PRODUCT SAFETY DATA SHEET

1. Product and Company identification

Product Category: Lithium Manganese Battery Coin Type
Type: CR2016, CR2025, CR2032, CR2430, CR2450, CR2477
Nominal Voltage: 3.0 V

Supplier's Name: FDK CORPORATION
Supplier's Address: 5-36-11, Shimbashi, Minato-Ku, Tokyo, 105-8677, Japan
Telephone +81-3-3434-1279

Manufacturer's Name: FDK ENERGY CO., LTD.
Manufacturer's Address: 614, Washizu, Kosai-Shi, Shizuoka, 431-0431, Japan
Telephone +81-53-576-2111

2. Composition and Ingredients information

| Material                  | CAS No.     | PRTR | Contents
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide [MnO₂]</td>
<td>1313-13-9</td>
<td>・・311</td>
<td>13・・50 wt%</td>
</tr>
<tr>
<td>Lithium [Li]¹¹</td>
<td>7439-93-2</td>
<td></td>
<td>0.5・・4 wt% (0.02・・0.3 g)</td>
</tr>
<tr>
<td>Electrolyte [Organic EL]</td>
<td>-</td>
<td></td>
<td>3・・12 wt%</td>
</tr>
<tr>
<td>Lithium perchlorate [LiClO₄]</td>
<td>7791-03-9</td>
<td></td>
<td>0.3・・1 wt%</td>
</tr>
</tbody>
</table>

Note) Above ingredients are not leaked out without disassembled or broken intentionally because it is protected by sealing with metal case.

3. Summary of hazard

Fatal hazard:
Electrolyte and lithium metal are inflammable. (When lithium metal contacts with water, highly flammable gases are liberated.)
Risk of explosion by fire if batteries are disposed in fire or heated above 100 degree Celsius. Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.

Health hazard:
Chemical contents are contained in sealed can. Therefore, risk of exposure occurs if the battery is mechanically or electrically abused. The most likely risk is irritating when a batteries were burnt and generated vapor may attack the eye, skin and throat.

Influence on environment:
No information available.

4. First aid

Inhalation:
Provide fresh air. Refer for medical attention.

Skin contact:
Wash the contact areas off immediately with plenty of water and soap. If appropriate procedure are not taken, this may cause sores on the skin.
5. Fire fighting

Extinguishing method: Since vapor, generated from burning batteries may make eyes, nose and throat irritates, be sure to extinguish the fire on the wind word side. Wear the respiratory protection equipment in some cases. The Lithium metal in batteries reacts with water and generates Hydrogen gas. Risk of explosion by fire fighting using water.

Fire extinguishing agent: Dry chemical, alcohol-resistant foam, carbon dioxide and dry sand are effective.

6. Spillage disposal

Chemical contents are contained in sealed can. But if the battery is mechanically or electrically abused, the contents may leak out. In this case, wipe with a dry cloth. Take away from the fire.

7. Precautions for handling and storing

| Handling:                                      | When packing the batteries, do not allow battery terminals to contact each other, or contact with other terminals. Be sure to pack batteries by providing partitions in the packing box, or in a separate plastic bag so that the single batteries are not mixed together.
|                                               | (1) Use non-breakable packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
|                                               | (2) Do not recharge batteries. Do not deform batteries.
|                                               | (3) Do not mix different type of batteries.
|                                               | (4) Do not solder directly onto batteries.
| Storage:                                       | Batteries shall be stored in well-ventilated, dry and cool conditions.
|                                               | (1) Do not let water penetrate into packaging boxes during their storage and transportation.
|                                               | (2) Do not store the batteries in palaces of the high temperature exceeding 35 degree Celsius or under direct sunlight or in front of a stove. Please also avoid the place of high humidity. Be sure not to expose the batteries to condensation, water drop or not to store it under frozen condition.
|                                               | (3) Fire fighting apparatus should be installed.

8. Prevention from exposure

Acceptable concentration: Not specified in ACGIH.
Facilities: Provide appropriate ventilation system such as local ventilator in the storage place.
Protective clothing: Gas mask for organic gases, safety goggle, and safety glove.
9. Physical and chemical characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td>Coin shape</td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>3V</td>
</tr>
<tr>
<td>pH</td>
<td>NA</td>
</tr>
<tr>
<td>Boiling point</td>
<td>NA</td>
</tr>
<tr>
<td>Melting point</td>
<td>180.5°C (Metal Lithium)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>NA</td>
</tr>
<tr>
<td>Flash point</td>
<td>3.5°C (Organic electrolyte) / 179°C (Metal Lithium)</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>NA</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>NA</td>
</tr>
<tr>
<td>Solubility</td>
<td>NA</td>
</tr>
</tbody>
</table>

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. Toxicity information (in case of electrolyte leakage from the battery)

- Acute toxicity: Oral (rat) LD50 > 2,000mg/kg (estimated)
- Acridity: Irritating to eye and skin.
- Mutagenicity: Not specified.
- Chronic toxicity: Liver or Kidney problem may occur in case of prolonged exposure.

12. Ecological information

When the batteries was disposed of and buried under field, the leakage may happen by corrosion as times go. It is not informed, however, that such improper handling caused to affect environment through the long term of underground experiment.

