MITSUBISHI ELECTRIC
Changes for the Better

Product	MELSEC-Q
Title	PRODUCT SAFETY DATA SHEET for Q3MEM-BAT
Abstract	This document is the product safety data sheet for Q3MEM-BAT (CR2450HR produced by Hitachi Maxell, Ltd., Energy Division).

FA System Dept.1 MELSEC Technical Center

MITSUBISHI ELECTRIC CORPORATION NAGOYA WORKS

Reference No.: CH150101-1

PRODUCT 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.**

Section 1 - Product and Company Identification

Product Name	Sizes:	Date of preparation:
Heat Resistant Coin Type Lithium Manganese Dioxide Battery (CR)	All	Jan. 1, 2015

Company:	Telephone Numbers:
Hitachi Maxell, Ltd., Energy Division	81-(0)794-63-8054
Address (Number, Street, City, State, and ZIP Code):	Fax Numbers:
5, Takumidai, Ono-shi, Hyogo 675-1322, Japan	81-(0)794-63-8445

Section 2 - Composition/Information on Ingredients

Ingredient	CAS#	Content (wt %)
Manganese Dioxide (MnO_2)	1313-13-9	20 to 40
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 4
Lithium Perchlorate ($LiClO_4$)	7791-03-9	0.1 to 1
Lithium or Lithium Alloy (Li)	7439-93-2	1 to 4
Carbon (C)	7782-42-5	1 to 4

Lithium content for each cell

Model	Li content (g)	Model	Li content (g)
CR2450HR	0.15	CR2050HR	0.1
CR2450HR-EX	0.15		

Section 3 - 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 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	If swallowing a battery, consult a physician immediately. If contents come into mouth, immediately rinse by plenty of water and consult 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 when lots of lithium batteries are burning in a confined space, use a smothering agent (ex. 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

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

Keep the battery away from fire or heat.

Section 7 - Handling and Storage

1) 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.

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	Local Exhaust	NA
	Mechanical	NA
	Special	NA
	Other	NA
Eye Protection		NA
Protective Gloves		NA
Other protective clothing		NA

Section 9 - Physical/Chemical Characteristics

The appearance is a coin shape and it is a primary cell with 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 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.

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 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	CR2450HR-EX, CR2450HR, CR2050HR	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.

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 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, 56th Edition
5) International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2014 Edition

Section 16 - Other Information

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

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