maxell

SAFETY DATA SHEETS
Based on 1910.1200 App D

The batteries are articles and are not subject to the OSHA Hazard Communication Standard Requirement as shown in paragraph (b)(6)(v) of §1910.1200. 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.**

1. Identification

(a) Product identifier used on the label:

CR/maxell/3V/+

(b) Other means of identification:

Lithium manganese dioxide battery

(c) Recommended use of the chemical and restrictions on use:

See **7.Handling and storage**

(d) Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party:

Manufacturer: Hitachi Maxell, Ltd.
Address: 5, Takumidai, Ono-shi, Hyogo 675-1322, Japan
Tel: +81-(0)794-63-8054
Fax: +81-(0)794-63-8058

(e) Emergency phone number.

Tel: +81-(0)794-63-8054

2. Hazard(s) identification

(a) Classification of the chemical in accordance with paragraph (d) of §1910.1200

Chemical battery (Primary)

(b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200. (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones)

N/A

(c) Describe any hazards not otherwise classified that have been identified during the classification process

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.)

(d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration ≥1% and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required

No such an ingredient is contained in the product.

3. Composition/information on ingredients

Except as provided for in paragraph (i) of §1910.1200 on trade secrets:

For Substances:

(a) Chemical name

(b) Common name and synonyms

(c) CAS number and other unique identifiers

(d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance

Chemical Name	Common Name and Synonyms	CAS #	Content (Wt %)
Manganese Dioxide	MnO_2	1313-13-9	15 to 40
Propylene Carbonate	$C_4H_6O_3$	108-32-7	2 to 6
1,2-Dimethoxyethane	$C_4H_{10}O2$	110-71-4	1 to 5
Lithium Perchlorate	$LiClO_4$	7791-03-9	0.1 to 1.5
Lithium or Lithium Alloy	Li	7439-93-2	1 to 5
Graphite	C	7782-42-5	1 to 4

Lithium content for each cell

Model	Li content (g)	Model	Li content (g)
CR1216	0.008	CR2016	0.03
CR1220	0.011	CR2025	0.05
CR1616	0.02	CR2032	0.07
CR1620	0.025	CR2032H	0.07
CR1632	0.04	CR2430	0.09
		CR2450	0.18

For Mixtures

In addition to the information required for substances:

(a) The chemical name and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of §1910.1200 and

(1) Are present above their cut-off/concentration limits; or

(2) Present a health risk below the cut-off/concentration limits.

No such an ingredient is contained in the product.

(b) The concentration (exact percentage) shall be specified unless a trade secret claim is made in accordance with paragraph (i) of §1910.1200, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (See A.0.5.1.2) with similar chemical composition. In these cases, concentration ranges may be used.

No such a situation would happen during the production from batch to batch.

For All Chemicals Where a Trade Secret is claimed

Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

4. First-aid measures

(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion

Inhalation	Fumes can cause respiratory irritation. Remove to fresh air and consult a physician.
Skin Contact	Immediately flush skin with plenty of water. If itch or irritation by chemical burn persists, consult a physician.
Eye Contact	Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately
Ingestion	If swallowing a battery, consult a physician immediately. If contents come into mouth, immediately rinse by plenty of water and consult a physician.

(b) Most important symptoms/ effects, acute and delayed

NA.

(c) Indication of immediate medical attention and special treatment needed, if necessary

Wash with clean water immediately.

5. Fire-fighting measures

(a) Suitable (and unsuitable) 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.

(b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products).

Hydrogen gas may be evolved by the reaction of water and lithium and it can form an explosive mixture. Therefore when lots of lithium batteries are burning in a confined space, use a smothering agent (ex. Carbon dioxide or dry sand).

(c) Special protective equipment and precautions for fire-fighters.

Use self-contained breathing apparatus and full protective gear not to inhale harmful gas.

6. Accidental release measures

(a) Personal precautions, protective equipment, and emergency procedures.

Wear protective clothing. Keep unprotected persons away.

(b) Methods and materials for containment and cleaning up.

When the liquid leaks out of the battery, absorb and wipe it with dry cloth.

Keep the battery away from fire or heat.

7. Handling and storage

(a) Precautions for safe handling.

● Never swallow.

If swallowed, see Section 4 - First Aid Measures.

● Never charge.

The battery is not designed to be charged by any other electrical source. Charging could generate gas and internal short-circuiting, leading to distortion, leakage, overheating, explosion, or fire.

● Never heat.

Heating the battery to more than 100 degree centigrade could increase the internal pressure, causing distortion, leakage, overheating, explosion, or fire.

● Never expose to open flames.

Exposing to flames could cause the lithium metal to melt, causing the battery to catch on

fire and explosion.

● Never disassemble the battery.

Do not disassemble the battery, because the separator or gasket could be damaged, leading to distortion, leakage, overheating, explosion or fire.

● Never reverse the positive and negative terminals when mounting.

Improper mounting of the battery could lead to short-circuiting, charging or forced-discharging. This could 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 a necklace or a hairpin. Do not take multiple batteries out of the package and pile or mix them when storing. Otherwise, this could lead to distortion, leakage, overheating, explosion, or fire.

● Never weld the terminals or weld a wire to the body of the battery directly.

The heat of welding or soldering could cause the lithium to melt, or cause damage to the insulating material in the battery. This could cause distortion, leakage, overheating, explosion, or fire.

● Never use different batteries together.

Using different batteries together, i.e. different type or used and new or different manufacturer could cause distortion, leakage, overheating, explosion, or fire because of the differences in battery property.

