

This product 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 : Manganese dioxide lithium battery
 Name of Company : Panasonic Energy Co., Ltd.
 Address : 1-1 Matsushita-cho, Moriguchi-city, Osaka, 570-8511, Japan
 Emergency Contact : +81-80-9932-3190 (JST Working hours)
 +81-6-6991-1141 (Holiday)

2 Hazards identification

GHS Classification : No 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 RN	Content (%)
Positive electrode	Manganese dioxide	1313-13-9	25 - 47
Negative electrode	Lithium metal	7439-93-2	2 - 5
Electrolyte	1,2-dimethoxyethane	110-71-4	3 - 7
	Propylene Carbonate	108-32-7	5 - 17
Others (Steel or Plastic parts)	Steel	7439-89-6, 7440-47-3	25 - 50
	Polypropylene	9003-07-0	3 - 15

Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
CR2	0.33	CR123A	0.6	CR-AAK	0.6	CR-AG	0.8
CR2U	0.33	CR-2/3AZ	0.6	CR-AAU	0.6	CR-AGZ	0.9
CR2Z	0.33	CR-2/3AU	0.6				

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 :
 - ž 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.
 - ž Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
 - ž Do not short-circuit, recharge, deform, throw into fire or disassemble.
 - ž Do not mix different type of batteries.
 - ž Do not solder directly onto batteries.
 - ž Insert the battery correctly in electrical equipment.
- Storage :
 - ž Do not let water penetrate into packaging boxes during their storage and transportation.
 - ž Do not store the battery in places of the high temperature or under direct sunlight.
 - ž 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 : Cylindrical 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 SP188 and the Air transport by Section II of PI 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 1 g ;

- 2. each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part I, sub-section 38.3 ;
- 3. each cell is manufactured in ISO9001 certified factory ;
- 4. the test summary is available from ;

*****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 969 Section	Cells packed with equipment
		PI 970 Section	Cells contained in equipment
Marine transport	IMDG Code	SP 188	

15. Regulatory information

- IATA Dangerous Goods Regulations Edition 64 (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2020 and 2022 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 Energy Co., Ltd.



Issued date: January 1, 2024

SAFETY DATA SHEET (SDS)

1. Product and Company identification

Product Category : Manganese Dioxide Primary Lithium Battery

Nominal Voltage : 3 V

Product name

Type	Lithium (g)
CR14250SE	0.29
CR14250SE-R	0.29
CR14250SEK	0.29
CR1/2 6·L	0.31
CR2/3 6·L	0.41
CR6·L	0.71
CR2/3 6L	0.43
CR1/2 6LHT	0.31
CR2/3 6LHT	0.43
CR2/3 8·L	0.57

Type	Lithium (g)
CR2/3 8LHT	0.57
CR8·L	0.87
CR8·LHC	0.90
CR8LHT	0.90
CR12600SE	0.52
CR17335SE	0.52
CR17335SE-R	0.52
CR17450SE	0.75
CR17450SE-R	0.75

Supplier's Name : FDK CORPORATION

Supplier's Address : 1-6-41, Konan, Minato-ku, Tokyo 108-8212 Japan
 Telephone +81-3-5715-7420

Emergency Contact : CHEMTREC at (800)424-9300

Note: 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.

2. Hazards identification

The important hazards and adverse effects of the chemical product	No information available
Chemical product - specific hazards	No information available
Outline of an anticipated emergency	Chemical contents are sealed in metal can. Therefore, risk of exposure never occurs unless battery is mechanically or electrically abused. Risk of explosion by fire is anticipated if batteries are disposed of in fire or heated above 100 degree Celsius. If the batteries are extremal short circuited or charged, the batteries may generate heat and explosion or fire.

Note) Our battery is not classified in accordance with the GHS classification.

3. Principal Composition/ information on Ingredients

Part	Material	CAS No.	Contents
Positive electrode	Manganese Dioxide	1313-13-9	30 ~ 50 wt%
Negative electrode	Lithium metal	7439-93-2	2 ~ 4 wt%
Electrolyte	Lithium perchlorate	7791-03-9	0.5 ~ 1.5 wt%
	1,2-Dimethoxyethane	110-71-4	3 ~ 4.5 wt%
	Mixture of organic solvent	N/A	5 ~ 15 wt%

4. First-aid measures

Inhalation	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.
Skin contact	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.
Eyes contact	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.
Swallowing	In case of swallowing of battery, immediately refer for medical attention.

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 short-circuit, disassemble, deform, heat or incinerate. 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. Do not mix the different type of batteries, the new and old batteries of the same type, or the different manufacture of the same type batteries. Do not use batteries for unspecified purposes.
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. Keep batteries out of reach of children.

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.

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 insulation 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 not more than 1g or the battery – lithium content is not more than 2g, so it is permitted to transport without using the Packing Group II package when it complies with all requirements of the transport conditions for Section IB.

Our products can be transported by cargo aircraft only since our products are classified into lithium metal batteries.

< Maritime 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 not more than 1g or the battery – lithium content is not more than 2g, so it is permitted to transport as Exempted Dangerous Goods when it complies with all requirements of the transport conditions.

Shipping names / Packing requirements

Proper Shipping Name	UN ID No.	Air transport	Maritime transport
Lithium metal batteries	3090	Packing Instruction 968	Special Provision 188
Lithium metal batteries packed with equipment	3091	Packing Instruction 969	Special Provision 188
Lithium metal batteries contained in equipment	3091	Packing Instruction 970	Special Provision 188

Related regulations: Following regulations shall be cited and considered.

	Organization / Issue documents
UN	UN / Recommendations on the Transport of Dangerous Goods • Model Regulations ; 22nd revised edition • Manual of Tests and Criteria: Subsection 38.3; 7th revised edition Amendment 1
Air transport	IATA (International Air Transport Association) / IATA Dangerous Goods Regulations ; 65th Edition *1
Maritime transport	IMO (International Maritime Organization) / IMDG Code ; 2022 Edition *2
Land transport (Intra-European)	RID (International Carriage of Dangerous Goods by Rail) , ADR (International Carriage of Dangerous Goods by Road)
USA	USDOT (US Department of Transportation) / DOT 49 CFR (US law)

Each country, region, or shipping company may have its own regulations, so please check with the shipping company in advance.

15. Applicable legislation

- EU Directive 2006/66/EC
- EU Regulation 2023/1542
- CA Lithium Perchlorate Regulation

16. Other information

Reference

- IATA Dangerous Goods Regulations, latest edition *1

Notes on this sheet

- *1 Dangerous Goods Regulations – 65th Edition: International Air Transport Association (IATA)
- *2 IMDG Code – 2022 Edition: International Maritime Organization (IMO)

This sheet refers to normal use of the product in question. FDK Corp. makes no warranty expressed or implied.