



Hitachi Maxell Energy, Ltd.

Issued date: Apr.01, 2011

No. PBD01105

Product 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 (Cylindrical) (INR18650PB1, INR18650PB2, INR18650PB2G)	TEL: (+81)-(0)75-956-4161
Manufacturer's Name Hitachi Maxell Energy, Ltd. Power Battery Division	FAX: (+81)-(0)75-956-4163
Address 1, Koizumi, Oyamazaki, Otokuni, Kyoto, 618-8525, Japan	

Section 2 - Composition / Information on Ingredients

Components	CAS#	Content (wt%)
Lithium Nickel Cobalt Complex Dioxide	193214-24-3	less than 20wt%
Lithium Manganese Dioxide (LiMn ₂ O ₄)	12057-17-9	less than 10wt%
Lithium Hexafluorophosphate (LiPF ₆)	21324-40-38	less than 3wt%
Ethylene Carbonate (C ₃ H ₄ O ₃)	96-49-1	less than 5wt%
Chain Carbonate (-)	-	less than 9wt%
Graphite (C)	7782-42-5	less than 20wt%
Lead (Pb)*		less than 0.004wt%(40ppm)
Cadmium (Cd)*		less than 0.002wt%(20ppm)
Mercury (Hg)*		less than 0.0005wt%(5ppm)

*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, leave 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 from contaminated area. In case of contact with electrolyte, wash out electrolyte with plenty of water 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 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 heater socket in a car.

Storage:

- Store in 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): Lithium Nickel Cobalt Complex Dioxide (Above 1000°C)

LiMn₂O₄(Above 1000°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: Lithium Nickel Cobalt Complex Dioxide (4.7g/cm³)

LiMn₂O₄(4.2g/cm³) , Graphite(2.1g/cm³)

Appearance: Lithium Nickel Cobalt Complex Dioxide, LiMn₂O₄ 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 some chemicals listed below.

Components	ACGIH
Lithium Nickel Cobalt Complex Dioxide	0.02mg/m ³ as Co 0.05mg/ m ³ as Ni
Lithium Manganese Dioxide (LiMn ₂ O ₄)	0.2mg/m ³ as Mn
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

- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2008 edition

Section 16 - Other Information

For further information, please contact a Maxell sales representative.

Section 17 - Applicable Models

INR18650PB1, INR18650PB2, INR18650PB2G