PAK KO BATTERIES FACTORY LIMITED
Unit 11, 9/F., Block A, Hoi Luen Ind. Ctr., No. 55 Hoi Yuen Rd., Kwun Tong, Kln., H.K.
Tel.: (852) 2345-5245 Fax.: (852) 2797-9591 E-mail: pakko@pakkobatteries.com
http://www.pakkobatteries.com

SAFETY DATA SHEET

PRODUCT NAME: Mercury Free Carbon Zinc Battery Series

Model No: R6 R03 R14 R20 6F22

Volts: 1.5 / cell **Document Number: PAKKO2017Rseries**

Batteries are articles as defined under the GHS and exempt from GHS classification criteria (Section 1.3.2.1.1 of the GHS). The information and recommendations set forth herein are made in good faith, for information only, and are believed to be accurate as of the date of preparation.

SECTION 1 - MANUFACTURER INFORMATION

Pak Ko Batteries Factory Limited
Unit 11, 9/F., Block A, Hoi Luen Industrial Centre,
No.55, Hoi Yuen Road, Kwun Tong, Kowloon,
Hong Kong.

Telephone Number for Information: 852-23455245

Date Prepared: June 2017

SECTION 2 – HAZARDS IDENTIFICATION

GHS Classification: N/A

Signal Word: N/A

Hazard Classification: N/A

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.
Inhalation: Contents of an open battery can cause respiratory irritation.
Skin Contact: Contents of an open battery can cause skin irritation and/or chemical burns.

Eye Contact: Contents of an open battery can cause severe irritation and chemical burns.

SECTION 3 - INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/wt.
Carbon Black (CAS# 1333-86-4)	3.5 mg/m^3 TWA (as carbon black)	3.5 mg/m^3 TWA (as carbon black)	5
Manganese Dioxide (CAS# 1313-13-9)	5 mg/m^3 Ceiling (as Mn)	0.2 mg/m^3 TWA (as Mn)	31
Ammonium Chloride (CAS# 12125-02-9)	None established	10 mg/m^3 TWA (fume) 20 mg/m^3 STEL (fume)	1

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Zinc (CAS# 7440-66-6)	15 mg/m^3 TWA Particulates not otherwise regulated (total dust) 5 mg/m^3 TWA Particulates not otherwise regulated (respirable fraction)	10 mg/m^3 TWA Particulates not otherwise classified (inhalable particulate) 3 mg/m^3 TWA Particulates not otherwise classified (respirable particulate)	33
Zinc Chloride (CAS# 7646-85-7)	1 mg/m^3 TWA (fume)	1 mg/m^3 TWA (fume) 2 mg/m^3 STEL (fume)	6
Iron (CAS# 7439-89-6)	None established	None established	24

SECTION 4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately.
Inhalation: Provide fresh air and seek medical attention.
Skin Contact: Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.
Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

SECTION 5 - FIRE FIGHTING MEASURES

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.
Fire fighters should wear self-contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

To cleanup leaking batteries:

Ventilation Requirements: Room ventilation may be required in areas where there are open or leaking batteries.

Eye Protection: Wear safety glasses with side shields if handling an open or leaking battery.
Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.
Battery materials should be collected in a leak-proof container.

SECTION 7 - HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices.

If soldering or welding to the battery is required, consult your battery manufacturer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

WARNING: do not install backwards, charge, put in fire, or mix with other battery types. May explode or leak causing injury. **Replace all batteries at the same time.**

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SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions.
Respiratory Protection: Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions.
Gloves: Not necessary under normal conditions.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Solid object
Upper Explosive Limits:	Not applicable for an Article
Lower Explosive Limits	Not applicable for an Article
Odor	No odor
Vapor Pressure (mm Hg @ 25°C)	Not applicable for an Article
Odor Threshold	No odor
Vapor Density (Air = 1)	Not applicable for an Article
pH	Not applicable for an Article
Density (g/cm^3)	2.0-3.0
Melting point/Freezing Point	Not applicable for an Article
Solubility in Water (% by weight)	Not applicable for an Article
Boiling Point @ 760 mm Hg (°C)	Not applicable for an Article
Flash Point	Not applicable for an Article
Evaporation Rate (Butyl Acetate = 1)	Not applicable for an Article
Flammability	Not applicable for an Article
Partition Coefficient	Not applicable for an Article
Auto-ignition Temperature	Not applicable for an Article
Decomposition Temperature	Not applicable for an Article

Viscosity	Not applicable for an Article

SECTION 10 – STABILITY AND REACTIVITY

Zinc manganese dioxide batteries do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

SECTION 11 – TOXICOLOGICAL INFORMATION

Under normal conditions of use, zinc manganese dioxide batteries are non-toxic.

