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Product: GWH8
Part Number: 6000714



Date: Jan. 08, 2021
Ref. No: MLK-CR-210108

MATERIAL SAFETY DATA SHEET(MSDS)

1. Chemical product and company Identification

Applicant : SHENZHEN M&LAK INDUSTRY CO., LTD.
Address : 5/F., Jinshan Ind. park, Guangshen Road, No.375, Xixiang,
Baoan district, Shenzhen, China.
Sample name : 3.0V Lithium Metal Battery
Model : CR632、CR927、CR1025、CR1130、CR1212、CR1216、CR1220、CR1225、
CR1612、CR1616、CR1620、CR1625、CR1632、CR1654、CR2016、
CR2020、CR2025、CR2032、CR2050、CR2320、CR2325、CR2330、
CR2335、CR2354、CR2412、CR2430、CR2450、CR2477、CR2477T、
CR3032
Telepone number : +86-755-2786 3350
Fax number : +86-755-2786 3351
Emergency telephone : +86-755-2786 3350
Email : sales@malak.cn

2. Hazards Identification

GHS Classification : Not applicable
Toxicity : Vapor generated from burning batteries, may irritate eyes, skin and throat.
Hazard : Electrolyte and lithium metal are inflammable.
Risk of explosion by fire if batteries are disposed in fire or heated above 100
degrees C.
Stacking or jumbling batteries may cause external short circuits, heat
generation, fire or explosion.

3. Composition/Information of Ingredients

| Component | Material | CAS No. | EC No. | Content (%) |
|--------------------------|---------------------|------------|-----------|-------------|
| Positive electrode | Manganese dioxide | 1313-13-9 | 215-202-6 | 12~50 |
| Negative electrode | Lithium metal | 7439-93-2 | 231-102-5 | 0.5~6 |
| Electrolyte | 1,2-dimethoxyethane | 110-71-4 | 203-794-9 | 1.5~3.5 |
| | Lithium Perchlorate | 7791-03-9 | 232-237-2 | 0.2~0.7 |
| | Propylene Carbonate | 108-32-7 | 203-572-1 | 2.5~7 |
| Others | Stainless Steel | 12597-68-1 | | 30~85 |
| (Steel or Plastic parts) | Polypropylene | 9003-07-0 | | 0.5~10 |

Lithium content per cell

| Model Number | Lithium content(g) | Model Number | Lithium content(g) | Model Number | Lithium content(g) | Model Number | Lithium content(g) |
|--------------|--------------------|--------------|--------------------|--------------|--------------------|--------------|--------------------|
| CR632 | 0.008 | CR1612 | 0.01 | CR2025 | 0.05 | CR2412 | 0.03 |
| CR927 | 0.009 | CR1616 | 0.015 | CR2032 | 0.062 | CR2430 | 0.09 |
| CR1025 | 0.009 | CR1620 | 0.02 | CR2050 | 0.11 | CR2450 | 0.18 |
| CR1130 | 0.009 | CR1625 | 0.023 | CR2320 | 0.05 | CR2477 | 0.29 |
| CR1212 | 0.009 | CR1632 | 0.036 | CR2325 | 0.06 | CR2477T | 0.29 |
| CR1216 | 0.008 | CR1654 | 0.06 | CR2330 | 0.08 | CR3032 | 0.17 |
| CR1220 | 0.01 | CR2016 | 0.02 | CR2335 | 0.09 | | |
| CR1225 | 0.015 | CR2020 | 0.035 | CR2354 | 0.17 | | |

4. First Aid Measures (in case of electrolyte leakage from the battery)

- Eye contact : Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Get immediate medical treatment. If appropriate procedures are not taken, this may cause eye injury.
- Skin contact : Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
- Inhalation : Remove to fresh air immediately. Get medical treatment immediately.

5. Fire Fighting Measures

- Extinguishing method : Since vapor, generated from burning batteries may make eyes, nose and throat irritates, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.
- Fire extinguishing agent : Alcohol-resistant foam and dry sand are effective.

6. Accidental Release Measures (in case of electrolyte leakage from the battery)

- Take up with absorbent cloth, treat cloth as inflammable.
- Move the battery away from the fire.

