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SAFETY DATA SHEET

The batteries are exempt articles and are not subject to the OSHA Hazard Communication Standard Requirement. This sheet is provided as technical information only. The information and recommendations set forth are made in good faith and are believed to be accurate as of the date of preparation. However, **Maxell makes no warranty expressed or implied.**
SDS is provided as one document for group of battery product including each cell part number. Therefore, following SDS information covers not only the cell part number but also the part number which includes the tab / wiring designation. (ex. Cell part number; CR2050HR, Tab battery part number; CR2050HR HAB-T40 X)

Section 1 - Product and Company Identification

Product Name Heat Resistant Coin Type Lithium Manganese Dioxide Battery (CR)	Sizes: All	Date of issue: August 1, 2026
Company: Maxell, Ltd., Energy Division		Telephone Numbers: 81-(0)794-63-8054
Address (Number, Street, City, State, and ZIP Code): 5, Takumidai, Ono-shi, Hyogo 675-1322, Japan		Fax Numbers: 81-(0)794-63-8445

Section 2 - Hazards Identification

This contains lithium, organic solvent, and other combustible materials. For this reason, improper handling of the battery could lead to distortion, leakage*, overheating, explosion, or fire and cause human injury or equipment trouble. Please strictly observe safety instructions.
(* Leakage is defined as an unintended escape of liquid from a battery.)

Section 3 - Composition/Information on Ingredients

Ingredient		CAS#	Content (%)
Manganese Dioxide (MnO_2)		1313-13-9	25 to 35
Propylene Carbonate ($C_4H_6O_3$)		108-32-7	3 to 6
1,2-Dimethoxyethane ($C_4H_{10}O_2$)		110-71-4	2 to 5
Lithium Perchlorate ($LiClO_4$)		7791-03-9	0.1 to 1
1,3-Propanesultone		1120-71-4	0.1 to 1
Lithium or Lithium Alloy (Li)		7439-93-2	1 to 4
Graphite (C)		7782-42-5	1 to 4
Others	Steel	7439-89-6, 7440-47-3	40 to 55
(Steel or Plastic parts)	Polyphenylene sulfide	9016-75-5	2 to 6

NA=Not Applicable

Lithium content for each cell

Model	Li content (g)	Model	Li content (g)
CR2032HR	0.06	CR2050HR	0.1
CR2032HRP	0.06	CR2450HR	0.15
CR2032HRS	0.06	CR2450HR-EX	0.15

Section 4 - First Aid Measures

None unless internal materials exposure. If contents are leaked out, observe following instructions.

Inhalation	Fumes can cause respiratory irritation. Remove to fresh air and consult a physician.
Skin	Immediately flush skin with plenty of water. If itch or irritation by chemical burn persists, consult a physician.
Eyes	Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately.
Ingestion	Swallowing a battery can lead to death. If this occurs, seek immediate medical treatment from a physician. If battery contents are ingested, rinse the mouth thoroughly with plenty of water and seek immediate medical treatment from a physician.

Section 5 - Fire Fighting Measures

Extinguishing Media	Extinguisher of alkaline metal fire is effective. Plenty of cold water is also effective to cool the surrounding area and control the spread fire. But hydrogen gas may be evolved by the reaction of water and lithium and it can form an explosive mixture. Therefore in the case that lots of lithium metal batteries are burning in a confined space, use a smothering agent (e.g. carbon dioxide or dry sand).
Fire fighting procedure	Use self-contained breathing apparatus and full protective gear not to inhale harmful gas.

Section 6 - Accidental Release Measures

If the battery releases liquid, wipe it with a dry cloth.
Keep the battery away from fire or heat.

Section 7 - Handling and Storage

1) Handling

- **Never swallow.**

  Keep batteries at a place beyond the reach of an infant. If a battery is accidentally swallowed, see Section 4 - First Aid Measures.

