

## Material Safety Data Sheet

Client	DONGGUAN JIN LU BATTERY TECHNOLOGY CO., LTD.
Add. of Client	15#Rome Road QingXi Town, DongGuan City, GuanDong Province, China.
Description	Li-ion Battery
Model /Type	185595
Manufacturer	DONGGUAN JIN LU BATTERY TECHNOLOGY CO., LTD.
Add. of Manufacturer	15#Rome Road QingXi Town, DongGuan City, GuanDong Province, China.
Nominal Voltage	11.1V
Capacity	3800mAh
Wh rating	42.18Wh
Date of Receipt	2019-08-02

Laboratory Shenzhen ZRLK Testing Technology Co., Ltd.  
Address 6F, Fuxinfa Industrial Park, Liuxiandong, Xili Street, Nanshan District, Shenzhen, China

Approved Signatory Barry Peng

*Barry Peng*

Inspected by Ailis.Ma

*Ailis Ma*

Censored by Lahm Peng

*Lahm Peng*





## Section 1- Chemical Product and Company Identification

### 1. Chemical Product Identification

Product name: Li-ion Battery

Model: 185595

### 2. Company Identification

Manufacturer /Supplier Name: DONGGUAN JIN LU BATTERY TECHNOLOGY CO., LTD.

Address: 15#Rome Road QingXi Town, DongGuan City, GuanDong Province, China.

Telephone number of the supplier: 0086-15014897261

Emergency Telephone No.(24h): 0086-15014897261

e-mail address: deco2877@126.com

This MSDS was prepared by Shenzhen ZRLK Testing Technology Co., Ltd.

Referenced documents: ISO 11014:2009 Safety data sheet for chemical products;

## Section 2 – Hazards Identification

Preparation hazards and classification	When the battery is In extreme pressure deformation, high-temperature environment, overload, short-circuit condition, or disassemble the battery, an explosion of fire and chemical burn hazards may occur.
Apperance, Color, and Odor	Solid object with no odor, no color.
Primary Route(s) of Exposure	These chemicals are contained in a sealed stainless steel enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact
Potential Health Effects:	<b>ACUTE (short term):</b> see Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns. <b>Inhalation:</b> A battery volatilizes no gas unless it was damaged. Damaged battery will volatilize little gas that may stimulate the respiratory tract or cause an anaphylaxis in serious condition. <b>Ingestion:</b> Swallowing battery will be Damaged to the respiratory tract and Cause chemical burns to the stomach; in serious conditions it will cause Permanent damage. <b>Skin:</b> In normal condition, Contact between the battery and skin will not cause any harms. Contact with a damaged battery may cause skin allergies or chemical burns. <b>Eye:</b> in normal condition, Contact between the battery and eyes will not cause any harms. However, the gas Volatilize from a damaged battery may be harmful to eyes. <b>CHRONIC (long term):</b> see Section 11 for additional toxicological data
Medical Conditions Aggravated by Exposure	Not applicable
Reported as carcinogen	Not applicable

### Section 3 – Composition/Information on Ingredients

Li-ion Battery is a mixture.

Hazardous Ingredients (Chemical Name)	Concentration or concentration ranges (%)	CAS Number
Lithium Cobalt Oxide (LiCoO <sub>2</sub> )	35.5	12190-79-3
Aluminum Foil (Al)	9	7429-90-5
1,1-Difluoroethylene polymer	1	24937-79-9
Graphite (C)	18	7782-42-5
Copper Foil (Cu)	15	7440-50-8
Styrene-Butadiene polymer	1.5	9003-55-8
Phosphate(1-), hexafluoro-, lithium	2.8	21324-40-3
Ethylene carbonate	5	96-49-1
Dimelene carbonate	5	616-38-6
Carbonate, methyl ethyl	5	623-53-0
Nickel	2.2	7440-02-0

