

*Material Safety Data Sheet*

# MSDS Report

<b>Prepared For:</b>	LiB energy
<b>Address:</b>	Smart Innovation Hub, Keele Science & Innovation Park, Keele University - ST5 5BG, United Kingdom
<b>Product Name:</b>	Rechargeable Li-ion Battery
<b>Model :</b>	LiB 12.8V 24Ah
<b>Nominal Voltage:</b>	12.8V
<b>Rated Capacity:</b>	24Ah, 307.2Wh
<b>Weight:</b>	Approx. 3.7 kg
<b>Dimension :</b>	178mm(L)×168mm(W)×128mm(H)
<b>Report No.:</b>	LiB20230312

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Inspected by:	Torsten Hagge	Issue date:	2023-03-29

## Material Safety Data Sheet

### Section 1 - Chemical Product and Company Identification

<i>Product Name:</i>	Rechargeable Li-ion Battery
<i>Product Model:</i>	LiB 12.8V 24Ah
<i>Manufacture:</i>	LiB energy
<i>Address:</i>	Smart Innovation Hub, Keele Science & Innovation Park, Keele University - ST5 5BG, United Kingdom
<i>Tel:</i>	+49 (0) 4022 634 81-77
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<i>Emergency Tel:</i>	+49 (0) 4022 634 81-77
<i>E-mail:</i>	info@lib.energy

### Section 2 - Hazards Identification

<i>Classification of Danger</i>	See section 14.
<i>Primary Route(s) of Exposure</i>	Eye, skin contact, ingestion.
<i>Health Hazard</i>	The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

### Section 3 – Composition/Information on Ingredients

<b>Chemical Composition</b>	<b>CAS No.</b>	<b>Concentration or concentration ranges (%)</b>
Lithium iron phosphate	156-21-8	29.87%
Carbon nanotubes	1333-86-4	0.62%
Charcoal	16291-96-6	0.30%
poly(vinylidene fluoride)	24937-79-9	0.95%

Graphite	7782-42-5	13.92%
Styrene, 1.3-butadiene polymer	9003-55-8	0.60%
Carboxymethylcellulose sodium	9004-32-4	0.19%
aluminium	7429-90-5	4.30%
Copper	7440-50-8	9.43%
polypropylene	9003-07-0	2.70%
Ethylene carbonate	96-49-1	4.03%
Dimethyl carbonate	616-38-6	6.72%
Methyl ethyl carbonate	623-53-0	2.69%
lithium hexafluorophosphate	21324-40-3	1.92%
Iron	12597-68-1	18.14%
Nickel	7740-02-0	0.15%
poly(ethylene terephthalate)	25038-59-9	3.49%
Lead	7439-92-1	Not Detected
Cadmium	7440-43-9	Not Detected
Mercury	7439-97-6	Not Detected

Labeling according to EC directives.

No symbol and risk phrase are required.

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

## Section 4 - First Aid Measures

<i>Eye</i>	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
<i>Skin</i>	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
<i>Inhalation</i>	Remove from exposure and move to fresh air immediately. Use oxygen if available.
<i>Ingestion</i>	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

## Section 5 - Fire Fighting Measures

<i>Characteristics of Hazard</i>	Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
<i>Hazardous Combustion Products</i>	Carbon dioxide.
<i>Fire-extinguishing Methods and Extinguishing Media</i>	For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
<i>Attention in Fire-extinguishing</i>	Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## Section 6 - Accidental Release Measures

<i>Personal Precautions, protective equipment, and emergency procedures</i>	In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
<i>Environmental Precautions</i>	Prevent product from contaminating soil and from entering sewers or waterways.
<i>Methods and materials for Containment</i>	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
<i>Methods and materials for cleaning up</i>	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

## Section 7 - Handling and Storage

<i>Handling</i>	In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.
<i>Storage</i>	Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
<i>Other Precautions</i>	The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

## Section 8 - Exposure Controls/Personal Protection

<i>Engineering Controls</i>	Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m <sup>3</sup> respirable fraction (10mg/m <sup>3</sup> total) should be observed.
<i>Personal Protective Equipment</i>	Eye and Face Protection: None required for consumer use. If there is a risk of contact: Tight sealing safety goggles. Face protection shield. Skin and Body Protection: None required for consumer use. If there is a risk of contact: Wear protective gloves and protective clothing. Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

## Section 9 - Physical and Chemical Properties

<i>Physical State</i>	Appearance:
	Color:
	Odour: If leaking, smells of medical ether.
<i>Change in condition</i>	
<i>pH</i>	Not applicable as supplied.
<i>Flash Point</i>	Not applicable unless individual components exposed.
<i>Flammability</i>	Not applicable unless individual components exposed.
<i>Relative density:</i>	Not applicable unless individual components exposed.
<i>Solubility (water)</i>	Not applicable unless individual components exposed.
<i>Solubility (other)</i>	Not applicable unless individual components exposed.

## Section 10 - Stability and Reactivity

<i>Chemical Stability</i>	Stable under recommended storage conditions.
<i>Possibility of Hazardous Reactions</i>	None under normal processing.
<i>Conditions to Avoid</i>	Exposure to air or moisture over prolonged periods.
<i>Incompatible materials</i>	Acids, Oxidizing agents, Bases.
<i>Hazardous Decomposition Products</i>	Carbon oxides.

## Section 11 - Toxicological Information

<i>Irritation</i>	In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
<i>Sensitization</i>	Not Available.
<i>Reproductive Toxicity</i>	Not Available.
<i>Toxicologically Synergistic Materials</i>	Not Available.

## Section 12 - Ecological Information

<i>General note:</i>	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
<i>Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity</i>	Not Available.

## Section 13 - Disposal Considerations

<i>Waste Treatment</i>	Recycle or dispose of in accordance with government, state & local regulations.
<i>Attention for Waste Treatment</i>	Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

## Section 14 - Transport Information

<i>UN number</i>	UN3480 or UN3481
<i>Proper shipping name</i>	Lithium ion batteries (including lithium ion polymer batteries) or Lithium ion batteries packed with equipment (including lithium ion polymer batteries) or Lithium ion batteries contained in equipment (including lithium ion polymer batteries)
<i>Class or division</i>	9
<i>Marine pollutant (Yes/No)</i>	No
<i>Packing group</i>	N/A
<i>Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises</i>	
<i>ICAO / IATA:</i>	Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IB, or (PI) 966 Section II, or (PI) 967 Section II appropriate of IATA DGR 64th (2023 Edition) for transportation.
<i>IMDG CODE:</i>	Can be shipped by sea in accordance with IMDG code 2022 edition (Amdt 41-22) Packing Instruction P903.
In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

## Section 15 - Regulatory Information

- a) Dangerous Goods Regulations
- b) Recommendations on the Transport of Dangerous Goods-Model Regulations
- c) Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
- d) International Air Transport Association (IATA)
- e) International Maritime Dangerous Goods (IMDG)
- f) Technical Instructions for the Safe Transport of Dangerous Goods
- g) Classification and code of dangerous goods (GB 6944-2012)
- h) 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
- i) Toxic Substance Control Act (TSCA)
- j) Code of Federal Regulations
- k) In accordance with all Federal, State and local laws

## Section 16 - Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, we makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

--End of report--