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Document No. SDS-CR-001-E

Safety Data Sheet

Note : SDS is not applicable to the products hermetically sealed. Under normal conditions of use, the battery is contained in a hermetic ally-sealed case, therefore the information herein contained is provided for your information only.
The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. However, Tohoku Murata Manufacturing Co., Ltd. MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON.

1. Product and company Identification

Product Name	Coin manganese dioxide lithium batteries
Model Name	CR1216%, CR1220%, CR1616%, CR1620%, CR1632%, CR2016%, CR2025%, CR2032%, CR2430%, CR2450%, CR2477% CR2032W%, CR2050S%, CR2050W%, CR2450S%, CR2450W%, CR2477W% CR2032X%, CR2450X%, CR2477X%, CR3677X% CR2032R%, CR2450R%
Brand	murata
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Date Revised	January 1, 2021
Issued Department	Business unit quality assurance department 3 Tohoku Murata Manufacturing Co., Ltd.

The model name attached % means that valid for all models which the singular/plural digits of alphanumeric or marks (including a space) attached after the model name.

2. Hazard 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	Hazard	Coin manganese dioxide lithium batteries contain flammable materials such as organic solvent and metallic lithium. If battery was disposed in fire, or battery temperature exceeded 100℃, explosion or ignition of the battery may be caused. When short-circuit is caused by jumbling the batteries, explosion or ignition may be caused due to heat generation.
	Toxicity	When battery is burned, generated vapor may cause eyes, skin and respiratory irritation.

3. Composition/information on ingredients

Portion	Ingredient	CAS No.	Content ratio wt%
Cathode	Manganese Dioxide	1313-13-9	20~40 wt%
Anode	Metallic Lithium	7439-93-2	1~3 wt% (Li < 0.3g *)
Electrolyte	Dimethoxyethane	110-71-4	1~6 wt%
	Propylene Carbonate	108-32-7	2~9wt%
	Lithium Perchlorate	7791-03-9	0.3~0.9wt%
	Acid Phthalic Anhydride	85-44-9	0~0.1wt%
Others	Heavy metal such as Mercury, Cadmium and Lead are not added in the battery.		

* CR3677X%: Metallic Lithium weight exceeds 0.3g to 1g or less.

4. First aid measures

Swallowing	Ingestion of a battery can be harmful. Contents of an opened battery can cause serious chemical burns of mouth, esophagus and gastrointestinal tract. In either case, do not induce vomiting nor give food or drink. Seek medical attention immediately.
Skin Contact	Contents of an opened battery can cause skin irritation. Wash skin with soap and water. If inflammation was caused on the skin, seek the medical attention.
Eye Contact	Contents of an opened battery can cause eye irritation. Immediately flush eyes thoroughly with water for several minutes. Seek medical attention.
Inhalation	Contents of an opened battery can cause respiratory irritation. Provide fresh air and call a doctor.

5. Fire fighting measures

Extinguishing Media	Powder, Carbon dioxide and Dry sand. Metallic Lithium contained in a battery reacts with water strongly, as a result, generates hydrogen gas. Extinguishing by water may cause explosion.

6. Accidental release measures (In the case that electrolyte is leaked from battery.)

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	Wipe off with dry cloth and keep away from fire.

7. Precautions for safe handling and use

Handling	Since improper battery handling may cause leakage, overheating or explosion of the battery, the following precautions shall be observed. (1) Keep batteries away from children. Swallowing a battery can cause chemical burn or penetration of the mucous membrane tissue, in the worst case, may result in death. If infant happens to swallow a battery, seek medical attention immediately to take it out. (2) Do not short. (3) Insert batteries with positive (+) and negative (-) terminals correctly oriented. (4) Do not mix different type batteries or mix new and old ones together. (5) Do not directly heat, solder or throw into fire. (6) Do not modify, deform or disassemble the battery. (7) Do not have children replace batteries unsupervised by adults. (8) In case of swallowed battery, seek medical attention immediately. (9) This battery is not designed for recharging. To do so can cause leakage or explosion.
Storage	Store in a cool, well-ventilated area. Do not store batteries at high-temperatures or high-humidity. Proper storage temperature is +5℃~+35℃. It is preferable not to exceed +35℃. Avoid extremely higher or lower humidity (85% or more, 45% or less). Avoid exposure to sunlight to prevent performance deterioration, swelling or leakage. Elevated temperature can result in shortened battery life. Since short circuit can cause burn hazard and leak or explode hazard, do not batteries jumbled in containers. Avoid to contact water, metallic chain or metallic chip which may result in short-circuit.