- **Never charge.**
  The battery is not designed to be charged by any electrical source. Charging can generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion or fire.
- **Never heat.**
  Heating the battery to more than 100 deg. C can increase the internal pressure, causing distortion, leakage, overheating, explosion or fire.
- **Never expose to naked flames.**
  Exposing to naked flames can cause the lithium metal to melt, causing the battery to catch fire and explode.
- **Never disassemble or deform.**
  Disassembly or deforming the battery can cause leakage, overheating, explosion or fire due to internal short-circuits.
- **Never reverse the positive and negative terminals when inserting in electrical equipment.**
  Inserting the battery incorrectly can lead to short-circuiting, charging or forced-discharging. This can cause distortion, leakage, overheating, explosion or fire.
- **Never short-circuit the battery.**
  Do not allow the positive and negative terminals to short-circuit. Never carry or store the battery with metal objects such as necklaces or hairpins. Do not take multiple batteries out of the package and stack or mix them when storing. Otherwise, this could lead to distortion, leakage, overheating, explosion or fire.
- **Never weld the terminals or weld wire to the body of the battery.**
  The heat of welding or soldering can cause the lithium to melt or cause damage to the insulating material in the battery. This can cause distortion, leakage, overheating, explosion or fire.
- **Never use different batteries together.**
  Using different batteries together, i.e. different types or old/used and new or those of different manufacturers, can cause distortion, leakage, overheating, explosion or fire because of the differences in battery properties. Please consult Maxell before designing devices that use two or more batteries connected in a series or parallel, even with the same battery type.
- **Never touch liquid leaking from a battery.**
  If the liquid enters the eyes or mouth, see Section 4 - First Aid Measures.
- **Never allow battery liquid to come into contact with a naked flame.**
  If leakage or a strong odor is detected, keep the battery away from all naked flames. The leaked liquid is inflammable.
- **Never attach a battery to the skin.**
  Attaching a battery to the skin using tape, etc. should be avoided. Moisture from the skin can cause battery discharge, which can produce certain chemical substances that burn the skin.

2) Storage

Never let the battery contact with water. Never store the battery in hot and high humid place.

Section 8 - Exposure Controls, Personal Protection

Respiratory Protection	NA
Ventilation	NA
Eye Protection	NA
Protective Gloves	NA
Other protective clothing	NA

Section 9 - Physical/Chemical Characteristics

Coin shape with primary cell of 3V nominal voltage.

Section 10 - Stability and Reactivity

Stability: Stable (Performance deterioration depends on circumstance.)
Incompatibility: Water
Hazardous polymerization: Will not occur.
Condition to avoid: See section 7.
Hazardous Decomposition or Byproducts: Hydrogen (By moisture)

Section 11 - Toxicological Information

As the contents are sealed in the battery case, there is no toxicity.

Section 12 - Ecological Information

If the battery is disposed of on land or in water, the battery case may corrode and liquid leak from the battery. Ecological information has not been reported.

Section 13 - Disposal condition

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

Section 14 - Transportation Information

1) Shipping Name (UN Number): Lithium metal batteries (UN3090)
   Lithium metal batteries packed with equipment (UN3091)
   Lithium metal batteries contained in equipment (UN3091)
2) Hazard Classification: Class 9 (Miscellaneous)
3) Method of transportation: As the cells are manufactured under a quality management program in an ISO9001 certified factory and the cells meet all the requirements of a UN manual of tests and criteria, Part III, sub-section 38.3, the applicable packing instructions (PI) or special provisions (SP) are as per the following table.

The cells or batteries classified in Section II of any Packing Instruction or SP 188 may be exempted from Class 9 Dangerous Goods if complying with all requirements of applicable Section II or SP 188. But lithium metal cells and batteries transported as cargo are restricted to Cargo Aircraft Only.

Note. This does not apply to lithium metal batteries packed with equipment (PI 969) or contained in equipment (PI 970).

Li content per cell	Product name	Air See Section 15 4)			Sea* See Section 15 5)
		Cell only*	Cell packed with equipment	Cell contained in equipment	
1 g or less	CR2032HR, CR2032HRP, CR2032HRS, CR2050HR, CR2450HR, CR2450HR-EX	PI968 Section IB	PI969 Section II	PI970 Section II	SP188
more than 1 g	(No)	PI968 Section IA	PI969 Section I	PI970 Section I	SP230

PI: Packing Instruction, SP: Special Provision

* Batteries may only be transported individually when the customer intends to ship them using the original packaging as shipped by our company, if that packaging conforms to air or sea transport specifications.

As specific districts, countries and airlines may establish their own special requirements, the shipper must confirm requirements with the forwarder in advance.

Please confirm the aggregate lithium content when transport the battery.

Section 15 - Regulatory Information

Major applicable regulations for the transportation of lithium metal cells and batteries are as follows:

1) UN (United Nations) Recommendations on the Transport of Dangerous Goods: Model Regulations 23rd revised edition
2) UN (United Nations) Recommendations on the Transport of Dangerous Goods: Manual of Test and Criteria
3) ICAO (International Civil Aviation Organization): Technical Instructions for Safety Transport of Dangerous Goods by Air, 2025-2026 Edition
4) IATA (International Air Transport Association): Dangerous Goods Regulations, 67th Edition
5) IMO (International Maritime Organization): International Maritime Dangerous Goods (IMDG) Code, 2024 Edition

Major environmental regulations are as follows:

1) EU Battery Regulation (EU) 2023/1542
2) Packaging and Packaging Waste Regulation (EU) 2025/40
3) California Code of regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials

   Perchlorate Material -- special handling may apply,
   See www.dtsc.ca.gov/hazardouswaste/perchlorate.

Section 16 - Other Information

If you want further information, please contact Maxell sales representative.