

MATERIAL SAFETY DATA SHEET

Manufacturer

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Ref. No. : LI/CB/SPEC.
Issued : 01/JAN/2025
File number : SW20240101P027SEA MSDS

Name of Product : Lithium Metal Cell
Chemical System : MnO₂/Li
Volts : 3V.
Model no. & Composition : Please see page 8

1) Substance Identification

Substance : Lithium Metal Cell
UN Class : Even classified as Metal Cell , they are exempted from Dangerous Goods. UN-Recommendations on the Transport of Dangerous Goods Model Regulations: (ST/SG/AC.10/1 Rev. II)
Lithium cell are not subject to the UN Regulation if they meet the following provisions.
The equivalent Lithium content calculated by 0.3 times of the rated capacity in Ampere=hour (Ah) is not more than 1 g. (1)
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for Cells, the aggregate lithium content is not more than 1g,
1) For Cells, the aggregate lithium content is not more than 1g,



- 2) each cell is of the type proven to meet the requirement of each test in the UN Manual of Test and Criteria Part III subsection 38.3.
- 3) they are out of scope for IATA SP A154 and comply with IATA SP A164, under IMDG Special Provision 188, 310, 957 & DOT 49 CFR Section 173.185 for shipment to USA only.
- 4) Each cell is un-regulated by IMDG Special Provision 230, because it is not rechargeable cell & due to the low energy storage capacity.
- 5) The cell complies with the special provision 188 of IMDG CODE (Amdt. 41-22) 2022 Edition, and not subject to other provisions of the code.

2) Hazardous and Toxicity Class

Class Name	: Not applicable for regulated class.
Hazard	: It may cause heat generation or electrolyte leakage If battery terminate contact with other metals, Electrolyte is flammable. In case of electrolyte Leakage, move the cell from fire immediately.
Toxicity	: Vapor generated from burning cells, may make Eyes, skin and throat irritate.

3) First Aid Measures

The product contains organic electrolyte, in case of electrolyte leakage from the cell, actions described below are required.

Eye contact	: Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Take a Medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.
Skin contact	: Wash this contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
Inhalation	: Remove to fresh air immediately. Taken a medical treatment.



4) Fire Fighting Measures

Extinguishing method	: Since vapor, generated from burning cells may make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.
Fire extinguishing agent	: Dry chemical, alcohol-resistant foam, carbon dioxide and plenty of water are effective.

5) Measures for electrolyte leakage from cell

- Take up with absorbent cloth.
 - Move the cell away from the fire.
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6) Handling and Storage

1. When packing the cells, do not allow cell terminals to contact each other, or contact with other metals. Be sure to pack cells by providing in the packaging box, or in a separate plastic bag so that the single cells are not mixed together.
2. Use strong materials for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation. (1) (2) (3)
3. Do not let water penetrate into packaging boxes during their storage and transportation.
4. The cells will be stored at room temperature.
5. Do not store the cell in places of the high temperature exceeding 35 deg. C or under direct sunlight or in front of a stove. Please also avoid the places of high humidity. Be sure not to expose the cell to condensation, water drop or not to store it under frozen condition.
6. Cells are sure to be packed in such a way to prevent short circuits under conditions normally encountered in transport. (1) (2) (3)
7. Please avoid storing the cell in the places where it is exposed to the electricity so that no damage will not be caused to the protection circuit of the cell pack.



7) Accidental release measures

Personal precautions: Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured cells. Avoid eye or skin contact and inhalation of vapours.

Increase ventilation. Clean up personnel should wear appropriate protective gear.

Environmental precautions: Not applicable

Methods for cleaning up: Not applicable

8) Physical and chemical properties

Form and Colour: Lithium Metal Cell. Contents dark in colour.