SECTION 12 – ECOLOGICAL INFORMATION

Issues such as ecotoxicity, persistence and bioaccumulation are not applicable for articles.

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable federal, state and local regulations. Appropriate disposal technologies include incineration and land filling

SECTION 14 – TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for zinc manganese dioxide batteries has been designed to be compliant with these regulatory concerns.

Zinc manganese dioxide batteries (sometimes referred to as “Dry cell” batteries) are not listed as dangerous goods under the ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road, the IMDG International Maritime Dangerous Goods Code, UN Dangerous Good Regulations, IATA Dangerous Goods Regulations, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR). These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following special provisions.

Regulatory Body	Special Provisions
ADR	Not regulated
IMDG	Not regulated
UN	Not regulated
US DOT	49 CFR 172.102 Provision 130
IATA	A123
ICAO	Not regulated

All zinc manganese dioxide batteries are packed in such a way to prevent short circuits or the generation dangerous quantities of heat and meet the special provisions listed above. In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words “not restricted” and the Special Provision number A123 be provided on the air waybill, when an air waybill is issued.

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SECTION 15 - REGULATORY INFORMATION

Zinc manganese dioxide batteries are not classified as dangerous goods by the US Department of Transportation or the major international regulatory bodies and are therefore not regulated.

SARA/TITLE III - As an article, this battery and its contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

SECTION 16 - OTHER INFORMATION

None.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section I – Product and Company Identification

Information of Product

Product Identity (used on the label)	Cylindrical Alkaline Battery – LR20, LR14, LR6, LR03

Information of Manufacturer

Manufacturer's Name GPI International Ltd.	**Emergency Telephone Number** Within USA & Canada call: +1-800-424-9300 Outside USA and Canada call: +1-703-527-3887
Address (Number, Street, City State, and ZIP Code) 8/F GP Building, 30 Kwai Wing Road, Kwai Chung, N.T., Hong Kong	**Telephone Number for Information** +852-24843333
	Date of prepared and revised 26th May 2015

Recommended use of chemicals:

N.A.

Section II – Hazards Identification

Hazards identifications

General advice: The common known rules for handling of chemicals should be obeyed. These chemicals are contained in a sealed steel can. For consumer use, adequate hazard warnings are printed on both the package and the battery. Potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically or electrically abused. Concentrated potassium hydroxide contained is caustic. Anticipated potential leakage of potassium hydroxide is 2-20 ml, depending on battery size. Do not eat and drink batteries. Keep batteries away from small children.

Physical-Chemical Hazards: This preparation is not classified as dangerous according to the criteria of directive 99/45/EEC.

Hazards to man: If battery leaking, exposure to caustic ingredients may occur. Therefore, may cause sensitization by skin contract.

Hazards to environment: N.A.

Remark: "N.A." is indicated if not applicable.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section III – Composition/Information on Ingredients

Chemical Nature: Alkaline zinc-manganese dioxide batteries

Ingredient	CAS No.	Approximate %/wt			
		LR03	LR6	LR14	LR20
Manganese Dioxide (MnO2)	1313-13-9	40.9	42.6	40.6	41.8
Zinc (Zn)	7440-66-6	14.8	16.1	16.0	17.4
Water (H2O)	7732-18-5	11.7	12.2	11.0	11.1
Potassium Hydroxide (KOH)	1310-58-3	4.8	5.2	7.0	7.0
Graphite	7782-42-5	1.7	3.0	3.2	3.4
Brass	12597-71-6	3.0	2.4	1.2	0.8
Steel	7439-89-6	20.4	15.7	18.6	16.3
Ni-plating	7440-02-0	0.3	0.3	0.2	0.2
Nylon-66	None	1.5	1.6	1.6	1.4
Fiber	None	0.9	0.9	0.6	0.6
Mercury (Hg)	7439-97-6	<0.0001	<0.0001	<0.0001	<0.0001
Lead (Pb)	7439-92-1	<0.0030	<0.0030	<0.0030	<0.0030
Cadmium (Cd)	7440-43-9	<0.0003	<0.0003	<0.0003	<0.0003
Arsenic (As)	7440-38-2	<0.0001	<0.0001	<0.0001	<0.0001

Section IV – First-aid Measures

Inhalation: In case of excessive inhalation due to leaking batteries remove to fresh air. Obtain medical advice.

