

Safety Data Sheet

Maxell lithium ion cells are exempt articles and are not subject to the U.S Department of Labor OSHA Hazard Communication Standard (HCS) 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.

Maxell makes no warranty as to their accuracy, completeness or otherwise, expressed or implied.

Section 1 - Product and Company Identification

Product Name Lithium ion cells (HR,AHR,AQR,AQS,TR_No.Si)	TEL: (+81)-(0)75-956-4161
Manufacturer's Name Maxell , Ltd .Energy Div.	FAX: (+81)-(0)75-956-4163
Address 1Koizumi,Oyamazaki,Oyamazaki-cho, Otokuni-gun,kyoto,618-8525 Japan	

Section 2 – Composition / Information on Ingredients

Components	CAS#	Content (wt%)
Lithium cobalt dioxide (LiCoO ₂) + Lithium Nickel Cobalt Complex Dioxide	12190-79-3, 193214-24-3	less than 41wt% (less than 5wt% as Ni oxide)
Electrolyte (-)	21324-40-3, 96-49-1 and others	less than 16wt%
Graphite (C)	7782-42-5	less than 20wt%
Aluminum (Al)	7429-90-5	less than 22wt%
Copper, Nickel metal and inert materials	7440-50-8 and others	Remainder
Lead (Pb)*	7439-92-1	less than 0.004wt%(40ppm)
Mercury (Hg)*	7439-97-6	less than 0.0005wt%(5ppm)
Cadmium (Cd) *	7440-43-9	less than 0.0020wt%(20ppm)

* Banned or restricted material.

Section 3 – Hazards Identification Including Emergency Overview

A lithium ion cell is normally stable under appropriate handling and storage conditions.

If a lithium ion cell generates abnormal heat, keep away from the cell to avoid inhaling internal materials. Chemicals utilized in lithium ion cells do have some toxicity and inhalation may cause irritation.

Section 4 - First Aid Measures

In case of contact with released electrolyte, immediately flush eyes or skin with plenty of water for at least 15 minutes, and remove contaminated clothes and shoes. To avoid inhaling internal materials, leave the area immediately. If irritation persists, consult a physician immediately.

Section 5 - Fire Fighting Measures

Extinguishing media: Plenty of water, water fog spray, dry chemical powder or carbon dioxide

Flammable limits: N/A

Section 6 - Accidental Release Measures

Steps to be taken in case material is released or spilled: Leave the contaminated area. In case of contact with electrolyte, wash out electrolyte with plenty of water for at least 15 minutes. If irritation persists, consult a physician immediately.

After cooling, remove spilled electrolyte and batteries with absorbent and avoid making contact with the electrolyte.

Section 7 - Handling and Storage

Handling:

The risk of heat, fire, explosion:

- Do not dip or wet the cell or battery in water.
- Do not put the cell or battery into a fire or heat it. Do not solder the cell directly. Do not use or leave the cell or battery in a place near fire or heaters.
- Do not disassemble. Do not apply heavy impact to the cell or battery.
- Do not connect the cell or battery reversed in positive (+) and negative (-) terminals in the charger or equipment.
- Do not use any battery charger not specified by the manufacturer and be sure to follow the charge conditions specified by the manufacturer.
- Do not connect the battery directly to an electric outlet or cigarette socket in a car.

Storage:

- Store in a cool place (preferably below 30°C/86°F) 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: Not necessary under normal use.

Hand protection: Not necessary under normal use.

Eye protection: Not necessary under normal use.

Skin protection: Not necessary under normal use.

Ventilation: Not necessary under normal use.

Other protective wear or equipment: Not necessary under normal use.

Section 9 – Physical/Chemical Characteristics

Melting point (°C): LiCoO₂ (about 1100°C), ethylene carbonate (38°C), chain carbonate (< 0°C)

Boiling point (°C): Ethylene carbonate (240°C), chain carbonate (100-130°C)

Flash point (°C): Ethylene carbonate (151°C), chain carbonate (21-33°C)

Specific gravity: LiCoO₂ (5g/cm³), LiNiO₂ (4.9g/cm³), graphite (2.1g/cm³)

Appearance: LiCoO₂, LiNiO₂ and graphite are black powder.

Section 10 - Stability and Reactivity

Stability: Product is stable under storage conditions described in section 7.

Conditions to avoid: Do not heat above 100°C (212°F, incinerate, or expose contents to water.

Hazardous decomposition or byproducts: N/A

Hazardous polymerization: Will not occur.

Section 11 - Toxicological Information

None unless internal materials are exposed.

In case of exposure, these cells contain the chemicals listed below.

Components	ACGIH
Lithium cobalt dioxide (LiCoO ₂)	0.02mg/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 ₃ H ₄ O ₃)	Not Established
Chain carbonate (-)	Not Established
Graphite (C)	2 mg/m ³ as dust

In case of internal gas released or electrolyte spilled: Electrolyte containing LiPF₆ and organic solvents has a small amount of toxicity and may cause irritation of the skin or eyes. Released gas may also cause irritation of skin or eyes.

Section 12 - Ecological Information

Lithium ion cells and batteries should be disposed of in accordance with appropriate federal,

state and local regulations. However, we recommend recycling, since these cells and batteries contain recyclable material (LiCoO₂).

Section 13 - Disposal Consideration

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation.

Section 14 - Transportation 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	49 CFR Section 173.185

Their regulations are based on the UN Recommendations. The UN Recommendations (20th 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 (60th edition), the packing requirements for lithium ion cells and batteries transport is 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 (2018 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 20th 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, 2019-2020 edition
- The International Air Transport Association (IATA): Dangerous Goods Regulations, 60th edition
- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2018 edition

Section 16 - Other Information

For further information, please contact a Maxell sales representative.