Odour: Not applicable

Change in physical state

Melting point/melting range: Not available

Boiling point/boiling range: Not available

Flash point: Not applicable

Explosion limits: Not available

Ignition temperature: Not available

Vapour pressure: Not available

Specific Gravity: Not available

% Volatiles: Not available

Solubility in water: Not applicable

Solubility in other solvents: Not applicable

pH value: Not applicable

Octanol/water partition coefficient (log POW): Not available

Viscosity: Not available

9) Toxicological information

Toxicity information is available on the cell ingredients noted in Substance Identification but, generally not applicable to intact cells.

Chronic Health Effects: Not applicable to intact cell.

10) Ecological information

None available regarding product. The cells are non-dangerous goods



(Non-hazardous & Non-flammable).

11) Exposure Control (in case of electrolyte leakage from the cell)

Acceptable concentration	: Not specified in ACGIH (4)
Facilities	: Provide appropriate ventilation system such as local ventilator in the storage place.
Protective	: Gas mask for organic gases, safety goggles, safety gloves.

12) Stability and Reactivity

Since cells utilize a chemical reaction they are actually considered a chemical product. As such, cell performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as charge, discharge, ambient temperature etc are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the cell is used may be damaged by electrolyte leakage.

13) Disposal Considerations (Precautions for recycling)

- When the cell is worn out, dispose of it under the ordinance of each local government or the law issued by relating government.
- Disposal of the worn-out cell may be subjected to Collection and Recycling Regulation.

14) Transportation Information

- During the transportation of a large amount of cells by ship, trailer or railway, do not leave them in the place of high temperatures and do not allow them to be exposed to condensation.
- During the transportation do not allow packages to be fallen down or damaged.
- Lithium metal cells identified by manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g.



those being returned to the manufacturer for safety reasons).

- Except when installed in equipment, for air shipment that contain one or more cells, they are necessary to meet the following items
 1. Each consignment must be accompanied with a document such as air waybill with an indication that:
 - the package contains lithium metal cell.
 - the package must be handled with care and that a flammability hazard exists if the package is damaged:
 - special procedures should be followed in the event the package is damaged, to include inspection and repacking necessary: and
 - a telephone number for additional information.
 2. Each package must be labeled with a lithium metal cell handling label.
 - *The width 120mm*length 110mm sized lithium metal cell handling label must be labeled onto the side of a package without bending it.
 3. Each package must be capable of withstanding a 1.2m drop test in any orientation.
 - damage to cells contained therein:
 - shifting of the contents so as to allow cell to cell contact:
 - release of contents.
 4. Quantity per package shall not exceed 30 kg by vessel.
 5. Each package containing more than four cells installed in equipment must be complied with above item 1 and 2.
- Recommendations on the transport of dangerous goods –Model Regulations 18th revised edition, IATA Special Provision A154 and IMDG Special Provision 188. must be marked “PRIMARY LITHIUM BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT”or “LITHIUM METAL BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT.” This marking is not required on packages that contain 5 kg (11 pounds) net weight or less of primary lithium batteries and cells that are contained in or packed with equipment. SP 310 add test provisions, limit exceptions. SP 957 - Allow transport until 31 Dec [2015] of LI cells and batteries manufactured before 1 Jan 03 and not tested iaw UN Manual of T&C (also applies to articles containing them) & DOT 49 CFR Section 173.185 for shipment to USA only.

15) Under Regulatory Information

- IATA DANGEROUS GOODS REGULATIONS 66th Edition 2025.
- IMDG Dangerous Goods Regulations & DOT 49 CFR Section 173.185 for



shipment to USA only.

- ICAO Technical Instructions for the safe transport of dangerous goods.

16) Others

References

1. UN Recommendations on the Transportation of Dangerous Model Regulations (ST/SG/AC.10/1/Rev.11)
2. Federal Register/Vol.65, No. 174/ Thursday, September 7, 2000/ Notice.
3. IATA DANGEROUS GOODS REGULATIONS 66th Edition 2025 TLVs and BELs 1999 ACGIH

If transport condition accords with special provision A154 & A164 of IATA-DGR, special provision 188, 310, 957, 230 of IMO-IMDG or DOT 49 CFR Section 173.185 for shipment to USA only, it is not recognized as Dangerous Goods, This shipment does not contain recalled/defective battery or cell and meeting special provision A154 of DGR.

