Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Product Name: Manganese Dioxide Primary Lithium Battery
Nominal Voltage: 3.0V
Battery Type:

Type	Lithium(gr.)
CR1025	0.01
CR1216	0.01
CR1220	0.01
CR1225	0.01
CR1616	0.01
CR1620	0.02
CR1625	0.02
CR1632	0.03
CR2016	0.02
CR2025	0.04
CR2032	0.05

Type	Lithium(gr.)
CR2032-SL	0.06
CR2320	0.04
CR2330	0.07
CR2354	0.13
CR2430	0.07
CR2450	0.16
CR2477	0.26
CR3032	0.15
CR2050HT	0.09
CR2450HT	0.14

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Note: the battery is neither substance nor mixture but product and having no risk to life and the health under normal use or transportation because ingredients of battery is not leaked out by virtue of hermetical sealing with metal case.

This sheet notifies possible risk of our battery under abnormal use but mainly aim to provide information about ingredients, notification of handing and transportation regulations as a useful reference.

Section 2 – Composition/Information on Ingredient

Chemical Name	CAS No.	% wt.
Manganese dioxide	1313-13-9	30
Graphite	7782-42-5	1.2
Carbon black	1333-86-4	1.2
Polytetrafluoroethylene	9002-84-0	1.0

Lithium	7439-93-2	2.6
Propylene Carbonate-solvent	108-32-7	2.3
1,2 Dimethoxyethane-solvent	110-71-4	2.1
Lithium salt	7791-3-9	2.4
Polypropylene (PP)	9003-07-0	4.2
Stainless steel	12597-68-1	53

Section 3 - Hazards Identification

The important hazards and adverse effects of the chemical product	No information available
Chemical product - specific hazards	No information available
Outline of an anticipated emergency	Chemical contents are sealed in metal can. Therefore, risk of exposure never occurs unless battery is mechanically or electrically abuse. Risk of explosion by fire is anticipated if batteries are disposed of in fire of heated above 100 degree Celsius. Stacking or jumbling of batteries may cause external short circuits, heat generation, in some case, allowing fire or explosion.

Note: Our battery is not classified in accordance with the GHS classification.

Section 4 - First Aid Measures

Eye	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Inhalation	Remove from exposure and move to fresh air immediately. Use oxygen if available.
Skin	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
Ingestion	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

Section 5 - Fire extinguishing agent

Fire extinguishing agent:

Dry chemical, alcohol resistant foam, powder, atomized water, carbon dioxide dry sand are effective.

Extinguisher method:

Escape batteries to safe place prevent from ignition by spreading fire.
Because packaging material of battery is paper, use water extinguisher, CO2 extinguisher or powder extinguisher as normal extinguisher.
Since vapor, generated from burning batteries may take eyes, nose and throat irritate, be Sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

Section 6 - Accidental Release Measures

- **Steps to be Taken in case Material is Released or Spilled**
  If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.
- **Waste Disposal Method**
  It is recommended to discharge the battery to the end, handing in the abandoned batteries to related department unified, dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental protection agency and/or federal EPA.

Section 7 - Handling and Storage

The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

- **Precautions to be taken in Handling and Storing**
  Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided.
  Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.
- **Other Precautions**
  The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures.
  Do not short or install with incorrect polarity.

Section 8 - Exposure Controls, Personal Protection

- **Respiratory Protection**
  In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

- **Ventilation**
  Not necessary under conditions of normal use.
- **Protective Gloves**
  Not necessary under conditions of normal use.
- **Other Protective Clothing or Equipment**
  Not necessary under conditions of normal use.
  Personal Protection is recommended for venting battery: Respiratory protection,

  Protective gloves, protective clothing and safety glass with side shields.

Section 9 - Physical and Chemical Properties

State : Solid
Shape : Coin-type

Section 10 - Stability and Reactivity

- **Stability**
  Stable
- **Conditions to Avoid**
  Heating, mechanical abuse and electrical abuse.
- **Hazardous Decomposition Products**
  N/A.
- **Hazardous Polymerization**
  N/A.
  If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons.

Section 11 - Toxicological Information

Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Section 12 - Ecological Information

When promptly used or disposed the battery does not present environmental hazard. When disposed, keep away from water, rain and snow.

