

MATERIAL SAFETY DATA SHEET

The batteries are exempt articles and are not subject to the OSHA Hazard Communication Standard Requirement. This sheet is only provided as technical information and is referred normal use of the product in question. Zeus makes no warranty expressed or implied.

SECTION 1 - Product and Company Identification

⚡ Product Name: Coin type Lithium Manganese-Dioxide Batteries (CR)	Sizes: All
⚡ Company: PowerCell LLC dba ZEUS Battery Products	Telephone Number: +1 (630) 295-6800
⚡ Address: 191 Covington Dr. Bloomington, IL 60108 USA	Fax Number: +1 (630) 295-6801
	Date of Preparation: January 10th, 2019

SECTION 2 - Composition / Information on Ingredients

Ingredient	CAS#	Content (wt %)
Manganese Dioxide	1313-13-9	15 to 40
Propylene Carbonate	108-32-7	2 to 6
1,2-Dimethoxyethane	110-71-4	1 to 5
Lithium Perchlorate	7791-03-9	0 to 1.5
Lithium or Lithium Alloy	7439-93-2	1 to 5
Graphite	7782-42-5	1 to 4

*) Lithium content for each cell

Model	Li content (g)	Model	Li content (g)
CR2012	0.014	CR2032	0.065
CR2016	0.025	CR2430	0.090
CR2025	0.048	CR2450	0.165
CR1632	0.038	CR1220	0.012
CR1620	0.030	CR1216	0.008
CR1616	0.016	CR927	0.008
CR1025	0.008	CR2477	0.290
CR1225	0.015	CR3032	0.170
CR2325	0.060	CR2320	0.045
CR2330	0.072	CR2354	0.155

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 have leaked, observe the 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 In cases of accidental swallowing, 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 in the case that lots of lithium batteries are burning in a confined space, use a smothering agent.

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

SECTION 6 - Accidental Release Measures

NA

SECTION 7 - Handling and Storage

1.) Handling - Never swallow. Never charge. Never heat. Never expose to open flame. Never disassemble. Never reverse the positive and negative terminals when mounting. Never short-circuit the battery. Never weld the terminal or wire to the body of the battery directly. Never use different batteries together. Never touch the liquid leaked out of battery. Never bring fire close to battery liquid. Never keep in touch with battery.

2.) Storage - Never let the battery come into contact with water. Never store the battery in hot and high humidity environment.

SECTION 8 - Exposure Controls, Personal Protection

Respiratory Protection	NA
Ventilation - Local Exhaust	NA
Mechanical	NA
Special	NA
Other	NA
Eye Protection	NA
Protective Glove	NA
Other protective clothing	NA

SECTION 9 - Physical / Chemical Characteristics

Normal Voltage: 3.0V

SECTION 10 - Stability and Reactivity

Stability	Stable
Incompatibility	Water
Hazardous polymerization	Will not occur
Condition to avoid	See section 7
Hazardous Decomposition or Byproducts	Hydrogen

SECTION 11 - Toxicological Information

NA

SECTION 12 - Ecological Information

NA

SECTION 13 - Disposable Information

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

Shipping Name (UN Number) lithium metal batteries (UN3090)
 lithium metal batteries packed with equipment (UN3091)
 lithium metal batteries contained in equipment (UN3091)

Hazard Classification class 9 (Miscellaneous)

Organizations governing the transport of lithium batteries

Area	Method	Organization	Special Provision
International	Air	IATA, ICAO	Packing instruction 968 section II
International	Marine	IMO	SP188
U.S.A	Air, Rail, Road, Marine	DOT	49 CFR Section 173.185

Their regulations are based on the UN Recommendations. Each special provision provides specifications on exceptions and packaging for lithium metal batteries shipping. The products can be transported as "Non Dangerous Goods" when they meet the requirements of packing instruction 968 Section II of 2019 IATA-DGR (60th Edition) or SP188 of IMDG Code (Amdt. 38-16) 2016 Edition.

SECTION 15 - Regulatory Information

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

- UN Model Regulations: United Nations ST/SG/AC.10/11/Rev.6/Section 38.3, Recommendations on the Transport of Dangerous Goods
- International Civil Aviation Organization (ICAO): Technical instructions for the Safe Transport of Dangerous Goods by Air, 2016 edition
- International Air Transport Association (IATA): Dangerous Goods Regulations, 59th Edition
- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, (Amdt. 38-16) 2016 edition

SECTION 16 - Other Information

If you need further information, please contact a Zeus sales representative.