# 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**<br>Lithium ion cell (ICP463048XS) | No.<br>LBF09301ST | Issued Date June 09, 2023 |
| **Company**<br>Maxell, Ltd. Energy Division | | Tel:<br>(+81) -(0)75-956-4161 |
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## Section 2 - Hazards Identification

For the lithium ion cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperature and pressures encountered during normal use. As a result, during normal use, there is no danger of leakage of hazardous materials.

However, incorrect usage may result in breakage of safety vent due to increased internal pressure or, in the worst case, leakage of contents due to rupture of the external can. Since these substances may cause injury or device failure, adequate caution should be followed.

・GHS classification: Not available

## Section 3 – Composition / Information on Ingredients

| Components | CAS No. | Content（wt%） |
|---|---|---|
| Lithium cobalt dioxide (LiCoO2)<br>+ Lithium Nickel Cobalt Complex Dioxide | 12190-79-3,<br>193214-24-3 | Less than 41<br>(less than 5wt% as Ni oxide) |
| Electrolyte Solution ($LiPF_6$, Ethylene Carbonate, other Chain Carbonate) | 21324-40-3,<br>96-49-1, etc | Less than 16 |
| Graphite（C） | 7782-42-5 | Less than 20 |
| Aluminum （Al） | 7429-90-5 | Less than 22 |
| Copper（Cu）, Nickel（Ni）, etc | 7440-50-8, etc | residue |

## Section 4 – First-aid Measures

If contents leak, observe following instructions.

| | |
|---|---|
| Inhalation: | Fumes can cause respiratory irritation. Remove the exposed person from the area immediately and provide fresh air. Seek medical attention if necessary. |
| Skin contact: | Immediately flush contaminated skin with plenty of water. Contact physician if irritation continues. |
| Eye contact: | Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention. |

## 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 of fire. But hydrogen gas may evolve by through the reaction of water and lithium and it can form an explosive mixture. Therefore, in the case that lots of lithium ion cells 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 to be sure not to inhale harmful gas. Extinguish a fire from the windward (upwind) direction as much as possible. |

## Section 6 – Accidental Release Measures

If the electrolyte leaks, ventilate to avoid inhalation of the vapor, and remove the spilled electrolyte using absorbent material, etc. in addition to wearing appropriate protective equipment to avoid contact with the skin.

## Section 7 – Handling and Storage

Handling suggestions of the cell and battery

- Do not immerse or wet the cell in water
- Do not put into a fire or heat it. Do not solder the cell directly.
- Do not use or leave in a place near fire or heaters.
- Do not disassemble.
- Do not apply a mechanical shock or deform.
- Avoid polarity reverse connection when installing the battery to an instrument.

- Do not connect the positive terminal to the negative terminal directly.
- Do not use unauthorized charger or other charging method.
- Do not connect the battery directly to an electrical outlet or cigarette socket in a car.

Storage

- Store in a cool place but prevent condensation on cells or batteries
- Charge the battery every 6 months to the amount specified by the manufacturer, even if the battery is not used.

## Section 8 – Exposure Controls, Personal Protection

| | |
|---|---|
| Respiratory Protection | N/A |
| Hand Protection | N/A |
| Eye Protection | N/A |
| Skin and body protection | N/A |
| Ventilation | N/A |
| Other protective clothing | N/A |

## Section 9 – Physical/Chemical Characteristics

Appearance (cell):

A metal can with a negative terminal at the top

There are also varieties with insulating seals in the negative terminal part to prevent short circuits.

## Section 10 – Stability and Reactivity

Stability: Normally stable according to the handling/storage precautions described in Section 7

Possibility of hazardous reactions:

The contents may leak due to rupture of the external cans or breakage of safety vent.

Conditions to Avoid: Refer to section 7

Hazardous decomposition products:

Hydrogen (formed in reaction with water),

Hydrogen fluoride (formed in reaction with water if the electrolyte leaks)

## Section 11 – Toxicological information

There is no toxicity unless the contents leak.

However, if the contents leak, $LiPF_6$ and organic solvents contained in the electrolyte are toxic and irritate the skin and eyes. Leaked gas also irritates the skin and eyes.

The cell/battery contains the following chemical components:

| Components | ACGIH |
|---|---|
| Lithium cobalt dioxide ($LiCoO_2$) | 0.02 mg/$m^3$ as Co |
| Lithium Nickel Cobalt Complex Dioxide | 1mg/ $m^3$ as Ni |
| Lithium hexafluorophosphate ($LiPF_6$) | 2.5 mg/$m^3$ as F |
| Ethylene carbonate ($C_3H_4O_3$) | N/A |
| Other chain carbonate ( - ) | N/A |
| Graphite (C) | 2 mg/$m^3$ as dust |

## Section 12 – Ecological information

The lithium ion cell/battery should be discarded appropriately according to the appropriate regulations.

The cell/battery contains recyclable lithium cobalt oxide (LiCoO2) and is highly recommended for recycling.

## Section 13 – Disposal Consideration

Disposal of used batteries should be in accordance with local regulations.

## Section 14 – Transport Information

Shipping Name (UN Number) Lithium ion batteries (UN3480)
Lithium ion batteries packed with equipment (UN3481)
Lithium ion batteries contained in equipment (UN3481)

Hazard Classification Class 9 (Miscellaneous)

Organizations governing the transport of lithium batteries are as follows,

| Area | Method | Organization | Packing Instruction or Special Provision |
|---|---|---|---|
| International | Air | IATA, ICAO | PI 965-967 |
| International | Maritime | IMO | SP 188 |
| U.S.A | Air,Rail, Road, Maritime | DOT | 49CFRSection 173.185 |

Their regulations are based on the UN Recommendations. The UN Recommendations (22nd revised edition) require that lithium ion cells and batteries shall be manufactured under

a quality management program and this requirement is adopted by IMDG Code and ICAO TI/IATA DGR. Since Maxell factories have been certified to ISO 9001, we meet this requirement.
Each packing instruction or special provision provides specifications on exceptions and packaging for lithium ion cells and batteries.
1) Air transportation: In IATA DGR (64th edition), the packing requirements for lithium ion cells and batteries transport are specified in PI 965, for lithium ion cells and batteries packed with equipment in PI 966, and for lithium ion cells and batteries contained in equipment in PI 967.
Maxell prismatic lithium ion cells which have a Watt-hour rating of more than 2.7Wh but not more than 20Wh can be transported according to Section IB (Class 9 Dangerous Goods) of PI 965.
2) Maritime transportation: Maxell prismatic lithium ion cells which have a Watt-hour rating of not more than 20Wh can be transported as “Exemption from Class 9 Dangerous Goods” according to SP 188 of IMDG Code (2022 edition).

**Section 15 – Regulatory Information**

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

- UN (United Nations) Recommendations on the Transport of Dangerous Goods: Model Regulations 22nd revised edition
- UN (United Nations) Recommendations on the Transport of Dangerous Goods: Manual of Test and Criteria
- The International Civil Aviation Organization (ICAO): Technical Instructions for Safety Transport of Dangerous Goods by Air, 2023-2024 edition
- The International Air Transport Association (IATA): Dangerous Goods Regulations, 64th edition
- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2022 edition

**Section 16 – Other Information**

For further information, please contact a Maxell sales representative.