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

(\*)Main ingredients: Lithium hexafluorophosphate, organic carbonates

### Section 4 – First-aid Measures

<b>Inhalation</b>	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.
<b>Skin contact</b>	If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
<b>Eye contact</b>	If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.
<b>Ingestion</b>	If ingestion of contents of an open battery occurs, never give anything by mouth if victim



	is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. <b>DO NOT INDUCE VOMITING.</b> Have victim drink 60 to 240 mL (2-8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.
--	---

## Section 5 – Fire-fighting Measures

Flammable Properties	In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.
Suitable extinguishing Media	Use extinguishing media suitable for the materials that are burning.
Unsuitable extinguishing Media	Not available
Explosion Data	<b>Sensitivity to Mechanical Impact:</b> This may result in rupture in extreme cases <b>Sensitivity to Static Discharge:</b> Not Applicable
Specific Hazards arising from the chemical	Fires involving <b>Li-ion Battery</b> can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire
Protective Equipment and precautions for firefighters	As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance. Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.
NFPA	Health: 0 Flammability: 0 Instability: 0

## Section 6 – Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.
Environmental Precautions	Prevent material from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.



Methods and materials for cleaning up	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.
---------------------------------------	--

## Section 7 – Handling and Storage

Handling	<p>Do not dismantle, open or shred secondary <b>Li-ion Battery</b>;</p> <p>Don't handling Li-ion Battery with metalwork. Do not open, disassemble, crush or burn battery. Ensure good ventilation/ exhaustion at the workplace.</p> <p>Prevent formation of dust.</p> <p>Information about protection against explosions and fires: Keep ignition sources away- Do not smoke.</p>
Storage	<p>If the <b>Li-ion Battery</b> is subject to storage for such a long term as more than 3 months, it is recommended to recharge the <b>Li-ion Battery</b> periodically.</p> <p>3 months: -10°C~+40°C, 45 to 85%RH</p> <p>And recommended at 0°C~+35°C for long period storage.</p> <p>The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.</p> <p>Do not storage <b>Li-ion Battery</b> haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.</p> <p>Keep out of reach of children.</p> <p>Do not expose <b>Li-ion Battery</b> to heat or fire. Avoid storage in direct sunlight.</p> <p>Do not store together with oxidizing and acidic materials.</p>

## Section 8 – Exposure Controls and Personal Protection

Engineering Controls	<p>Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor.</p> <p>Keep away from heat and open flame. Store in a cool, dry place.</p>
----------------------	--



Personal Protective Equipment	<p><b>Respiratory Protection:</b> Not necessary under normal conditions.</p> <p><b>Skin and body Protection:</b> Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery.</p> <p><b>Hand protection:</b> Wear neoprene or natural rubber material gloves if handling an open or leaking battery.</p> <p><b>Eye Protection:</b> Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.</p>
Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the immediate work area.
Hygiene Measures	Do not eat, drink, or smoke in work area. Maintain good housekeeping.

## Section 9 - Physical and Chemical Properties

Physical State	Form: Prismatic
	Odour: Monotony
Change in condition:	
pH, with indication of the concentration	Not applicable
Melting point/freezing point	Not available.
Boiling Point, initial boiling point and Boiling range:	Not available.
Flash Point	Not available.
Upper/lower flammability or explosive limits	Not available.
Vapor Pressure:	Not applicable
Vapor Density: (Air = 1)	Not applicable
Density/relative density	Not available.
Solubility in Water:	Insoluble
n-octanol/water partition coefficient	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Odour threshold	Not available.
Evaporation rate	Not available.
Flammability (soil, gas)	Not available.



Viscosity	Not applicable
-----------	----------------

## Section 10 - Stability and Reactivity

Stability	The product is stable under normal conditions.
Conditions to Avoid (e.g. static discharge, shock or vibration)	Do not subject <b>Li-ion Battery</b> to mechanical shock. Vibration encountered during transportation does not cause leakage, fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.
Incompatible Materials	Not Available
Hazardous Decomposition Products	This material may release toxic fumes if burned or exposed to fire
Possibility of Hazardous Reaction	Not Available

## Section 11 - Toxicological Information

In normal condition, contact with the battery is non-toxic.