7. Handling and Storage

Handling:

- When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing partitions in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not short-circuit, recharge, deform, throw into fire or disassemble.

- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Insert the battery correctly in electrical equipment.

Storage:

- Do not let water penetrate into packaging boxes during their storage and transportation.
- Do not store the battery in places of the high temperature or under direct sunlight
- Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, rain or frozen condition.

8. Exposure Controls and Personal Protection

Acceptable concentration : Not specified about Lithium Battery.

Facilities : Nothing in particular.

Protective Equipment (in case of electrolyte leakage from the battery)

Respiratory Protection : Self-Contained Breathing Apparatus for organic gases.

Hand Protection : Safety glove.

Respiratory Protection : Safety goggle.

9. Physical and Chemical Properties

Appearance : Coin shape

Voltage : 3 V

10. Stability and Reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.

As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. Toxicological Information (in case of electrolyte leakage from the battery)

Acute toxicity : Oral (rat) LD50 > 2,000mg/kg (estimated)

Irritation : Irritating to eye and skin.

Mutagenicity : Not specified.

Chronic toxicity : Not specified.

12. Ecological Information

In case of the worn-out battery was disposed in land, the battery case may be corroded, and leak electrolyte.

However, there is no environmental impact information.

Mercury (Hg), Cadmium (Cd) and Lead (Pb) are not used in cell.

13. Disposal Considerations

When the battery is worn out, dispose of it under the ordinance of each local government.

14. Transport Information

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.

During the transportation do not allow packages to be fallen down or damaged.

Proper shipping Name : Lithium metal batteries.

UN Number, UN Class : UN3090, Class 9 (for the Air transport by PI968 Section IA or IB)
: Exemption (for the Marine transport and the Air transport by Section II of PI968, 969 or 970).

Even though the cells are classified as lithium metal batteries (UN3090 or UN3091), they are not subject to some requirements of Dangerous Goods Regulations because they meet the following:

1. For cells, the lithium content is not more than 0.3g;
2. Each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3.
3. Each cell is manufactured in ISO9001 certified factory.

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Please refer to the following reference information about concrete ways of transportation. Actual content of packaging label and shipping documents varies by shipping companies. Make sure to confirm in advance with your shipping company.

Information of reference

| | Reference | Packing Instruction (PI) Special provision | Note |
|------------------|-----------|---|--|
| Air transport | IATA DGR | PI 968 Section I A | Cells, Cargo Aircraft only; Net quantity per package Max. 35kg |
| | | PI 968 Section I B | Cells, Cargo Aircraft only; Net quantity per package Max. 2.5kg |
| | | PI 968 Section II | Cells, Cargo Aircraft only; not more than one package in any single consignment; Net quantity per package Max. 2.5kg |
| | | PI 969 Section II | Cells packed with equipment |
| | | PI 970 Section II | Cells contained in equipment |
| Marine transport | IMDG Code | SP188 | |

Note. This does not apply to lithium metal batteries packed with equipment (PI969) or contained in equipment (PI 970)

| Lithium Content Per Cell | Product Name | Air *See Section 15 | | | Marine *See Section 15 |
|--|----------------------------------|--|-------------------------------|--------------------------------|------------------------------|
| | | Cell only | Cell packed with equipment | Cell contained in equipment | |
| Not more than 0.3 g | All Lithium Metal Button Cell | PI968 Section II | PI969 Section II | PI970 Section II | SP188 |
| More than 0.3 g but not more than 1 g | (No) | PI968 Section IB (8 or less cells : Section II) | PI969 Section II | PI970 Section II | SP188 |
| More than 1 g | (No) | PI968 Section IA | PI969 Section I | PI970 Section I | SP230 |

15. Regulatory Information

- IATA Dangerous Goods Regulations 62nd Edition (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2020 Edition (IMDG Code)
- UN Recommendations on Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on Transportation of Dangerous Goods, Manual of Tests and Criteria
- EU Battery Directive (2006/66/EC, 2013/56/EU)
- Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- Act on Preventing Environmental Pollution of Mercury (China)

16. Other Information

This MSDS is provided to customers as reference information in order to handle batteries safely.

It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling, based on this information.

Prepared by : Engineering Department
Shenzhen M&LAK Industry Co., Ltd.



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