Skin Contact: If exposed to a leaking battery, remove contaminated clothing. Wash exposed areas with plenty of water and soap. If irritation occurs, consult a physician.

Eye contact: If a battery is leaking and materials contact eyes, flush immediately with running water for at least 15 minutes. Consult an ophthalmologist at once.

Ingestion: Not anticipated due to size of batteries. Choking may occur with the smaller size batteries. If exposed to a leaking battery, rinse mouth and surrounding areas with running water for at least 15 minutes. Give plenty of water to drink. Do not induce vomiting. Obtain medical advice.

Remark: "N.A." is indicated if not applicable.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section V – Fire-fighting Measures

Suitable extinguishing media: Carbon dioxide (CO_2), foam, dry chemical powder.

Extinguishing media not to be used: Never use a direct water jet.

Exposure hazards from combustion products: In case of fire, carbon dioxide, carbon monoxide and other toxic organic substances will be generated. Do not inhale fumes and smoke.

Personal protective equipments: Wear full protective clothing. Use self-contained breathing apparatus.

Section VI – Accidental Release Measures

Personal precautions: Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured batteries. Avoid eye or skin contact and inhalation of vapours. Increase the ventilation. Wear protective clothing. Keep unprotected persons away.

Environmental precautions: Avoid discharge and penetration into sewerage systems, waterways, pits, and cellars.

Methods for cleaning up: Collect spilled material with an insert standard absorbent like sand or silica. Care for well-ventilated conditions. Recycle or dispose of the materials in an appropriate way.

Section VII – Handling and Storage

General handling:

Obey the common known rules and precautions for handling with chemicals. Avoid mechanical and electrical abuse. Do not short battery or install incorrectly. Batteries may explode, pyrolize or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries according to equipment instructions. Do not mix battery systems, such as alkaline and zinc- carbon. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag. Do not remove battery labels.

Storage:

Store product in well-filled, appropriate coated and tightly closed containers avoiding influence of oxygen/air, light and humidity. Storage at room temperature.

Section VIII – Exposure Controls/Personal Protection

Exposition/Technical measures: Atmospheric vapour concentrations must be minimized by adequate ventilation.

Protection of hands, eyes and skin: None required under normal use conditions. When handling leaking batteries, use neoprene, rubber or nitrile gloves and wear safety glasses to protect hands, eyes and skin.

General safety and hygiene measures: Use only as directed.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section IX – Physical and Chemical Properties

Physical state: Stainless steel top battery Colour: Contents dark and gray in colour
Odour: N.A.
Melting point: N.A.
Boiling point: N.A.
Flash point: N.A.
Explosion limit: Not available
Ignition temperature: Not available
Vapour pressure: Not available
Specific gravity: N.A.
Solubility in water: N.A.
Solubility in other solvents: N.A.
PH value: Not available
Partition coefficient: Not available
Viscosity: Not available

Section X – Stability and Reactivity

Thermal decomposition: Batteries may burst and release hazardous decomposition products when exposed to fire.
Substances to avoid: Strong oxidation agents.
Hazardous reactions: Contents incompatible with strong oxidizing agents.
Hazardous decomposition products: Thermal degradation may produce hazardous fumes of zinc and manganese; hydrogen gas; caustic vapors of potassium hydroxide and other toxic by-products.

Section XI – Toxicological Information

Toxicity information is available on the battery ingredients noted in Section III, but in general, N.A. to intact batteries

Chronic health effects: N.A.

Section XII – Ecological Information

Not available.

Section XIII – Disposal Considerations

Product: Dispose in accordance with appropriate regulations. If in doubt, contact your local government office concerned for information. Do not incinerate, since batteries may explode at excessive temperatures.

Remark: "N.A." is indicated if not applicable.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section XIV – Transport Information

Road (ADR/RID): Not regulated

Air (ICAO/IATA):

IATA DGR（55th）: Special Provision A123: “Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery ... having the potential of a dangerous evolution of heat must be prepared for transport as to prevent (a) a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals...) is forbidden from transport; and (b) accidental activation. The words “Not Restricted” and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.”

Sea (IMDG):

IMDG CODE:Special Provision 304 which says: “Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if 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”

These batteries are not regulated by international agencies as hazardous materials or dangerous goods when shipped. A shipping name of “Alkaline Batteries – Non-hazardous” may be used on all domestic and international bills of lading.

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for GP alkaline batteries has been designed to be compliant with these regulatory concerns.

Section XV – Regulatory Information

Symbol: N.A.