- Mercury: below 0.5 ppm
- Cadmium: below 4 ppm
- Lead: below 40 ppm

13. Disposal precautions

Dispose in accordance with applicable federal, state and local regulations.
14. Transportation precautions

- Depend on the UN Recommendations on the Transport of Dangerous Goods (hereinafter referred to as the "UN Recommendations"), Lithium metal battery shall comply with these recommendations. On the other hand, certain regulations of transportation laid down by organization of each transportation and each own country’s regulation for transportation are occasionally different from UN Recommendations, however Lithium metal battery shall comply with these regulations too. Furthermore, such batteries as contained in or packed with equipment shall also comply with UN Recommendations and regulations.

- Lithium metal battery is classified in two types; Dangerous goods (Class 9) and No dangerous goods (exemption from regulation) depend on content of Lithium or Lithium alloy, and each treatment is different. Such battery containing Lithium or Lithium alloy is less than 1 g (Battery pack: 2 g) is regarded as No dangerous battery, therefore this battery is classified to No dangerous goods and Special provision 188 is applied.

Classification of UN Recommendations

<table>
<thead>
<tr>
<th>UN· ID No.</th>
<th>Proper Sipping Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3090</td>
<td>Lithium metal batteries</td>
<td></td>
</tr>
<tr>
<td>3091</td>
<td>Lithium metal batteries contained in equipment</td>
<td></td>
</tr>
<tr>
<td>3091</td>
<td>Lithium metal batteries packed with equipment</td>
<td></td>
</tr>
</tbody>
</table>

Other major related regulations

<table>
<thead>
<tr>
<th>Transportations</th>
<th>Related organization / Issue documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air transport (by airplane)</td>
<td>ICAO• International Civil Aviation Organization• • •Í×• Technical Instruction•• • IATA• International Air Transport Association• • •DGR• Dangerous Goods Regulations• •</td>
</tr>
<tr>
<td>Maritime transport (by ship)</td>
<td>IMO• International Maritime Organization•• •IMDG Code International Maritime Dangerous Goods Code•</td>
</tr>
<tr>
<td>Regulation of USDOT</td>
<td>USDOT• US Department of Transportation• • •DOT49CFR• US law•</td>
</tr>
<tr>
<td>Land transport (Intra-European)</td>
<td>RID• International Carriage of Dangerous Goods by Rail• • •ADR• International Carriage of Dangerous Goods by Road•</td>
</tr>
</tbody>
</table>

15. Applicable regulations

Outline of applicable regulations are as following.

1) Common regulation with both Maritime and Air Transport

With the exception of packages containing four or fewer unit cells or two or fewer assembled batteries built into equipment, marking and documentation are required.

With the exception of batteries built into equipment, 1.2-m drop testing is now required.

Marking and documentation require the indication of an emergency contact, i.e., a "telephone number for additional information."

2) Regulation only with Air Transport

Per-package maximum weight of Passenger aircraft and Cargo aircraft is as follows.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Passage aircraft</th>
<th>Cargo aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batteries (transport of batteries only; maximum total weight per package)</td>
<td>2.5Kg G° Package Max.</td>
<td>Same as Passage aircraft</td>
</tr>
<tr>
<td>Batteries packed with equipment (maximum total weight per package of battery excluding equipment)</td>
<td>No weight restrictions; however, the maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares;</td>
<td>Robust packaging as currently practiced</td>
</tr>
<tr>
<td>Batteries contained in equipment (maximum net weight of battery per equipment)</td>
<td>No weight restrictions</td>
<td></td>
</tr>
</tbody>
</table>

FDK ENERGY CO., LTD.
3) Packing instruction
   IATA packing instructions are applicable in accordance with each type of packaging.
   Lithium metal batteries (only): PI968
   Lithium metal batteries in equipment: PI969
   Lithium metal batteries packed with equipment: PI970

4) IATA Special provision
   With in each case, IATA special provisions; A88, A99, A154, A164 are applicable.

16. Other information

   Reference ;
   (1) UN Recommendations on the Transportation of Dangerous Goods Model Regulations
       (ST/SG/AC.10/1/Rev.12)
   (2) Federal Register / Vol.65, No.174 / Thursday, September 7, 2000 / Notices
   (3) IATA Dangerous Goods Regulations, latest edition
**Note:** Component weight is based on assembly of generic parts.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Material Mass %</th>
<th>CAS Number</th>
<th>Material Name</th>
<th>Compound</th>
<th>Material Analysis (Element)</th>
<th>Weight (g)</th>
<th>Component Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.54</td>
<td>0.2</td>
<td>7490-02-0</td>
<td>0.01</td>
<td>SUS</td>
<td>Nickel</td>
<td>0.98</td>
<td>1.11</td>
<td>Positive case</td>
</tr>
<tr>
<td>1.7</td>
<td>0.62</td>
<td>9003-07-0</td>
<td>0.01</td>
<td>PP</td>
<td>Gasket</td>
<td>0.11</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>0.9</td>
<td>2.49</td>
<td>1313-13-9</td>
<td>0.01</td>
<td>EP</td>
<td>Cellplate</td>
<td>0.11</td>
<td>3.11</td>
<td>4</td>
</tr>
<tr>
<td>0.3</td>
<td>0.02</td>
<td>14939-93-2</td>
<td>0.01</td>
<td>Li</td>
<td>Lithium</td>
<td>0.21</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>0.4</td>
<td>0.08</td>
<td>7490-02-0</td>
<td>0.01</td>
<td>SUS</td>
<td>Nickel</td>
<td>0.96</td>
<td>1.2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Material Declaration Sheet**

Date: March 2, 2009

FDK ENERGY CO., LTD.

**Total Weight:** 6.9 g

**Type:** CR2450