



Material Safety Data Sheet

1. Product & Company Identification

Product:	Rechargeable Coin Type Lithium Manganese Dioxide Battery LIR2477
Manufacturer:	Conrad Electronic SE
Nominal voltage:	3.6 V
Nominal capacity:	200 mAh (0.72 Wh)
Address:	Klaus-Conrad-Str. 1, D-92240 Hirschau
Telephone:	+49 (0) 9604 / 40 - 8988
Date of issue:	03.01.2018

2. 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.

3. Composition/Information on Ingredients

Ingredient	Content (wt%)	CAS number
Lithium Cobalt Oxide (LiCoO ₂)	10-45	12190-79-3
Lithium Hexafluorophosphate (LiPF ₆)	0.5-20	21324-40-3
Ethylene Carbonate (C ₃ H ₄ O ₃)	1-10	96-49-1
Graphite (C)	2-22	7782-42-5
Copper (Cu)	7-13	7440-50-8
Aluminum (Al)	5-11	7429-90-5
PE Separator	1.0-5	90989-93-8
Electrolyte	3-9	N/A
Nickel (Ni)	1.0-3.5	7440-02-0
Other	3-10	N/A



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4. First Aid Measures

None unless internal materials exposure. If contents are leaked out, observe 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.

Eye

Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately.

Ingestion

If swallowing a battery, consult a physician immediately. If contents come into mouth, immediately rinse by plenty of water and consult a physician.

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 (e.g. carbon dioxide)

Fire fighting procedure

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

6. Accidental Release Measures

If the battery releases liquid, wipe it with a dry cloth. Keep the battery away from fire or heat.



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7. Handling and Storage

Handling

Do not swallow. Always keep the battery out of the reach of infants and young children to prevent it from being swallowed. If swallowed, consult a physician immediately.

Do not put the battery in a microwave oven or a pressure cooker. Sudden heat may damage the seal of the battery and may cause overheating, explosion or fire.

Do not use the battery together with a primary battery such as a dry battery or other battery of a different capacity, type and/or brand. In such a case, over-discharge during use or over-charge during charging may occur and abnormal chemical reactions may cause heat generation, explosion or fire from the battery.

Design your equipment so that the end user cannot replace the battery by mistake. If you are an equipment manufacturer and need to replace the battery, please use a new one of the same type and same model as the existing one. Because this is a rechargeable battery, its characteristics are completely different from other primary batteries (e.g. coin type lithium manganese dioxide batteries: CR) or other secondary batteries (e.g. lithium manganese dioxide rechargeable batteries: ML) even though their shapes are alike. If a different battery is installed in the circuit in place of a Li-ion battery, gas could be generated or the primary battery could be short-circuited by charging. This could lead to distortion, leakage, overheating, explosion, or fire.

If you notice any unusual odor, heat, discoloration, deformation or any other characteristic apart from what you are used to while using, charging or storing the battery, then take it out of the equipment or charger, and avoid using it. Using it in such state may result in overheating, explosion or fire.

If the battery leaks or emits an unusual odor, remove it from the vicinity of any fire immediately. The electrolyte may catch fire, which may cause explosion or fire.

Do not let leaked electrolyte come into contact with the eyes. In the event of such contact, flush the eyes with plenty of water immediately and consult a doctor. Otherwise prolonged contact may cause serious injury.

When charging is not finished in the expected period of time, stop charging. Otherwise the battery may cause overheating, explosion or fire.

Storage

Never let the battery contact with water. Never store the battery in hot and high humid place.

Charge the battery every 6 months to the amount specified by the manufacturer, even if the battery is not used.

8. Exposure Controls, Personal Protection

Respiratory Protection

NA

Ventilation

NA

Eye Protection

NA

Protective Gloves

NA

Other protective clothing

NA



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9. Physical and Chemical Properties

The appearance is a coin shape and it is a rechargeable cell with 3.6V nominal voltage.

10. Stability and Reactivity

Stability

Stable (Performance deterioration depends on circumstance)

Incompatibility

Water

Hazardous polymerization

Will not occur

Condition to avoid

See section 7, Do not heat above 100 °C (212°F)

Hazardous Decomposition or Byproducts

Hydrogen (By moisture)

11. Toxicological Information

As the contents are sealed in the battery case, there is no toxicity.

12. Ecological Information

If the battery is disposed of on land or in water, the battery case may corrode and liquid leak from the battery.

Ecological information has not been reported.

13. Disposal Considerations

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.



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14. Transportation Information

Shipping Name (UN Number)

Lithium ion button batteries (UN3480)

Lithium ion button batteries packed with equipment (UN3481)

Lithium ion button 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	PI965: Lithium ion button Batteries (Including lithium ion polymer batteries) PI966: Lithium ion button Batteries packed with equipment (Including lithium ion polymer batteries) PI967: Lithium ion button Batteries contained in equipment (Including lithium ion polymer batteries)
International	Maritime	IMO	SP188
USA	Air, Rail, Road, Maritime	DOT	DOT 49 CFR Section 173.185

Their regulations are based on the UN Recommendations. The UN Recommendations 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.

Each packing instruction or special provision provides specifications on exceptions and packaging for lithium ion cells and batteries.

1) Air transportation: In IATA DGR (58th 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. The coin type lithium ion cell can be transported according to Section II (Exemption from Class 9 Dangerous Goods) of PI 965.

Lithium ion cells and batteries, UN 3480, Packaging Instruction 965 only, are forbidden for carriage as cargo on passenger aircraft.

UN 3480, PI 965, Section IA and 18. Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity. Cells and/or batteries at a SoC of greater than 30% may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.

UN 3480, PI 965, Section II. Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.

2) Maritime transportation: The coin type lithium ion cell can be transported as "Exemption from Class 9 Dangerous Goods" according to SP 188 of IMDG Code.

As the related district, country or airline may establish their special requirements, the shipper shall confirm them with the forwarder in advance.



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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 19th 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, 2017-2018 edition

The International Air Transport Association (IATA): Dangerous Goods Regulations, 58th edition

International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2016 edition

Major environmental regulations are as follows:

EU BATTERY DIRECTIVE 2013/56/EU

16. Other Information

If you want further information, please contact us.