



Date: Jan. 3rd, 2020

### Material Safety Data Sheet for LIBA Lithium coin cell (Lithium Metal Battery)

|   |   |
|---|---|
| IDENTITY (As Used on Label and List)<br>Lithium Metal batteries | Note: Blank spaces are not permitted if any item is not applicable or no information is available, the space must be marked to indicate that. |
|---|---|

#### 1. Identification

|   |   |
|---|---|
| (a) Product name:   | <u>Primary Coin Lithium Manganese Dioxide Battery</u>                           |
| Product code:   | CR927 CR1220 CR1225 CR1620 CR1632 CR2016 CR2025 CR2032<br>CR2450                |
| (b) Other means of identification:  |   |
| Product description:  | Nominal Voltage: 3.0V   |
|   | Ampere-hour: 0.028~0.5Ah  |
| (d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party: | Manufacturer: NINGHAI HENGSHU BATTERY CO.,LTD                                   |
|   | Address: NO.158-1 Xidian South Road, Xidian Town, Ninghai County, Ningbo, China |
|   | Tel: ++86-574-65177199  |
|   | Fax: +86-574-65177885   |
| (e) Emergency phone number:   | Tel: +86-13958247688  |

#### 2. Hazard(s) identification

Classification : N/A

#### 3. Composition/information on ingredients

| Chemical Name            | Common Name and Synonyms                      | CAS#       | Content(Wt%) |
|--------------------------|---|------------|--------------|
| Lead                     | Pb  | 7439-92-1  | 0            |
| Mercury                  | Hg  | 7439-97-6  | 0            |
| Cadmium                  | Cd  | 7740-43-9  | 0            |
| Manganese Dioxide        | MnO <sub>2</sub>                              | 1313-13-9  | 25 to 40     |
| Propylene                | C <sub>4</sub> H <sub>6</sub> O <sub>3</sub>  | 108-32-7   | 2 to 6       |
| 1,2-Dimethoxyethane      | C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> | 110-71-4   | 1 to 5       |
| Lithium Perchlorate      | LiClO <sub>4</sub>                            | 7791-03-9  | 0.1 to 2     |
| Lithium or Lithium Alloy | Li  | 7439-93-2  | 1 to 4       |
| Graphite                 | C   | 7782-42-5  | 1 to 4       |
| Stainless steel          | /   | 12597-68-1 | 20 to 55     |



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|               |         |           |          |
|---------------|---------|-----------|----------|
| Polypropylene | (C3H6)n | 9003-07-0 | 0.2 to 5 |
|---------------|---------|-----------|----------|

## Lithium content for each cell

| Model  | Li content(g) | Model  | Li content(g) |
|--------|---------------|--------|---------------|
| CR927  | 0.009         | CR2016 | 0.026         |
| CR1220 | 0.012         | CR2025 | 0.046         |
| CR1225 | 0.014         | CR2032 | 0.068         |
| CR1620 | 0.022         | CR2450 | 0.173         |

#### 4. First-aid measures

(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion

Inhalation Fumes can cause respiratory irritation. Remove to fresh air and consult a physician.

Skin Contact Immediately flush skin with plenty of water. If itch or irritation by chemical burn persists, consult a physician.

Eye Contact Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately.

Ingestion If swallowing a battery, consult a physician immediately. If content come into mouth, immediately rinse by plenty of water and consult a physician.

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

N/A

(c) Indication of immediate medical attention and special treatment needed, if necessary  
Wash with clean water immediately.

#### 5. Fire-fighting measures

(a) Suitable (and unsuitable) extinguishing media.

Extinguisher of alkaline metal fire is effective. Plenty of cold water is also effective to cool the surrounding area and control the spread fire.