EC labeling: None

Risk phrases: None

Safety phrases: None

Labeling is not required because cylindrical alkaline batteries are classified as “ articles “ under the Dangerous Preparations Directive and as such are exempt from the requirements of the Directive.

Remark: “N.A.” is indicated if not applicable.

GP Batteries

Safety Data Sheet for Cylindrical Alkaline Battery

Document Number: SDS100 Revision: 00 Date of prepared: 26 May 2015

Section XVI – Other Information

The information on this Safety Date Sheet (SDS) was obtained form current and reputable sources. However, the data is provided without any warranty; expressed or implied, regarding its correctness or accuracy. It is the user's responsibility to assume liability on loss, injury, damage, or expense resulting from improper use of this product. Any previous MSDS of this product mentioned above are hereby replaced with this new document. We urge you to make this information available as appropriate in your organization and to any others with whom you arrange to handle this product.

Remark: "N.A." is indicated if not applicable.

SAFETY DATA SHEET

HCS-2012 APPENDIX D TO §1910.1200

Version 1 **Issue Date** 14-May-2015
Product Name Alkaline battery LR03 AAA AM4 (Mercury free) **Revision date** 14-May-2015

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

Product identifier

Product Name	Alkaline battery LR03 AAA AM4 (Mercury free)
Product Description	Mercury Free Alkaline Zinc Manganese Dry Battery
Product Model	LR03

Other means of identification

Synonyms	Product type: alkaline battery Voltage: 1.5 V Ampere hour: 650MAH Content of Li: None

Recommended use of the chemical and restrictions on use

Recommended Use	Energy Source
Uses advised against	No information available

Details of the supplier of the safety data sheet

Importer	WUXI CITY BAOLAI BATTERY CO., LTD
Address	NORTH INDUSTRIAL ZONE, HUANSHI STREET, QIANZHOU TOWN, WUXI CITY
Phone	+86-510-83397086
FAX	+86-510-83397091
E-mail	wxbaolai@126.com

Emergency telephone number

+86-510-83397086

2. HAZARDS IDENTIFICATION

GHS Classification

Not classified

Label elements

Symbols/Pictograms	None
Signal word	None
Hazard Statements	Not classified
Precautionary Statements	
Prevention	Not applicable
Response	Not applicable
Storage	Not applicable
Disposal	Not applicable

Hazards not otherwise classified (HNOC)

No information available

Unknown acute toxicity

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature Article

Chemical Name	CAS No	Weight-%
Manganese dioxide	1313-13-9	36 - 41
Zinc	7440-66-6	15 - 20
Steel Sheet	7439-89-6	17.08
Water	7732-18-5	9.36
Potassium hydroxide	1310-58-3	6.99
Graphite	7782-42-5	3.30
Copper Nail	7440-50-8	1.91
Zinc Oxide	1314-13-2	0.70

4. FIRST AID MEASURES

Description of first aid measures

General advice: If symptoms persist, call a physician.

Inhalation: Not an expected route of exposure. If battery is leaking, contents may be irritating to respiratory passages. Move to fresh air. If irritation persists, seek 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.

Eye contact: Not an expected route of exposure. If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 30 minutes. Seek immediate medical advice.

Ingestion: Not an expected route of exposure. If battery contents are swallowed, do not induce vomiting. If the victim is alert, have them rinse their mouth are the surrounding skin with water for at least 15 minutes. Seek immediate medical attention.

Most important symptoms and effects, both acute and delayed

No information available.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO_2). Dry chemical.

Unsuitable extinguishing media: No information available.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors

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

Evacuate personnel to safe areas
Ensure adequate ventilation, especially in confined areas
Remove all sources of ignition
Use personal protection recommended in Section 8
Avoid contact with skin, eyes or clothing

Do not touch or walk through spilled material
Caustic potassium hydroxide may be released from leaking or ruptured batteries.
Avoid breathing vapors or mists

Methods and material for containment and cleaning up

Pick up and transfer to properly labeled containers

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice
Wash thoroughly after handling
Avoid mechanical or electrical abuse.
DO NOT short circuit or install incorrectly.
Batteries may explode pyrolize 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.
Take precautionary measures against static discharges
Do not eat, drink or smoke when using this product

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place
Keep away from heat
Do not refrigerate – this will not make them last longer.