8. Exposure controls/personal protection

N/A

9. Physical and chemical properties

Condition	Solid
Appearance	Coin Shape
Nominal voltage	3 V

10. Stability and reactivity

Stability : Stable under normal conditions of use.
Condition to avoid : See Section 7.

11. Toxicological information

Under normal conditions of use, there is no risk to life and health, because ingredients of battery is hermetical sealed with metal case.

12. Ecological information

When exhausted battery is buried in the ground, it is confirmed that outflow of metal contained in the battery has been seldom found. But we have no ecological information.

13. Disposal considerations

When battery is disposed, isolate positive (+) and negative (-) terminals of the battery to avoid those terminals from touching each other.
Batteries may be short-circuited when piled up or mixed with the other batteries in disorder.
Dispose in accordance with applicable federal, state and local regulations.

14. Transport information

UN Dangerous Goods List

UN No.	Name and Description	Class or division	Special provision	Packing instruction
3090	LITHIUM METAL BATTERIES	9	188 230 310 376 377 384	P903 P908 P909 P910

【Sea transportation】

All lithium metal cells shipping from Tohoku Murata Manufacturing Co., Ltd. and their packing condition conform to the following regulations and meet the requirements, therefore they can be shipped as exemption from Class 9 Dangerous goods.

Outline of IMO-IMDG Code 2020 SP188

- For a lithium metal cell, aggregate lithium content is not more than 1g.
- Each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria 7th revised edition, Part Ⅲ, subsection 38.3.
- Cells shall be packed in inner packagings that completely enclose the cell.
- Each package shall be capable of withstanding a 1.2m drop test in any orientation without damage to cells contained therein, without shifting of the contents so as to allow battery to battery contact and without release of contents.
- Package shall not exceed 30kg gross mass.
- The specified information shall be indicated on each package.
- Each cell shall be manufactured under quality program specified by the United Nations.

【Air transportation】

For air transportation, it is necessary to comply with IATA DGR 62nd Edition (Dangerous Goods Regulations, 62nd Edition)

Dangerous Goods List on IATA DGR

UN No.	Proper Shipping Name/Description	Class or division	Packing Instruction	Passenger Aircraft	Cargo Aircraft	S.P.
3090	LITHIUM METAL BATTERIES	9	PI968 (Section IA)	Forbidden	Max Net Qty /Package 35kg	A88 A99 A154 A164 A183 A201 A206
			PI968 (Section IB)	Forbidden	Max Net Qty /Package 2.5 kg	
			PI968 (Section II)	Forbidden	Max Net Qty /Package 2.5 kg & Single package for single consignment	

※As all of murata Coin manganese dioxide lithium batteries contain lithium metals less than 1.0g, Packing Instruction 969/970 can be applicable to the products that murata Coin manganese dioxide lithium batteries are assembled into.
The equipment is excluded from dangerous goods regulation.

When our cell or battery is contained in equipment or packed with equipment, it is classified into UN3091.

※For the details of indication on package and document required for transportation, please refer to IATA DGR 62nd Edition (Dangerous Goods Regulations, 62nd Edition).

*Related regulation, Issued documents

- International Air Transport Association (IATA):Dangerous Goods Regulations, 62nd Edition
- International Civil Aviation Organization (ICAO): Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2021-2022 Edition
- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2020 Edition
- U.S. Department of Transportation (DOT) 49 CFR
- UN（SP188）:UN(United Nations):Recommendations on the Transport of Dangerous Goods: Model Regulations 21st revised edition

15. Regulatory information

- EU Directive 2006/66/EC and 2013/56/EU
- CA Lithium Perchlorate Regulation

16. Other information

If you need further information, please contact your local sales representative.