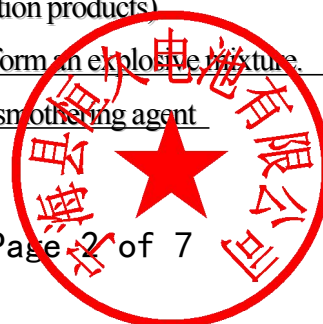
(b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products)

Hydrogen gas may be evolved by the reaction of water and lithium and it can form an explosive mixture.

Therefore when lots of lithium batteries are burning in a confined space, use a smothering agent

(ex. Carbon dioxide or dry sand).

NA=Not Applicable





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

Use self-contained breathing apparatus and full protective gear not to inhale harmful gas.

## 6. Accidental release measures

(a) Personal precautions, protective equipment, and emergency procedures.

Wear protective clothing. Keep unprotected persons away.

(b) Methods and materials for containment and cleaning up.

When the liquid leaks out of the battery, absorb and wipe it with dry cloth.

Keep the battery away from fire or heat.

## 7. Handling and storage

(a) Precautions for safe handling.

- Never swallow.

If swallowed, see Section 4-First Aid Measures.

- Never charge.

The battery is not designed to be charged by any other electrical source. Charging could generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion or fire.

- Never heat.

Heating the battery to more than 100 degree centigrade could increase the internal pressure, causing distortion, leakage, overheating, explosion or fire.

- Never expose to open flames.

Exposing to flames could cause the lithium metal to melt, causing the battery to catch on fire and explosion.

- Never disassemble the battery.

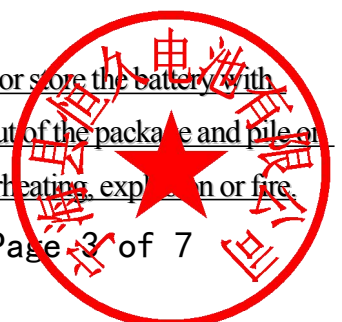
Do not disassemble the battery, because the separator or gasket could be damaged, leading to distortion, leakage, overheating, explosion or fire.

- Never reverse the positive and negative terminal when mounting.

Improper mounting of the battery could lead to short-circuiting, charging or forced-discharging. This could cause distortion, leakage, overheating, explosion, or fire.

- Never short-circuit the battery.

Do not allow the positive and negative terminals to short-circuit. Never carry or store the battery with metal objects such as a necklace or a hairpin. Do not take multiple batteries out of the package and pile or mix them when storing. Otherwise, this could lead to distortion, leakage, overheating, explosion or fire.





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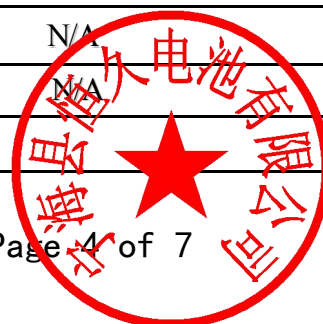
- Never weld the terminals or weld a wire to the body of the battery directly.  
The heat of welding or soldering could cause the lithium to melt, or cause damage to the insulating material in the battery. This could cause distortion, leakage, overheating, explosion or fire.
  - Never use different batteries together.  
Using different batteries together, i.e. different type or used and new or different manufacturer could cause distortion, leakage, overheating, explosion or fire because of the differences in battery property.
  - Never allow liquid leaking from the battery to get in your eyes mouth..  
If the liquid comes into eyes, or mouth, see Section 4-First Aid Measures.
  - Never leaking batteries away from fire.  
If leakage is suspected or you detect a strong odor, keep the battery away from fire, because the leaked liquid could catch on fire.
  - Never touch the battery electrodes.  
Do not allow the battery electrodes to come in contact with your skin or fingers. Otherwise, the moisture from your skin could cause a discharge of the battery, which could produce certain chemical substances causing you to receive a chemical burns.
- (b) Conditions for safe storage, including any incompatibilities.  
Never let the battery contact with water. Never store the battery in hot and high humid place.