Section 13 - Disposal Considerations

- **APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION**
  If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amount of not reaction or unconsumed lithium remaining in the spent battery. The battery must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste. Recycling of battery can be done in authorized facility, through licensed waste carrier.

Section 14 - Transport Information

For the international transport of lithium batteries, they must comply with these regulations: the International Maritime Dangerous Goods (IMDG) Code by International Maritime Organization (IMO), Dangerous Goods Regulations (DGR) by International Air Transport Association (IATA) and Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI) by International Civil Aviation Organization (ICAO). These

regulations are based on the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.
Lithium batteries which meet the requirements of UN38.3 (UN Manual of Tests and Criteria, Part Ⅲ, subsection 38.3) could be transported by air and by sea as ordinary goods, otherwise should be transported according to Class 9, Packing Group Ⅱ hazardous goods. As the published of the UN Recommendations on the Transport of Dangerous Goods, all these regulations have added some new contents to regulate the transport of lithium metal batteries. And they should be complied since January 1, 2009. Following the latest changes on Lithium Cells / Batteries shipment as per the 59th edition of IATA Dangerous Goods Regulations, the Lithium Battery Best Practice 018will replace Best Practice 017 and with effect from January 1, 2018.

1. For lithium metal batteries, UN ID number is 3090. For lithium metal batteries contained in equipment or lithium metal batteries packed with equipment, UN ID number is 3091.
2. The consignment should be fully described by proper shipping name and packed, marked and in proper condition for carriage by air. The consignment is not classified as dangerous under the current edition of the IATA 59th Effective, Dangerous goods regulation and all applicable carrier and government regulations.
3. For transported air, Lithium-metal Cells/Batteries shipped as "Not Restricted" Cargo, Must comply with Section Ⅰ B of PI 968 accordingly. For cells, the lithium net content should not be more than 1g; for batteries, the lithium net content should not be more than 2g. Each package must be labeled with a lithium battery handling label in addition to the Class 9 hazard label and the Cargo Aircraft Only label (marked by manufacturer).
4. Each consignment must be accompanied with a document such as an air waybill with an indication. For those Lithium metal cells/batteries contained in equipment, the equipment must be equipped with an effective means of preventing accidental activation.
5. The net quantity of lithium –metal battery（cells），shall not exceed 2.5kg if transport as PI 968,and need to paste the Li-metal battery marking; The net quantity of lithium-metal battery (cells) shall not exceed 5kg if transport as PI 969 or PI 970; and need to paste the Li-metal battery marking.
6. Each package must be capable of withstanding a 1.2m drop test in orientation without damage of cells or batteries contained therein.
7. Lithium batteries which meet the requirements of which could be transported by air, and the batteries manufactured by EVE Energy Co., Ltd meet these requirements.

(Lithium batteries identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden transport.)

8. Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packing that could lead to short circuit.
9. Lithium –metal battery is applicable to the International Maritime Dangerous Goods

   Code (IMDG-Code) Special provision 188 because it corresponds to either case that the cell – lithium content is less than 1g or the battery – lithium content is less than 2g, so it is permitted to transport as Exempted Dangerous Goods when it complies with all requirements of the transport conditions.

Transport Fashion: by air, by sea.
Packaging Information: packaging paper + plastic tray.

Section 15 - Regulatory Information

- **Law Information**

  《Dangerous Goods Regulation》
  《Recommendations on the Transport of Dangerous Goods Model Regulations》
  《International Maritime Dangerous Goods》
  《Technical Instructions for the Safe Transport of Dangerous Goods》
  《Classification and code of dangerous goods》
  《Occupational Safety and Health Act》(OSHA)
  《Toxic Substances Control Act》(TSCA)
  《Consumer Product Safety Act》(CPSA)
  《Federal Environmental Pollution Control Act》(FEPCA)
  《The Oil Pollution Act》(OPA)
  《Superfund Amendments and Reauthorization Act Title III (302/311/312/313)》(SARA)
  《Resource Conservation and Recovery Act》(RCRA)
  《Safety Drinking Water Act》(CWA)
  《California Proposition 65》
  《Code of Federal Regulations》(CFR)
  In accordance with all federal, state and local laws.

Section 16 - Additional Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.