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	-
Graphite (CAS #: 7782-42-5)	TWA: 2 mg/m^3 respirable fraction all forms except graphite fibers	-	IDLH: 1250 mg/m^3 TWA: 2.5 mg/m^3 natural respirable dust	TWA: 2.5 mg/m^3	-
Copper Nail (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: 0.1 mg/m^3 fume TWA: 1 mg/m^3 Cu dust and mist	TWA: 1.0 mg/m^3 TWA: 0.1 mg/m^3	-
Zinc Oxide (CAS #: 1314-13-2)	STEL: 10 mg/m^3 respirable fraction TWA: 2 mg/m^3 respirable fraction	TWA: 5 mg/m^3 fume TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 5 mg/m^3 fume (vacated) TWA: 10 mg/m^3 total dust (vacated) TWA: 5 mg/m^3 respirable fraction (vacated) STEL: 10	IDLH: 500 mg/m^3 Ceiling: 15 mg/m^3 dust TWA: 5 mg/m^3 dust and fume STEL: 10 mg/m^3 fume	TWA: 4 mg/m^3	-

		mg/m^3 fume			

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	-	-
Graphite (CAS #: 7782-42-5)	TWA: 2 mg/m^3	TWA: 2 mg/m^3	TWA: 2 mg/m^3	TWA: 1.5 mg/m^3 TWA: 4 mg/m^3	-
Copper Nail (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	-
Zinc Oxide (CAS #: 1314-13-2)	TWA: 0.5 mg/m^3	TWA: 5 mg/m^3 TWA: 10 mg/m^3	TWA: 2 mg/m^3 STEL: 10 mg/m^3	TWA: 1 mg/m^3 TWA: 0.1 mg/m^3 TWA: 2 mg/m^3 Ceiling / Peak: 2 mg/m^3 Ceiling / Peak: 0.4 mg/m^3 Ceiling / Peak: 4 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 Nail (CAS #: 7440-50-8)	-	-	-	-	TWA: 0.1 mg/m^3
Zinc Oxide (CAS #: 1314-13-2)	STEL: 10 mg/m^3 TWA: 5 mg/m^3	STEL: 10 mg/m^3 TWA: 2 mg/m^3	STEL: 10 mg/m^3 TWA: 2 mg/m^3	STEL: 3 mg/m^3 TWA: 3 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	-
Graphite (CAS #: 7782-42-5)	TWA: 5 mg/m^3 TWA: 2 mg/m^3 TWA: 10 mg/m^3 TWA: 4 mg/m^3 STEL: 5 mg/m^3 STEL: 2 mg/m^3 STEL: 10 mg/m^3 STEL: 4 mg/m^3	-	3 mg/m^3	STEL 10 mg/m^3 TWA: 5 mg/m^3	-
Copper Nail (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	-
Zinc Oxide (CAS #: 1314-13-2)	TWA: 5 mg/m^3 STEL: 10 mg/m^3	-	10 mg/m^3 5 mg/m^3 10 mg/m^3 STEL	TWA: 5 mg/m^3	-

Appropriate engineering controls

Ventilation systems

Individual protection measures, such as personal protective equipment

Respiratory protection	None required for normal use.
Hand Protection	None required for normal use. Use neoprene, rubber or latex gloves when handling leaking batteries.
Eye/face protection	None required for normal use. Wear safety goggles when handling leaking batteries.
Skin and body protection	None required for normal use. Use neoprene, rubber or latex gloves when handling leaking batteries.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid, cylindrical
Color	Black and golden
Odor	Odorless
Odor Threshold	Not determined
pH	Not determined
Melting point/freezing point	Not determined
Boiling point / boiling range	Not determined
Flash point	Not determined
Evaporation rate	Not determined
Flammability (solid, gas)	Not determined
Flammability Limit in Air	Not determined
Vapor Pressure	Not determined
Vapor density	Not determined
Density	Not determined
Relative density	Not determined
Bulk density	Not determined
Specific gravity	Not determined
Water solubility	Not determined
Partition coefficient (LogPow)	Not determined
Autoignition temperature	Not determined
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

Other information

Voltage	1.5V

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

None under normal processing

Conditions to avoid

Flames, sparks, and other sources of ignition, incompatible materials.

Incompatible materials

Oxidizing agents, acid, base.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide, lithium oxide fumes.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.
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.
Ingestion	Swallowing is not anticipated due to battery size. Choking may occur if smaller AAA batteries are swallowed. Ingestion of battery contents (from a leaking battery) may cause mouth, throat and intestinal burns and damage.