## Section 12 - Ecological Information

General note:	Water hazard class 1(Self-assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Anticipated behavior of a chemical product in environment/possible environmental impact/ecotoxicity.	Not Available
Mobility in soil	Not Available
Persistence and Degradability	Not Available
Bioaccumulation potential	Not Available
Other Adverse Effects	Not Available

## Section 13 – Disposal Considerations



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;

## **Section 14 – Transport Information**

This report applies to by sea, by air and by land;

The Li-ion Battery must be of a design type proved to meet the testing requirements of the Manual of test and criteria, Part III, subsection 38.3;

The Li-ion Battery according to Section II of PACKING INSTRUCTION 965-967 of the 2019 IATA Dangerous Goods regulations 60<sup>th</sup> Edition may be transported. and applicable U.S. DOT regulations for the safe transport of Lithium-ion Battery.

Li-ion Battery was protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit;

Cell and batteries offered for transport must be packed in inner packaging's that completely enclose the cell or battery; to provide protection from damage or compression to the batteries, the inner packaging's must be placed in a strong rigid outer packaging;

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

The package must be handled with care and that a flammability hazard exists if the package is damaged;

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions.
- The International Air transport Association (IATA) Dangerous Goods Regulations.

UN number of lithium battery: UN3480;

UN Proper shipping name/Description (technical name): Lithium ion batteries;

- The International Maritime Dangerous Goods Code 2018 Edition (Amdt.39-18)

For lithium-ion batteries by sea, provided that packaging is strong and prevent the products from short-circuit.

UN number of lithium battery: UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries

Special Provision: International maritime dangerous goods code (IMDG) 188, 230, 310, 348, 957;

- The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA
- The Office of Hazardous Materials Safety within the US Department of Transportations' (DOT) Research and Special Programs Administration (RSPA)

## **Section 15 - Regulatory Information**





OSHA hazard communication standard (29 CFR 1910.1200)

\_\_\_\_\_ Hazardous

\_\_\_\_\_  Non-hazardous

## **Section 16 - Other Information**

The information above is believed to be accurate and represents the best information currently available to us. however, concorde makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. users should make their own investigations to determine the suitability of the information for their particular purposes. although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. this material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

\*\*\*\*\*The End\*\*\*\*\*

# SAFETY DATA SHEET

HCS-2012 APPENDIX D TO §1910.1200

Version 1  
Product Name ALKALINE BATTERY - LR6

Issue Date 10-Mar-2015  
Revision date 10-Mar-2015

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

### Product identifier

Product Name ALKALINE BATTERY - LR6  
Chemical Name ALKALINE BATTERY

### Other means of identification

Product Code LR6 1.5V 2300mAh

### Recommended use of the chemical and restrictions on use

Recommended Use Power supply  
Uses advised against No information available

### Details of the supplier of the safety data sheet

Supplier SUZHOU XINLVZHOU ELECTRONICS CO., LTD  
Address Yangcheng Lake West Road, No777, Xiangcheng District, SuZhou City, Jiangsu Province, China.  
Postal Code -  
Phone +86-512-68702665  
FAX +86-512-68669435  
E-mail qky006@lvzhoudianzi.com.cn

### Emergency telephone number

+86-512-68702665

## 2. HAZARDS IDENTIFICATION

### GHS Classification

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

### Label elements

Symbols/Pictograms None  
Signal word None  
Hazard Statements None  
Precautionary Statements  
Prevention None  
Response None  
Storage None  
Disposal None

### Hazards not otherwise classified (HNOC)

No information available

### Unknown acute toxicity

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

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature Mixture

Chemical Name	CAS No	Weight-%
---------------	--------	----------

Manganese dioxide	1313-13-9	15 - 40
Zinc	7440-66-6	15 - 40
Steel	12597-69-2	10 - 30
Zinc oxide	1314-13-2	3 - 7
Graphite	7782-42-5	1 - 5
Copper	7440-50-8	1 - 5
Acrylic resin	9003-01-4	0.1 - 1
Water	7732-18-5	0.1 - 1
Potassium hydroxide	1310-58-3	0.1 - 1
Polypropylene	9003-07-0	0.1 - 1
Calcium stearate	1592-23-0	0.1 - 1
Indium hydroxide (In(OH)3)	20661-21-6	0.1 - 1

