Hazard	No information available.

Numerical measures of toxicity Product Information

The values which are on the right are calculated based on chapter 3.1 of the GHS document.	No information available.

Section 12 - Ecological Information

Ecotoxicity

Toxic to aquatic life with long lasting effects.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Zinc 7440-66-6	96h EC50: 0.11 - 0.271 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.09 - 0.125 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 2.16 - 3.05 mg/L (Pimephales promelas) 96h LC50: 0.211 - 0.269 mg/L (Pimephales promelas) 96h LC50: = 2.66 mg/L (Pimephales promelas) 96h LC50: = 30 mg/L (Cyprinus carpio) 96h LC50: = 0.45 mg/L (Cyprinus carpio) 96h LC50: = 7.8 mg/L (Cyprinus carpio) 96h LC50: = 3.5 mg/L (Lepomis macrochirus) 96h LC50: = 0.24 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.59 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.41 mg/L (Oncorhynchus mykiss)		48h EC50: 0.139 - 0.908 mg/L
Iron 7439-89-6		96h LC50: = 13.6 mg/L, (Morone saxatilis)		

Ammonium chloride 12125-02-9		96h LC50: = 209 mg/L (Cyprinus carpio) 24h LC50: = 725 mg/L (Lepomis macrochirus)		24h LC50: = 202 mg/L
Copper 7440-50-8	96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas)		48h EC50: = 0.03 mg/L

Bioaccumulation

Chemical Name	Log Pow
Manganese dioxide 1313-13-9	<0

Section 13 – Disposal Considerations

Waste treatment methods

Disposal methods: Should not be released into the environment.

Contaminated Packaging: Dispose of contents/containers in accordance with local regulations.

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste
Zinc 7440-66-6	Ignitable powder Toxic
Zinc chloride 7646-85-7	Toxic Corrosive
Copper 7440-50-8	Toxic

Section 14 – Transport Information

Product Name: Zinc-Manganese Dry Battery

Model No.: R03

DOT	NOT REGULATED **Proper Shipping Name:** N/A **Hazard Class:** N/A
TDG	Not regulated
MEX	Not regulated
ICAO	Not regulated
IATA	NOT REGULATED **Proper Shipping Name:** N/A **Hazard Class:** N/A
IMDG/IMO	NOT REGULATED **Proper Shipping Name:** N/A **Hazard Class:** N/A
RID	Not regulated
ADR	Not regulated
ADN	Not regulated

Air transport：

The battery according to Special Provision A123 of IATA DGR 61st edition for transportation.

Sea transport：

The battery according to International Maritime Dangerous Goods (IMDG) Code (Amendment 39-18Edition)

Section 15 - Regulatory Information

International Inventories

TSCA: Complies

DSL: All components are listed either on the DSL or NDSL.

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

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

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Manganese dioxide - 1313-13-9	1313-13-9	27-31	1.0
Zinc - 7440-66-6	7440-66-6	23-27	1.0
Copper - 7440-50-8	7440-50-8	1	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Zinc 7440-66-6		X	X	
Zinc chloride 7646-85-7	1000 lb	X		X
Ammonium chloride 12125-02-9	5000 lb			X
Copper 7440-50-8		X	X	

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Zinc 7440-66-6	1000 lb		RQ 454 kg final RQ RQ 1000 lb final RQ
Zinc chloride 7646-85-7	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ
Ammonium	5000 lb		

chloride 12125-02-9			RQ 5000 lb final RQ RQ 2270 kg final RQ
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 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	Rhode Island	Illinois
Manganese dioxide 1313-13-9			X	X	X
Zinc 7440-66-6	X	X	X	X	
Carbon 7440-44-0			X		
Zinc chloride 7646-85-7	X	X	X	X	
Ammonium chloride 12125-02-9	X	X	X	X	
Copper 7440-50-8	X	X	X	X	X

International Regulations

Mexico

National occupational exposure limits

Component	Carcinogen Status	Exposure Limits
Manganese dioxide 1313-13-9 (27 - 31)		Mexico: TWA= 0.2 mg/m³
Copper 7440-50-8 (1)		Mexico: TWA= 1 mg/m³ Mexico: TWA= 0.2 mg/m³ Mexico: STEL= 2 mg/m³

Mexico - Occupational Exposure Limits - Carcinogens

Canada

WHMIS Hazard Class

Non-controlled

Section 16 - Other Information

NFPA	**Health Hazards** 1	**Flammability** 0	**Instability** 0	**Physical and Chemical Hazards** - **Personal Protection** X
HMIS	**Health Hazards** 0	**Flammability** 0	**Physical Hazard** 0	

Revision Note: No information available

Disclaimer

The information provided in this 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--