Information on toxicological effects

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Manganese dioxide (CAS #: 1313-13-9)	= 9000 mg/kg (Rat)	-	-
Steel Sheet (CAS #: 7439-89-6)	98.6 g/kg bw (rat)	-	-
Water (CAS #: 7732-18-5)	> 90 mL/kg (Rat)	-	-
Potassium hydroxide (CAS #: 1310-58-3)	= 333 mg/kg (Rat)	-	-
Copper Nail (CAS #: 7440-50-8)	> 2500 mg/kg bw(rat)	> 2000 mg/kg bw(rat)	=1.03 mg/L/4 h(rat)
Zinc Oxide (CAS #: 1314-13-2)	> 5000 mg/kg (Rat)	-	-

Skin corrosion/irritation

Non-irritating to the skin

Serious eye damage/eye irritation

No eye irritation

Sensitization

No information available

Germ cell mutagenicity

No information available

Carcinogenicity

No information available

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
Steel Sheet (CAS #: 7439-89-6)	-	13.6: 96 h Morone saxatilis mg/L LC50 static	> 100 mg/L/48h (Daphnia magna)
Zinc (CAS #: 7440-66-6)	0.11 - 0.271 mg/L/96h Pseudokirchneriella subcapitata static 0.09 - 0.125 mg/L/72h Pseudokirchneriella subcapitata static	2.16 - 3.05 mg/L/96h Pimephales promelas flow-through 0.211 - 0.269 mg/L/96h Pimephales promelas semi-static 2.66: mg/L/96h Pimephales promelas static 30 mg/L/96h Cyprinus carpio 0.45 mg/L/96h Cyprinus carpio semi-static 7.8 mg/L/96h Cyprinus carpio static 3.5 mg/L/96h Lepomis macrochirus static 0.24 mg/L/96h Oncorhynchus mykiss flow-through 0.59 mg/L/96h Oncorhynchus mykiss semi-static 0.41 mg/L/96h Oncorhynchus mykiss static	0.139 - 0.908 mg/L/48h Daphnia magna Static
Potassium hydroxide (CAS #: 1310-58-3)	-	80mg/L/96h Gambusia affinis static	-
Copper Nail (CAS #: 7440-50-8)	0.031 - 0.054 mg/L/96h Pseudokirchneriella subcapitata static 0.0426 - 0.0535 mg/L/72h Pseudokirchneriella subcapitata static	1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.3: 96 h Cyprinus carpio mg/L LC50 semi-static 0.8: 96 h Cyprinus carpio mg/L LC50 static 0.112: 96 h Poecilia reticulata mg/L LC50 flow-through 0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.3: 96 h Pimephales promelas mg/L LC50 static 0.2: 96 h Pimephales promelas mg/L LC50 flow-through 0.052: 96 h Oncorhynchus mykiss 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)	0.65

Mobility in soil

No information available

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes — Disposal should be in accordance with applicable regional, national and local laws and regulations

Contaminated packaging Dispose of in accordance with federal, state and local regulations

14. TRANSPORT INFORMATION

DOT

UN/ID No. Not regulated
Proper shipping name Not regulated
Hazard Class Not regulated
Packing Group Not regulated
Special precautions No information available
Marine pollutant Not applicable

15. REGULATORY INFORMATION

International Inventories

Component	AICS	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	TSCA
Manganese dioxide 1313-13-9	X	X	X	X	X	X	X	X
Steel Sheet 7439-89-6	X	X	X	-	X	X	X	X
Zinc 7440-66-6	X	X	X	-	X	X	X	X
Water 7732-18-5	X	X	X	-	X	X	X	X
Potassium hydroxide 1310-58-3	X	X	X	X	X	X	X	X
Graphite 7782-42-5	X	X	X	-	X	X	X	X
Copper Nail 7440-50-8	X	X	X	-	X	X	X	X
Zinc Oxide 1314-13-2	X	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
Zinc Oxide - 1314-13-2	1.0

SARA 311/312 Hazard Categories

Not apply

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 Nail 7440-50-8	-	X	X	-
Zinc Oxide 1314-13-2	-	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

Not apply

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
Graphite 7782-42-5	X	X	-
Copper Nail 7440-50-8	X	X	-
Zinc Oxide 1314-13-2	X	X	X

16. OTHER INFORMATION

Revision Note

Issue Date	14-May-2015
Revision date	14-May-2015
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 --------

Safety Data Sheet

According to HCS-2012 APPENDIX D TO §1910.1200

Version: 1.0/EN
Product name: **ALKALINE BATTERY**

Revision date: 29/04/2015
Issue date: 25/05/2015

1. Identification

(a) Product identifier

Product name: ALKALINE BATTERY

(b) Other means of identification

Product description: Model: LR03, LR6, LR14, LR20, LR1, 6LR61
Nominal Voltage:1.5V

(c) Recommended use of the chemical and restrictions on use

Recommended use: ALKALINE BATTERY
Restriction on use: No information available.