#### 4. FIRST AID MEASURES

##### Description of first aid measures

General advice	Remove contaminated clothing and shoes. If symptoms persist, call a physician.
Inhalation	Not an expected route of exposure. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Skin Contact	Wash hands thoroughly after handling. .
Eye contact	Not an expected route of exposure. .
Ingestion	Rinse mouth Get medical attention Never give anything by mouth to an unconscious person

##### 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 Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
 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

##### Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so  
 Pick up and transfer to properly labeled containers

Avoid release to the environment

## 7. HANDLING AND STORAGE

### Precautions for safe handling

- Handle in accordance with good industrial hygiene and safety practice
- Ensure adequate ventilation, especially in confined areas
- Avoid creating dust
- Avoid contact with eyes
- Wash thoroughly after handling
- Use personal protection recommended in Section 8

### Conditions for safe storage, including any incompatibilities

- Keep containers tightly closed in a dry, cool and well-ventilated place
- Keep away from heat

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### Exposure Limits

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Denmark	European Union
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.02 mg/m <sup>3</sup> Mn TWA: 0.1 mg/m <sup>3</sup> Mn	(vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> Mn	IDLH: 500 mg/m <sup>3</sup> Mn TWA: 1 mg/m <sup>3</sup> Mn STEL: 3 mg/m <sup>3</sup> Mn	TWA: 0.2 mg/m <sup>3</sup>	-
Zinc oxide (CAS #: 1314-13-2)	STEL: 10 mg/m <sup>3</sup> respirable fraction TWA: 2 mg/m <sup>3</sup> respirable fraction	TWA: 5 mg/m <sup>3</sup> fume TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 5 mg/m <sup>3</sup> fume (vacated) TWA: 10 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) STEL: 10 mg/m <sup>3</sup> fume	IDLH: 500 mg/m <sup>3</sup> Ceiling: 15 mg/m <sup>3</sup> dust TWA: 5 mg/m <sup>3</sup> dust and fume STEL: 10 mg/m <sup>3</sup> fume	TWA: 4 mg/m <sup>3</sup>	-
Graphite (CAS #: 7782-42-5)	TWA: 2 mg/m <sup>3</sup> respirable fraction all forms except graphite fibers	-	-	TWA: 2.5 mg/m <sup>3</sup>	-
Copper (CAS #: 7440-50-8)	TWA: 0.2 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> Cu dust and mist	-	-	TWA: 1.0 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	-
Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m <sup>3</sup>	(vacated) Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	-
Calcium stearate (CAS #: 1592-23-0)	TWA: 10 mg/m <sup>3</sup> except stearates of toxic metals	-	-	-	-
Indium hydroxide (In(OH) <sub>3</sub> ) (CAS #: 20661-21-6)	TWA: 0.1 mg/m <sup>3</sup> In	-	-	TWA: 0.1 mg/m <sup>3</sup>	-

Chemical Name	Latvia	France	Finland	Germany	Italy
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.3 mg/m <sup>3</sup>	-	TWA: 0.2 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> TWA: 0.02 mg/m <sup>3</sup> Ceiling / Peak: 1.6 mg/m <sup>3</sup> Ceiling / Peak: 0.16 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	-

Zinc (CAS #: 7440-66-6)		-	-	TWA: 0.1 mg/m <sup>3</sup> TWA: 2 mg/m <sup>3</sup> Ceiling / Peak: 0.4 mg/m <sup>3</sup> Ceiling / Peak: 4 mg/m <sup>3</sup>	-
Zinc oxide (CAS #: 1314-13-2)	TWA: 0.5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> TWA: 10 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup> TWA: 2 mg/m <sup>3</sup> Ceiling / Peak: 1 mg/m <sup>3</sup> Ceiling / Peak: 0.4 mg/m <sup>3</sup> Ceiling / Peak: 4 mg/m <sup>3</sup>	-
Potassium hydroxide (CAS #: 1310-58-3)	-	STEL: 2 mg/m <sup>3</sup>	STEL: 2 mg/m <sup>3</sup> Ceiling: 2 mg/m <sup>3</sup>	-	-

