

## PRODUCT SAFETY DATA SHEET

### 1 Name of Product and Manufacturer

Name of Product : Vanadium pent-oxide lithium rechargeable battery  
Model name : See table

Name of Company : Panasonic Corporation Energy Company  
Address : 1-1 Matsushita-cho, Moriguchi City, Osaka, 570-8511, Japan  
Division : Energy Solution Business Unit  
Department : Product Engineering Group  
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### 2 Substance Identification

Substance : Lithium battery  
(Lithium metal battery, Rechargeable lithium battery)

CAS number : Not specified.

UN Class : Even though the cells or batteries are classified as lithium metal batteries (UN3090/UN3091), they are exempted from Dangerous Goods because they meet the following: <References (1)(3)>  
1. for cells, the lithium content is not more than 1g;  
2. for batteries, the aggregate lithium content is not more than 2g;  
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, sub-section 38.3.

Composition : Positive electrode ; Vanadium pent-oxide 5~21wt%  
: Negative electrode ; Lithium alloy 0.2~2wt% (0.5~50mg)  
: Electrolyte ; Organic electrolyte 5~15wt%

### 3 Hazardous and Toxicity Class

Class name	: Not applicable for regulated class
Hazard	: Electrolyte is inflammable. Risk of explosion by fire if batteries are disposed in fire or heated above 100 degree C. Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.
Toxicity	: Vapor generated from burning batteries, may make eyes, skin and throat irritate.

### 4 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.

### 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 Measures for electrolyte leakage from the battery

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

## 7 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.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Do not let water penetrate into packaging boxes during their storage and transportation.
- Do not store the battery in places of the high temperature exceeding 35 degree. 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.
- Fire fighting apparatus should be installed.

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

- 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 Properties

- Appearance : Coin shape
- Voltage : 3 volts

## 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. But, we have no ecological information.

## 13 Disposal Considerations

When the battery is worn out, dispose of it under the ordinance of each local government or the law issued by relating 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.

For marine or air shipment, except for packages containing no more than 4 cells installed in equipment or no more than 2 batteries installed in equipment, each package shall meet the following:

<References (1)(3)>

1. Each consignment shall be accompanied with a document including the following:
  - ( i ) the package contains lithium metal cells or batteries;
  - ( ii ) the package shall be handled with care and that a flammability hazard exists if the package is damaged;
  - ( iii ) special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - ( iv ) a telephone number for additional information.
2. Each package shall be marked with the previous ( i ) to ( iv ). For air shipment, each package shall be labeled with a lithium battery handling label provided by IATA.
3. Except when lithium batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents.
4. Except when lithium batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass for marine shipment or 2.5 kg gross mass for air shipment.

For more information about Air shipment, refer to the Packing Instruction 968, 969 or 970 of IATA Dangerous Goods Regulations

## 15 Regulatory Information

IATA Dangerous Goods Regulations

ICAO Technical Instructions for the safe transport of dangerous goods by air

## 16 Other Information

This PSDS is described on the basis of present materials, information and data. So, please notice that it will be revised by new information. Also this sheet is supplied to entrepreneurs as reference information in order to handle batteries safely. Please notice that entrepreneur have to deal with batteries as they think fit.

- 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, September 7, 2000 / Notices
  - (3) IATA Dangerous Goods Regulations 50th Edition (2009)

Table: This PSDS is applicable to the following models.

VL621	VL1216	VL2020	VL2320	VL3032	
	VL1220		VL2330		

(END)