(d) Details of the supplier of the product

Company name(China) NINGHAI HENGJIU BATTERY CO., LTD
Address: NO.158 Xidian South Road, Xidian Town, Ninghai Country, Ningbo, Zhejiang, China. P.R.C
E-mail: hjcell@163.com
Telephone: +86-13958247688

(e) Emergency phone number

+86-13958247688

2. Hazard(s) identification

(a) 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 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (repeated exposure) Category	Category 1

(b) GHS Label elements, including precautionary statements

Emergency Overview

Signal word **Danger**

Hazard Statements

Causes skin irritation

Causes serious eye damage

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: Black **Physical State:** Solid **Odor:** Odorless

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Do not breathe dust/fume/gas/mist/vapors/spray
Do not eat, drink or smoke when using this product

Precautionary Statements - Response

Specific treatment (see supplemental first aid instructions on this label)
Get medical advice/attention if you feel unwell

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: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

Precautionary Statements - Storage

No information available.

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

(c) Hazards not otherwise classified (HNOC)

No information available.

(d) Unknown Toxicity

10% of the mixture consists of ingredient(s) of unknown toxicity.

(e) Other information

No information available.

(f) Interactions with Other Chemicals

No information available.

3. Composition/information on ingredients

(a) Mixtures information

Chemical name	CAS No.	Concentration%
Manganese dioxide	1313-13-9	36
Graphite	7782-42-5	4
Potassium hydroxide	1310-58-3	6
Zinc	7440-66-6	20
Iron	7439-89-6	20
brass	12597-71-6	3
Water	7732-18-5	11

4. First-aid measures

(a) Description of first aid measures

General Advice First aid is upon rupture of sealed battery.

Eye contact: Show this safety data sheet to the doctor in attendance.
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area.

Skin contact: Remove contaminated clothes and rinse the skin with plenty of water. Get medical advice / attention if you feel unwell.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, (trained personnel should) give oxygen. Get medical advice / attention if you feel unwell.

Ingestion: Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical aid.

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.

(b) Most important symptoms/effects, acute and delayed

Contact with internal components may cause allergic skin sensitization (rash) and irritate eyes, skin, nose, throat, respiratory system. Cobalt and Cobalt compounds are considered to be possible human carcinogen(s).

(c) Immediate medical attention and special treatment

No information available.

5. Fire-fighting measures

(a) Extinguishing media

Suitable extinguishing media: Use foam, dry powder or dry sand, CO_2 as appropriate.

Unsuitable extinguishing media: No information available.

(b) Special hazards arising from the chemical

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO,

CO_2, Metal oxides, Irritating fumes.

(c) Special protective equipment and precautions for fire-fighters

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filter mask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish extinguishment.

6. Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area, dispose the case after the batteries cool and vapors dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors.

(b) Environmental Precautions

Prevent material from contaminating soil and from entering sewers or waterways.

(c) Methods and materials for containment and cleaning up

If the battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

7. Handling and storage

(a) Precautions for safe handling

Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries Use recommended charging time and current.

(b) Conditions for safe storage, including any incompatibilities

If the battery is subject to storage for such a long term as more than 3 months, it is recommended at -10℃~45℃ for 1 month storage, at -10℃~35℃ for 3 months storage. Do not storage the battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. Keep out of reach of children.

8. Exposure controls/personal protection

(a)Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Graphite 7782-42-5	TWA: 2 mg/m^3 (Respirable fraction)	15 mppcf (Z-3)	TWA: 2.5 mg/m^3

Potassium hydroxide 1310-58-3	CEIL: 2 mg/m^3	CEIL: 2 mg/m^3	CEIL: 2 mg/m^3
Zinc 7440-66-6	Not established	Not established	Not established
Iron 7439-89-6	Not established	Not established	Not established

ACGIH TLV: American Conference of Governmental Industrial Hygienists -Threshold Limit Value
OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits 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

(b) Appropriate engineering controls

Engineering Measures: 1.Showers
2.Eyewash stations
3.Ventilation systems

(c) Individual protection measures, such as personal protective equipment

Eye/Face Protection: Not necessary under normal conditions, wear safety glasses if handling an open or leaking battery.

Skin and body Protection: Not necessary under normal conditions, Wear protective gloves and protective clothing such as long sleeved clothing, impervious gloves, chemical resistant apron, and antistatic boots if handling an open or leaking battery.

Respiratory Protection: Not necessary under normal 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. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink, or smoke in work area. Maintain good housekeeping.