Chemical Name	Poland	Portugal	Spain	Switzerland	Netherlands
Manganese dioxide (CAS #: 1313-13-9)	TWA: 0.3 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	-
Zinc oxide (CAS #: 1314-13-2)	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	STEL: 10 mg/m <sup>3</sup> TWA: 2 mg/m <sup>3</sup>	STEL: 10 mg/m <sup>3</sup> TWA: 2 mg/m <sup>3</sup>	STEL: 3 mg/m <sup>3</sup> TWA: 3 mg/m <sup>3</sup>	-
Potassium hydroxide (CAS #: 1310-58-3)	STEL: 1 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	Ceiling: 2 mg/m <sup>3</sup>	STEL: 2 mg/m <sup>3</sup>	TWA: 2 mg/m <sup>3</sup>	-
Calcium stearate (CAS #: 1592-23-0)	-	TWA: 10 mg/m <sup>3</sup>	TWA: 10 mg/m <sup>3</sup>	-	-

Chemical Name	Norway	United Kingdom	Australia	Austria	Belgium
Manganese dioxide (CAS #: 1313-13-9)	TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup> STEL: 3 ppm STEL: 0.3 mg/m <sup>3</sup>	TWA: 0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	STEL 2 mg/m <sup>3</sup> TWA: 0.5 mg/m <sup>3</sup>	-
Zinc oxide (CAS #: 1314-13-2)	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	-	10 mg/m <sup>3</sup> 5 mg/m <sup>3</sup> 10 mg/m <sup>3</sup> STEL	TWA: 5 mg/m <sup>3</sup>	-
Graphite (CAS #: 7782-42-5)	-	-	3 mg/m <sup>3</sup>	STEL 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-
Copper (CAS #: 7440-50-8)	-	-	1 mg/m <sup>3</sup> 0.2 mg/m <sup>3</sup>	STEL 4 mg/m <sup>3</sup> STEL 0.4 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	-
Potassium hydroxide (CAS #: 1310-58-3)	Ceiling: 2 mg/m <sup>3</sup>	STEL: 2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup> Peak	TWA: 2 mg/m <sup>3</sup>	-
Calcium stearate (CAS #: 1592-23-0)	-	-	10 mg/m <sup>3</sup>	-	-
Indium hydroxide (In(OH)3) (CAS #: 20661-21-6)	-	-	0.1 mg/m <sup>3</sup>	STEL 0.2 mg/m <sup>3</sup> TWA: 0.1 mg/m <sup>3</sup>	-

**Appropriate engineering controls**

- Showers
- Eyewash stations
- Ventilation systems

**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 Wear protective gloves.
- Eye/face protection No special technical protective measures are necessary.
- Skin and body protection Wear suitable protective clothing.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

Appearance	Solid
Color	metallic
Odor	Odorless
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 determined
Flammability Limit in Air	Not determined
Vapor Pressure	Not applicable
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**

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**

None under normal processing

**Conditions to avoid**

Strong heating. Incompatible materials

**Incompatible materials**

Strong acids Strong bases Strong oxidizing agents

**Hazardous Decomposition Products**

None known based on information supplied

**11. TOXICOLOGICAL INFORMATION****Information on likely routes of exposure**

Inhalation	Inhalation of vapors in high concentration may cause irritation of respiratory system
Eye contact	Contact with eyes may cause irritation
Skin Contact	Substance may cause slight skin irritation Ingestion may cause irritation to mucous membranes

**Information on toxicological effects****Acute toxicity**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Manganese dioxide (CAS #: 1313-13-9)	= 9000 mg/kg ( Rat )	-	-
Zinc oxide (CAS #: 1314-13-2)	> 5000 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)
Acrylic resin (CAS #: 9003-01-4)	10250 mg/kg (rat, carbomer 910) 4100 mg/kg (rat, carbomer 943)	3 g/kg (rat, carbomer 910)	1.71 mg/L (rat)
Potassium hydroxide (CAS #: 1310-58-3)	= 333 mg/kg (Rat)	-	-
Calcium stearate (CAS #: 1592-23-0)	> 10 g/kg ( Rat )	-	-
Polypropylene (CAS #: 9003-07-0)	>5 g/kg	-	-

