SDS is not applicable to the product hermetically sealed as dry battery. The battery has no risk to life and health under normal use or transportation because ingredients of battery are not leaked out by virtue of hermetical sealing with metal case. This SDS notify possible risk of our battery under abnormal use but mainly aim to provide information about ingredients, notification of handling and transportation regulations as a useful reference.

Note) Our battery is not classified in accordance with the GHS classification.
4. First-aid measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>If ingredient leaked out from inside of a battery and if inhaled it, move to a place where fresh air is provided. Refer for medical attention.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>If ingredient leaked out from inside of a battery and stuck on skin, 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. Refer for medical attention.</td>
</tr>
<tr>
<td>Eyes contact</td>
<td>If ingredient leaked out from inside of a battery and came into eyes, flush the eyes with plenty of water for at least 15 minutes immediately without rubbing. Take a medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.</td>
</tr>
<tr>
<td>Swallowing</td>
<td>In case of swallowing of battery, immediately refer for medical attention.</td>
</tr>
</tbody>
</table>

5. Fire-fighting measures

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

Extinguishing 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 make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

6. Accidental release measures

Chemical contents are sealed in metal can. But if the battery is mechanically or electrically abused, contents may leak out. In such case, take action as showing below.

Personal precautions: Temporary inhalation of odor and attaching of electrolyte to skin does not cause serious health hazard. Be sure the ventilation and washing out of electrolyte quickly.

Environmental precautions: Clean up it quickly. Specific environmental precaution is not necessary.

Method and materials for containment and methods and materials for cleaning up:
- Contain and collect spillage and place in container for disposal according to local regulations.

7. Handling and storing

Handling
- Do not charge, short-circuit, disassemble, deform, heat above 100℃ or incinerate.
- Do not pile up or mingle batteries with each other.
- Do not place battery on metal case, metal plate or antistatic material.
- In case of multi cell application, replace all batteries to new at once when replacing used batteries.

Storage
- Be sure to store batteries in well-ventilated, dry and cool conditions.
- Keep away from water, rain, snow, frost or dew condensation.
- Do not store batteries near source of heat or nozzle of hot air.
- Do not store batteries in direct sunshine.
- Take care not to get wet packing by dew condensation when packing is removed from cold to warm and humid condition.
- Enough number of fire fighting apparatuses should be installed in warehouse.

8. Exposure controls and personal protection

There is no need of personal protective equipment on regular handling and storage. In the event, however, a large amount of electrolyte should be released by mechanical or electrical abuse, use the protections as shown below.

- Respiratory protection: Mask (with a filter preferably)
- Hand protection: Synthetic rubber gloves
- Eye protection: Goggles or glasses
9. Physical and chemical properties
   State: Solid
   Shape: Cylindrical

10. Stability and reactivity
    Stability: Stable on regular handling
    Conditions to avoid: External short circuit of battery, deformation by crush, exposure at high temperature of more than 100 degree C (may cause heat generation and ignition), direct sunlight, high humidity
    Materials to avoid: Substances that cause short circuit.

11. Toxicological information
    Since chemicals are contained in a sealed can, there are no hazards.
    Toxicological information of main components of battery is shown below as reference.
    Manganese Dioxide
       Acute toxicity: rabbit: LDL_0 (blue pipe) = 45mg/kg, mouse: LD_50(subcutaneous) = 422mg/kg
       Local effects: Stimulus to an eye, a nose, a throat, and a skin
       Chronic toxicity or long-term toxicity: Inhalation of powder dust or fume for a long time (at least 3 months) may cause specific central nerve symptom like Parkinson’s disease.
    Lithium metal
       Acute toxicity: No information in a metal state
       Local effects: Touching on a skin or an eye causes thermal burn and alkaline chemical burn.
    Lithium perchlorate
       Acute toxicity: No information at present
       Local effects: Slight stimulus to an eye and skin
    1,2-Dimethoxyethane
       Acute toxicity: mouse: LD_50(subcutaneous) = 2.5mg/kg
       Local effects: Slight stimulus to skin
    Mixture of organic solvent
       Acute toxicity: No information at present
       Local effects: Slight stimulus to an eye

12. Ecological information
    Persistence and degradability: No information available
    Mobility in soil: No information available

13. Disposal considerations
    Dispose of batteries in accordance with applicable federal, state and local regulations.
    For safety precaution, battery should be insulated in proper manner; covering both terminals by tape, wrapping of battery in insulative bag or packing battery in original package is recommended in order to prevent ignition or explosion due to short-circuit.

14. Transportation Information
    Lithium metal cells and batteries are classified as Class 9 Dangerous Goods in the United Nations Recommendation, and given UN numbers as shown in the below table. In case of transport of lithium metal cells and batteries, compliance with all the relevant UN regulations in addition to the requirements of United Nations Recommendation is required.
    Our battery (listed on section 1) and its shipping package complies with the requirement of UN Manual of Test and Criteria, Part III, subsection 38.3 as well as the requirements described below, so it is permitted to transport.
<Air Transport>

Our battery is applicable to IATA Dangerous Goods Regulations (IATA-DGR) Packing Instruction 968 section IB because it corresponds to either case that the cell – lithium content is more than 0.3g and less than 1g or the battery – lithium content is more than 0.3g and less than 2g. Our battery and its shipping package is permitted to transport as Class 9 Dangerous Goods but without using packing group II package when it complies with all requirements of the transport conditions for Section IB.

Lithium metal batteries transported as cargo will be restricted to cargo aircraft only from 1 January 2015. Our products can be transported by cargo aircraft only since our products are classified into lithium metal batteries. Such lithium metal batteries contained in or packed with equipment are exempted.

<Sea Transport>

Our 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.

<table>
<thead>
<tr>
<th>UN No.</th>
<th>Packing Instruction</th>
<th>Proper Shipping Name/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3090</td>
<td>968</td>
<td>Lithium metal batteries</td>
</tr>
<tr>
<td>3091</td>
<td>969</td>
<td>Lithium metal batteries packed with equipment</td>
</tr>
<tr>
<td>3091</td>
<td>970</td>
<td>Lithium metal batteries contained in equipment</td>
</tr>
</tbody>
</table>

Related regulations: Following regulations shall be cited and considered.

<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) / TI (Technical Instruction)</td>
</tr>
<tr>
<td></td>
<td>IATA (International Air Transport Association) / DGR (Dangerous Goods Regulations) *1</td>
</tr>
<tr>
<td>Maritime transport (by ship)</td>
<td>IMO (International Maritime Organization) / IMDG Code (International Maritime Dangerous Goods Code) *2</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>
<tr>
<td>USA / UN</td>
<td>USDOT (US Department of Transportation) / DOT 49 CFR (US law)</td>
</tr>
</tbody>
</table>

15. Applicable legislation
   EU Directive 2006/66/EC
   CA Lithium Perchlorate Regulation

16. Other information
   Reference
   • IATA Dangerous Goods Regulations, latest edition *1

   Notes on this sheet
   *1 Dangerous Goods Regulations – 56th Edition Effective 1 January 2015: International Air Transport Association (IATA)

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