9. Physical and chemical properties

(a) Appearance	Black Solid
(b) Odor	Odorless
(c) Odor threshold	Not available.
(d) pH	Not available.
(e) Melting point/freezing point	Not available.
(f) Initial boiling point and boiling range	Not available.
(g) Flash point	Not applicable.
(h) Evaporation rate	Not applicable.
(i) Flammability	Non flammable.
(j) Upper/lower flammability or explosive limits	Not available.
(k) Vapor pressure	Not applicable.
(l) Vapor density	Not available.
(m) Relative density	Not available.

(n) Solubility(ies)	Insoluble in water.
(o) Partition coefficient: n-octanol/water	Not available.
(p) Auto-ignition temperature	130℃
(q) Decomposition temperature	Not available.
(r) Viscosity	Not available.

10. Stability and reactivity

(a) Reactivity

Stable under recommended storage and handling conditions.

(b) Chemical stability

Stable under normal conditions.

(c) Possibility of hazardous reactions

When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies controlled release of pressure without ignition.

(d) Conditions to avoid

Do not subject the battery to mechanical shock. Keep away from open flames, high temperature.

(e) Incompatible materials

Strong oxidizer, strong acid.

(f) Hazardous decomposition products

Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

11. Toxicological information

(a) Information on the likely routes of exposure

Inhalation:	Inhalation of a large number of vapors or fumes released due to heat may cause respiratory.
Ingestion:	Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.
Skin contact:	Contact with battery electrolyte may cause burns and skin irritation.
Eye contact:	Contact with battery electrolyte may cause burns. Eye damage is possible.

Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 4. Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up.

(b) Information on toxicological characteristics

Acute toxicity:	No data available.
Skin corrosion/irritation:	The liquid in the battery irritates.
Serious eye damage/irritation:	The liquid in the battery irritates.
Respiratory sensitization:	The liquid in the battery may cause sensitization to some person.
Skin sensitization:	The liquid in the battery may cause sensitization to some person.
Carcinogenicity:	Cobalt and Cobalt compounds are considered to be possible human carcinogen(s).

Germ Cell Mutagenicity:	No data available.
Reproductive Toxicity:	No data available.
STOT-Single Exposure:	No data available.
STOT-Repeated Exposure:	No data available.
Aspiration Hazard:	No data available.

(c) Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization:	No data available.
Mutagenic Effects:	No data available.
Carcinogenicity:	No data available.
Reproductive Toxicity:	No data available.
Chronic Toxicity:	No data available.
Target Organ Effects:	No data available.
Aspiration Hazard:	No data available.

12. Ecological information

(a) Ecotoxicity

Water hazard class 1(Self-assessment): slightly hazardous for water.

(b) Persistence and Degradability

No information available.

(c) Bioaccumulative potential

No information available.

(d) Mobility in soil

No information available.

(e) Other adverse effects

No information available.

13. Disposal considerations

Safe handling and methods of disposal

Disposal should be in accordance with applicable regional, national and local laws and regulations.
Local regulations may be more stringent than regional or national requirements.
Product disposal recommendation: Observe local, state and federal laws and regulations.
Packaging disposal recommendation: Be aware discarded batteries may cause fire, tape the battery terminals to insulate them. Don't disassembly the battery. Completely discharge containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations.
The potential effects on the environment and human health of the substances used in batteries and accumulators; the desirability of not disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection so as to facilitate treatment and recycling.

14. Transport information

Alkaline battery are unregulated for purpose of transportation by the U.S. Department of Transportation(DOT), International Civil Aviation Administration(ICAO), International Air Transport Association(IATA) and International maritime Dangerous Goods Regulations(IMDG). The only DOT requirement for shipping these batteries is special provision A67 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). As of 1/1/97 IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement could lead to short-circuitig.”

15. Regulatory information

OSHA hazard communication standard (29 CFR 1910.1200)

_____ ***Hazardous*** _____√_____ ***Non-hazardous***

16. Other information, including date of preparation or last revision

(a) Preparation and revision information

Date of previous revision: Not applicable. Date of this revision: 29/04/2015

Revision summary: The first New SDS

(b) Abbreviations and acronyms

TSCA:	Toxic Substances Control Act, The American chemical inventory.
DSL	Domestic Substances List
EINECS:	European Inventory of Existing Commercial chemical Substances
ENCS	Japanese Existing and New Chemical Substances
ECL:	Existing Chemicals List, the Korean chemical inventory.
IECSC:	Inventory of existing chemical substances in China.

(c) Disclaimer

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard. The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

---------- End of the SDS ----------