**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
---------------	---------------------------	-----------	----------------

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
Zinc oxide (CAS #: 1314-13-2)	-	1.1 mg/l/96h	0.098 mg/l/48h Daphnia magna
Copper (CAS #: 7440-50-8)	0.031 - 0.054 mg/L/96h Pseudokirchneriella subcapitata static 0.0426 - 0.0535 mg/L/72h Pseudokirchneriella subcapitata static	-	-
Potassium hydroxide (CAS #: 1310-58-3)	-	80mg/L/96h Gambusia affinis static	-

**Persistence and degradability**

No information available

**Bioaccumulative potential**

Chemical Name	Partition coefficient (LogPow)
Manganese dioxide (CAS #: 1313-13-9)	<0

**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

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

Chemical Name	California Hazardous Waste Status
Zinc 7440-66-6	Ignitable powder Toxic
Zinc oxide 1314-13-2	Toxic
Copper 7440-50-8	Toxic
Potassium hydroxide 1310-58-3	Toxic Corrosive



Indium hydroxide (In(OH) <sub>3</sub> ) 20661-21-6	Toxic
---	-------

## 14. TRANSPORT INFORMATION

The batteries are considered to be "Dry cell" batteries and are unregulated for purpose of transportation by the U.S. DOT, ICAO, IATA and IMDG. The only DOT requirement for shipping these batteries is special provision 130 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). The only requirement for shipping these batteries by ICAO and IATA is Special Provision A123 which states: " An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation." The international Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under 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 provision of this Code provided the batteries are securely packed and protected against short-circuits. Example of such batteries are : alkali-manganese, zinc carbon, nickel metal hydride and nickel-cadmium batteries. Such battery have been packed in inner packaging in such a manner as to effectively prevent short circuit and movement that could lead to short-circuit.

### DOT / IMDG / IATA

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

## 15. REGULATORY INFORMATION

### International Inventories

Component	AICS	DSL/NDL	EINECS/ELI NCS	ENCS	IECSC	KECL	PICCS	TSCA
Manganese dioxide 1313-13-9 ( 15 - 40 )	X	X	X	X	X	X	X	X
Zinc 7440-66-6 ( 15 - 40 )	X	X	X	-	X	X	X	X
Zinc oxide 1314-13-2 ( 3 - 7 )	X	X	X	X	X	X	X	X
Graphite 7782-42-5 ( 1 - 5 )	X	X	X	-	X	X	X	X
Copper 7440-50-8 ( 1 - 5 )	X	X	X	-	X	X	X	X
Acrylic resin 9003-01-4 ( 0.1 - 1 )	X	X	-	X	X	X	X	X
Water 7732-18-5 ( 0.1 - 1 )	X	X	X	-	X	X	X	X
Potassium hydroxide 1310-58-3 ( 0.1 - 1 )	X	X	X	X	X	X	X	X

Polypropylene 9003-07-0 ( 0.1 - 1 )	X	X	-	X	X	X	X	X
Calcium stearate 1592-23-0 ( 0.1 - 1 )	X	X	X	X	X	X	X	X
Indium hydroxide (In(OH)3) 20661-21-6 ( 0.1 - 1 )	X	X	-	-	-	-	-	-

"-" Not Listed

"X" Listed

**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	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**

Does not apply

**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 oxide 1314-13-2	-	X	-	-
Copper 7440-50-8	-	X	X	-
Potassium hydroxide 1310-58-3	1000 lb	-	-	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	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**

This product may contain substances regulated by 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

Zinc oxide 1314-13-2	X	X	X
Potassium hydroxide 1310-58-3	X	X	X

## 16. OTHER INFORMATION

### Revision Note

Issue Date	10-Mar-2015
Revision date	10-Mar-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/NDL** - 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 -----