● Never allow liquid leaking from the battery to get in your eyes or mouth.

If the liquid comes into eyes, or mouth, see Section 4 - First Aid Measures.

●Keep leaking batteries away from fire.

If leakage is suspected or you detect a strong odor, keep the battery away from fire, because the leaked liquid could catch on fire.

● Never touch the battery electrodes.

Do not allow the battery electrodes to come in contact with your skin or fingers. Otherwise, the moisture from your skin could cause a discharge of the battery, which could produce certain chemical substances causing you to receive a chemical burns.

(b) Conditions for safe storage, including any incompatibilities.

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

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8. Exposure controls/personal protection

(a) OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit

used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.

N/A

(b) Appropriate engineering controls.

Do not disassemble the product without professional basis.

(c) Individual protection measures, such as personal protective equipment.

No special equipment is required for handling, carrying or using the product.
The chemical materials concluded in the Product is sealed up, thus being stable, safe and eco-friendly under common conditions.

9. Physical and chemical properties

(a) Appearance (physical state, color, etc.)	:	The appearance is a coin shape and it is a primary cell with 3V nominal voltage.
(b) Odor	:	not applicable
(c) Odor threshold	:	not applicable
(d) pH	:	not applicable
(e) Melting point/ freezing point	:	not applicable
(f) Initial boiling point and boiling range	:	not applicable
(g) Flash point	:	not applicable
(h) Evaporation rate	:	not applicable
(i) Flammability (solid, gas)	:	not applicable
(j) Upper/lower flammability or explosive limits	:	not applicable
(k) Vapor pressure	:	not applicable
(l) Vapor density	:	not applicable
(m) Relative density	:	not applicable
(n) Solubility(ies)	:	not applicable
(o) Partition coefficient: n-octanol/ water	:	not applicable
(p) Auto-ignition temperature	:	not applicable

(q) Decomposition temperature : not applicable

(r) Viscosity : not applicable

10. Stability and reactivity

(a) Reactivity

N/A

(b) Chemical stability

Stable (performance deterioration depends on circumstance.)

(c) Possibility of hazardous reactions

No.

(d) Conditions to avoid (e.g., static discharge, shock, or vibration)

See **7.Handling and storage**

(e) Incompatible materials

Water

(f) Hazardous decomposition products

Hydrogen (By moisture).

11. Toxicological information

Description of the various toxicological (health) effects and the available data used to identify those effects, including

(a) Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact)

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

(b) Symptoms related to the physical, chemical and toxicological characteristics

People might feel itching, if the inner liquid splashes onto skin.

(c) Delayed and immediate effects and also chronic effects from short- and long-term exposure

N/A

(d) Numerical measures of toxicity (such as acute toxicity estimates)

N/A

(e) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA

No.

12. Ecological information (Non-mandatory)

(a) Ecotoxicity (aquatic and terrestrial, where available): N/A

(b) Persistence and degradability: N/A

(c) Bio-accumulative potential: N/A

(d) Mobility in soil: N/A

(e) Other adverse effects (such as hazardous to the ozone layer) : If the battery is disposed in land or water, battery case may be corroded and the liquid may leak out of the battery. Information regarding ecological concerns has not been reported.

13. Disposal considerations (Non-mandatory)

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.

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.

14. Transport information (Non-mandatory)

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 programme in the ISO9001 certified factory and the cells meet all the requirements in 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 SP188 may be exempted from Class 9 Dangerous Goods if complying with all requirements of applicable Section II or SP188. But Lithium metal cells and batteries transported as cargo are

restricted to Cargo Aircraft Only since January 1st 2015.

Note. The prohibition 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	
not more than 0.3 g	CR1216, CR1220, CR1616, CR1620, CR1632, CR2016, CR2025, CR2032, CR2032H, CR2430, CR2450	PI968 Section II	PI969 Section II	PI970 Section II	SP188
more than 0.3 g but not more than 1 g	(No)	PI968 Section IB (8 or less cells: Section II)	PI969 Section II	PI970 Section II	SP188
more than 1 g	(No)	PI968 Section IA	PI969 Section I	PI970 Section I	SP230

As the related district, country or airline may establish their special requirements, the shipper shall confirm them with the forwarder in advance.

Please confirm the aggregate lithium content when transport the battery.

(a) UN proper shipping name: Lithium metal batteries

(b) Packing group, if applicable: as table mentioned above

(c) Environmental hazards (e.g., Marine pollutant (Yes/No)) No.

(d) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

N/A for Annex II of MARPOL 73/78 and the IBC Code.
The products can be transported if complying with ICAO Technical Instructions or IMDG-Code.

(e) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises

Avoid high-temperature, high-humidity condition.

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 18th revised edition

2) UN(United Nations) Recommendations on the Transport of Dangerous Goods: Manual of Test and Criteria 5th revised edition, Amendment 2

3) International Civil Aviation Organization (ICAO): Technical Instructions for Safety Transport of Dangerous Goods by Air, 2015-2016 Edition

4) International Air Transport Association (IATA): Dangerous Goods Regulations, 57th Edition

5) International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2014 Edition

Major environmental regulations are as follows:

1) EU BATTERY DIRECTIVE (2006/66/EC)

2) California Code of regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials

16. Other information, including date of preparation or last revision

The date of preparation of the SDS or the last change to it

This Safety Date Sheets (SDS) is issued on 1 Jan, 2016 according to requirements of the USA's OSHA Standard 1910.1200 App D.

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