REMARK: Consignments have to be handled with care. Flammability Hazard exists if the package is damaged, to include inspection and repacking if necessary; Special Procedure should be followed in the event the package is damaged. In case of fire in an adjacent area, use water, CO2 or dry chemical. (Measures for electrolyte leakage from cell : take up with absorbent cloth & move the cell away from the fire)



Composition

Model No.	Propylene carbonate (g)	Manganese dioxide (g)	Dimethoxyethane (g)	Lithium Perchlorate (g)	Graphite (g)	Stainless Steel (g)	Plastic (g)	Teflon (g)	Lithium (g)	Approx Weight (total g)	Dimensions	Capacity
CAS No.	108-32-7	1313-13-9	110-71-4	7791-03-9	7782-42-5	12597-68-1	9003-07-0	9002-84-0	14809-39-3			
CR1025	0.036	0.247	0.034	0.018	0.024	0.456	0.064	0.002	0.019	0.9	ø10*2.5mm	30mAh
CR1216	0.034	0.14	0.019	0.005	0.014	0.456	0.022	0.002	0.008	0.7	ø12.5*1.6mm	30mAh
CR1220	0.047	0.225	0.033	0.01	0.027	0.504	0.036	0.003	0.015	0.9	ø12.5*2.0mm	38mAh
CR1225	0.044	0.279	0.042	0.021	0.027	0.52	0.05	0.002	0.015	1.0	ø12.5*2.5mm	50mAh
CR1616	0.055	0.198	0.031	0.009	0.025	0.726	0.034	0.003	0.019	1.1	ø16*1.6mm	50mAh
CR1620	0.055	0.325	0.052	0.025	0.03	0.731	0.06	0.003	0.017	1.3	ø16*2.0mm	70mAh
CR1632	0.108	0.729	0.097	0.05	0.071	1.069	0.127	0.007	0.042	2.3	ø16*3.2mm	120mAh
CR2016	0.083	0.457	0.074	0.039	0.056	0.993	0.074	0.004	0.024	1.8	ø20*1.6mm	75mAh
CR2025	0.113	0.655	0.1	0.052	0.063	1.385	0.085	0.005	0.047	2.5	ø20*2.5mm	150mAh
CR2032	0.183	0.87	0.126	0.027	0.102	1.5	0.123	0.009	0.065	3.0	ø20*3.2mm	220mAh
CR2320	0.138	0.942	0.123	0.045	0.093	1.497	0.114	0.009	0.039	3.0	ø23*2.0mm	130mAh
CR2325	0.161	1.033	0.144	0.052	0.105	1.799	0.136	0.007	0.063	3.5	ø23*2.5mm	180mAh
CR2330	0.228	1.236	0.16	0.072	0.12	1.916	0.196	0.008	0.064	4.0	ø23*3.0mm	250mAh
CR2335	0.221	1.316	0.158	0.069	0.127	1.923	0.192	0.012	0.082	4.1	ø23*3.5mm	300mAh
CR2354	0.29	2.929	0.202	0.095	0.296	2.142	0.189	0.025	0.132	6.3	ø23*5.4mm	530mAh
CR2430	0.189	1.378	0.134	0.059	0.135	2.079	0.151	0.008	0.067	4.2	ø24*3.0mm	270mAh
CR2450	0.33	3.15	0.2	0.13	0.31	2.21	0.21	0.02	0.18	6.7	ø24*5.0mm	600mAh
CR2477	0.59	5.49	0.36	0.23	0.55	2.7	0.23	0.04	0.29	10.5	ø24*7.7mm	950mAh
CR3032	0.237	2.148	0.187	0.053	0.225	3.52	0.211	0.144	0.175	6.9	ø30*3.2mm	580mAh

