

This product is a consumer product which is used in a hermetically sealed state. So, it is not an object of the SDS system. This document is provided to customers as reference information for the safe handling of the product. The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Panasonic Corporation makes no warranty expressed or implied.

## PRODUCT SAFETY DATA SHEET

### 1 Chemical product and company identification

Name of Product : Vanadium pent-oxide lithium rechargeable battery (VL Series)  
Name of Company : Panasonic Corporation  
Address : 1-1 Matsushita-cho, Moriguchi-city, Osaka, 570-8511, Japan  
Emergency Contact : +81-6-6994-4560 (Working hours)  
+81-6-6991-1141 (Holiday)

### 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.	Content (%)
Positive electrode	Vanadium pent-oxide	1314-62-1	5 - 21
Negative electrode	Lithium	7439-93-2	0.2 - 2
	Aluminum	7429-90-5	2 - 13
Electrolyte	1,2-dimethoxyethane	110-71-4	1.5 - 4.5
	Organic electrolyte	-	4 - 10
Others (Steel or Plastic parts)	Steel	7439-89-6, 7440-47-3	53 - 87
	Polypropylene	9003-07-0	1 - 11

#### Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
VL621	0.001	VL1220	0.003	VL2020	0.01	VL3032	0.05
				VL2320	0.01		
				VL2330	0.02		

**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 affected area under tepid running water using a mild soap. If appropriate procedures are not taken, this may cause sores on the skin. Get medical attention if irritation develops or persists.
- Inhalation : Remove to fresh air immediately. Get medical treatment immediately.

**5 Firefighting measures**

- Fire extinguishing agent : Alcohol-resistant foam and dry sand are effective.
- Extinguishing method : Be sure on the windward to extinguish the fire, since vapor may make eyes, nose and throat irritate, Wear the respiratory protection equipment in some cases.

**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, deform, throw into fire or disassemble.
  - Charge according to the conditions specified.
  - 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 : For most condition no respiratory protection.  
Hand Protection : Safety gloves.  
Eye Protection : Safety goggle

**9. Physical and chemical properties**

Appearance : Coin shape  
Nominal 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**

Swallowing can lead to chemical burns, perforation of soft tissue, and death. Severe burns can occur within 2 hours of ingestion. Seek medical attention immediately.

**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****Handling**

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 dropped or damaged.

Proper shipping name : Lithium metal batteries

UN Number, UN Class : UN3090, Class9 (for the Air transport by PI968 Section IA or IB)  
: Exemption (for the Marine transport and the Air transport by Section II of PI 968, 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 , sub-section 38.3 ;
3. each cell is manufactured in ISO9001 certified factory ;
4. the test summary is available from ;

<https://industrial.panasonic.com/ww/downloads/battery-test-summary>

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(SP)	Note
Air transport	IATA DGR	PI 968 Section A	Cells, Cargo Aircraft only; Net quantity per package Max. 35kg
		PI 968 Section B	Cells, Cargo Aircraft only; net quantity per package Max. 2.5kg
		PI 968 Section	Cells, Cargo Aircraft only, not more than one package in any single consignment; net quantity per package Max. 2.5kg
		PI 969 Section	Cells packed with equipment
		PI 970 Section	Cells contained in equipment, button cell batteries
Marine transport	IMDG Code	SP 188	

**15. Regulatory information**

- IATA Dangerous Goods Regulations Edition 62 (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2018 Edition (IMDG Code)
- UN Recommendations on the Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on the 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)
- State of California Regulations - Best management practices for Perchlorate Materials
- Act on Preventing Environmental Pollution of Mercury (Japan)

**16. Other information**

This PSDS 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  
 Energy Device Business Division  
 Panasonic Corporation