### 8. Exposure controls/personal protection

|  |                      |      |                     |
|--|----------------------|------|---------------------|
| Occupational Exposure Limits: LTEP     |                      | STEP |                     |
| N/A                                    |                      | N/A  |                     |
| Respiratory Protection (Specify Type)  |                      | N/A  |                     |
| Ventilation                            | Local Exhausts       | N/A  | Special N/A.        |
|  | Mechanical (General) | N/A  | Other N/A.          |
| Protective Gloves                      |                      | N/A  | Eye Protection N/A. |
| Other Protective Clothing or Equipment |                      | N/A  |                     |
| Work / Hygienic Practices              |                      | N/A  |                     |

### 9. Physical and chemical properties

|                        |                      |                                       |     |
|------------------------|----------------------|---------------------------------------|-----|
| Boiling Point          | N/A                  | Specific Gravity (H <sub>2</sub> O=1) | N/A |
| Vapor Pressure (mm Hg) | N/A                  | Melting Point                         | N/A |
| Vapor Density (AIR=1)  | N/A                  | Evaporation Rate (Butyl Acetate)      | N/A |
| Solubility in Water    | N/A                  |                                       |     |
| Appearance and Odor    | Coin Shape, odorless |                                       |     |
| NA=Not Applicable      |                      |                                       |     |





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**10. Stability and reactivity**

## (a) Reactivity

N/A

## (b) Chemical stability

Stable (performance deterioration depends on circumstance.)

## (c) Possibility of hazardous reactions

No.

## (d) Conditions to avoid (e.g., static discharge, shock, or vibration )

See 7. Handling and storage

## (e) Incompatible materials

Water

## (f) Hazardous decomposition products

Hydrogen (By moisture ).**11. Toxicological information**

Description of the various toxicological(health) effects and the available data used to identify those effect, including

## (a) Information on the likely routes of exposure (inhalation, ingestion, skin, and eye contact)

As the contents are sealed in the battery case, there is no toxicity.

## (b) Symptoms related to the physical, chemical and toxicological characteristics

People might feel itching, if the inner liquid splashes onto skin.

## (c) Delayed and immediate effects and also chronic effects from short and long term exposure

N/A

## (d) Numerical measures of toxicity (such as acute toxicity estimates)

N/A

## (e) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA

No.**12. Ecological information (Non-mandatory)**(a) Ecotoxicity (aquatic and terrestrial, where available): N/A(b) Persistence and degradability: N/A

NA=Not Applicable





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- (c) Bio-accumulative potential: N/A
- (d) Mobility in soil: N/A
- (e) Other adverse effects (such as hazardous to the ozone layer): If the battery is disposed in land or water, battery case may be corroded and the liquid may leak out of the battery. Information regarding ecological concerns has not been reported.

### 13. Disposal considerations (Non-mandatory)

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

### 14. Transport information (Non-mandatory)

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

The Primary Coin Lithium Manganese Dioxide 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 Primary Coin Lithium Manganese Dioxide Battery according to Section IB of PACKING INSTRUCTION 968 and Section II of PACKING INSTRUCTION 969-970 of the 2020 IATA Dangerous Goods regulations 61<sup>th</sup> Edition may be transported and applicable U.S. DOT regulations for the safe transport of Lithium Battery.

Primary Coin Lithium Manganese Dioxide 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.

NA=Not Applicable

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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::

Lithium metal batteries (UN3090)

Lithium metal batteries packed with equipment (UN3091)

Lithium metal batteries contained in equipment (UN3091)

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

Marine pollutant (Y/N): Y;

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 Transportation's (DOT) Research and Special Programs Administration(RSPA)

### 15.Regulatory information

OSHA hazard communication standard (29 CFR 1910.1200)

\_\_\_\_\_ Hazardous

\_\_\_\_\_ √ \_\_\_\_\_ Non-hazardous

### 16. Other information

The information in this MSDS was obtained from source which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. The MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

END OF MSDS

NA=Not Applicable

