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PRODUCT SAFETY DATA SHEET

Manufacturer

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Name of Product Lithium metal battery (or, Lithium alloy battery)

(Applied Model Name) ＊ Please see attached sheet (Last Page)

Substance Identification

Substance : Lithium metal battery

CAS number : Not specified

UN Class : Even classified as lithium metal batteries (UN3090), 2009 IATA Dangerous Goods Regulations 50th edition Packing Instruction 968□Part 1 is applied. The product is handled as Non-Dangerous Goods by meeting the following requirements. (1)

Lithium metal cells and batteries offered for transport are not subjec to other additional requirements of the UN Regulations if they meet the following: (1)(3)

1. for cells, content of lithium less than 1g per cell ;
2. for batteries, content of lithium less than 2g per cell .
   The Watt-hour rating must be marked on outside of the battery case except those manufactured before 1 January 2009 which may be transported without this marking until 31 December 2010.
3. each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria Part Ⅲ subsection 38.3.

And they are out of scope for Special Provision A154 and comply with Special Provision A164. (3)

Composition: Positive electrode;		
	Cell Type A; Lithium Thionyl Chloride	20 －35wt%
	Cell Type B; Lithiium Managanese Dioxide	20－35wt%
	Lithium	10－20wt%
Electrolyte; Organic electrolyte mainly composed of alkyl carbonate		10－20wt%
Enclosure; Plastic		

Hazardous and Toxicity Class

Class name	: Not applicable for regulated class
Hazard	: It may cause heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.
Toxicity	: Vapor generated from burning batteries, may make eyes, skin and throat irritate.

First Aid Measures

The product contains organic electrolyte. In case of electrolyte leakage from the battery, actions described below are required.

Eye contact	: Flush the eyes with plenty of clean 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.
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. Take a medical treatment.

Fire Fighting Measures

Extinguishing method	: 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.
Fire extinguishing agent	: Plenty of water and alcohol-resistant foam are effective.

Measures for electrolyte leakage from the battery

- Take up with absorbent cloth.
- Move the battery away from the fire.

Handling and Storage

- 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. (1)(2)

- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation. (1)(2)(3)
- Do not let water penetrate into packaging boxes during their storage and transportation.
- The batteries will be stored at room temperature, charged to about 30－50% of capacity.
- Do not store the battery in places of the high temperature exceeding 35 deg. C or under direct sunlight or in front of a stove. Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, water drop or not to store it under frozen condition.
- Batteries are sure to be packed in such a way as to prevent short circuits under conditions normally encountered in transport. (1)(2)(3)
- Please avoid storing the battery in the places where it is exposed to the static electricity so that no damage will not be caused to the protection circuit of the battery pack.

Exposure Control (in case of electrolyte leakage from the battery)

Acceptable concentration	: Not specified in ACGIH. (4)
Facilities	: Provide appropriate ventilation system such as local ventilator in the storage place.
Protective clothing	: Gas mask for organic gases, safety goggle, safety glove.

Physical and Chemical Properties of Single cell

Appearance	: Single cell: Prismatic cell
Nominal voltage	: Single cell: Please see attached sheet (Last Page)

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 charge, 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.

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

Acute toxicity	: Oral (rat) LD50 >2g/kg (estimated)
Irritation	: Irritating to eyes and skin.
Mutagenicity	: Not specified.
Chronic toxicity	: Not specified.

Ecological Information

- In case of the worn-out battery was disposed in land, the battery case may be corroded, and leak electrolyte. But, we have no ecological information.

Heavy metal in battery : Mercury(Hg) and Cadmium(Cd) are neither contained nor used in battery.

Disposal Considerations (Precautions for recycling)

- When the battery is worn out, dispose of it under the ordinance of each local government or the low issued by relating government.
- Disposal of the worn-out battery may be subjected to Collection and Recycling Regulation.

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.
- Lithium ion batteries identified by 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 for transport (e.g. those being returned to the manufacturer for safety reasons).
- Except when installed in equipment, for air shipment that contain one or more cells or batteries, they are necessary to meet the following items.
  1. Each consignment must be accompanied with a document such as air waybill with an indication that:
     - the package contains lithium ion cells or batteries;
     - the package must be handled with care and that a flammability hazard exists if the package is damaged;
     - special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
     - a telephone number for additional information.
  2. Each package must be labeled with a lithium battery handling label.
     * The width 120mm * length 110mm sized lithium battery handling label must be labeled onto the side of a package without bending it.
  3. Each package must be capable of withstanding a 1.2 m drop test in any orientation.
     - damage to cells or batteries contained therein;
     - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
     - releaser of contents.
  4. Quantity per package shall not exceed 2.5kg.
  5. Each package containing more than four cells or more than two batteries installed in equipment must be complied with above item 1 and 2.
- Recommendations on the transport of dangerous goods-Model Regulations 15th revised edition, IATA Special Provision A154, A164 and IMDG Special Provision 188.

Regulatory Information

- IATA Dangerous Goods Regulations 50th Edition Effective 1 January 2009.
- ICAO Technical Instructions for the safe transport of dangerous goods by air.

Others

References

(1) UN Recommendations on the Transportation of Dangerous Goods Model Regulations. (ST/SG/AC.10/1/Rev.15)

(2) Federal Resister/ Vol. 65, No. 174/Thursday, September7, 2000/Notices.

(3) IATA Dangerous Goods Regulations 50th Edition Effective 1 January 2009.

(4) TLVs and BEIs 1999 ACGIH

Model Name	Cell		Battery pack	
EVE	Nominal Voltage(V)	Rating Voltage(V)	Rating Capacity(mAh)	Content Li Rating(g)
ER14250	3.6	3.6	1200	0.33
ER14335	3.6	3.6	1650	0.45
ER14505	3.6	3.6	2400	0.65
ER17335	3.6	3.6	2100	0.57
ER17505	3.6	3.6	3600	0.97
ER17505M	3.6	3.6	3000	0.80
ER26500	3.6	3.6	7000	1.90
ER22G68	3.6	3.6	400	0.11
ER32L65	3.6	3.6	1000	0.27
ER32L100	3.6	3.6	1700	0.46
CR2032	3.0	3.0	220	0.06
CR2430	3.0	3.0	280	0.08
CR2450	3.0	3.0	600	0.16
CR2477	3.0	3.0	950	0.26
CR17450	3.0	3.0	2000	0.52
CR123A	3.0	3.0	1500	0.41
CR9V/P	3.0	3.0	1200	0.93