



MATERIAL SAFETY DATA SHEET

Manufacturer: SHENZHEN LC HI-TECH CO., LTD

Document No:

LC-MSDS-010

Revision:

A/4

MATERIAL SAFETY DATA SHEET

Product Name: Lithium-iron Phosphate Rechargeable Cell

Prepared by	Checked by	Approved by
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Issue Date: 2018-01-04

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name:	Li-Ion Cells or Battery Pack
Product description:	Lithium Iron Rechargeable Chemistry
Product Size:	Large Format cylindrical cell (for all sizes)
Product codes:	IFR14430E500 RC, IFR14500E600 RC, IFR14500E570 RD, IFR18650E1500 RD, IFR18500E1000 RD, IFR18650P1200, IFR26600E3000 RD, IFR26650N3000 RD, IFR26650P2500 RD, IFR26650E3000 RC, IFR26650E3200 RD, IFR26650E3400 RC,
Company Address:	1F, 57-2 ROAD, XINTANG, DAKANG, HENGGANG, LONGGANG DISTRICT, SHENZHEN, GUANGDONG
Telephone Number:	86-755- 84260300, Ext 2905
Fax Number:	86-755- 84260306

2. COMPOSITION INFORMATION

Common Chemical Name/General Name	CAS #	Percent of Content (%)	Classification and Hazard labeling
Lithium Iron Phosphate (LiFePO ₄)	15365-14-7	25-35	Eye, skin, respiratory irritant
Carbon, as Graphite	7440-44-0	10-20	Eye, skin, respiratory irritant
Aluminum	7429-90-5	4-9	Inert
Copper	7440-50-8	8-12	Inert
Electrolyte			Mixture: Flammable; reactive; sensitizer; eye;
Ethylene carbonate	96-49-1	12-22	skin & respiratory irritant
Dimethyl carbonate	616-38-6		
Ethyl methyl carbonate	623-53-0		
Lithium hexafluorophosphate	21324-40-3		

3. HAZARDS IDENTIFICATION

Caution

Do not open or disassemble the batteries. Do not expose the batteries to fire or open flame. Do not mix batteries of varying sizes or chemistries. Do not short circuit, puncture, incinerate, crush, over-charge, over discharge, or expose the batteries to



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temperatures above the declared limit. Abuse of the batteries will result in the risk of fire or explosion, which could release hydrogen fluoride gas.

Human Health Hazard:

Electrolyte may irritate skin and eyes. Electrolyte steam has an anesthesia action and irritates the respiratory tract.

4. EMERGENCY AND FIRST AID MEASURES

Inhalation:

If contents of an opened cell are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.

Eye contact:

Contact with the contents of an opened cell can cause burns. If eye contact with contents of an open cell occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.

Skin contact:

Contact with the contents of an opened cell can cause burns. If skin contact with contents of an open cell occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

Inhalation:

Contact with the contents of an opened cell can cause burns. If ingestion of contents of an open cell occurs, NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.



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5. FIRE FIGHTING MEASURES

Flammable Properties:

Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150°C (302°F)), when damaged or abused (e.g., mechanical damage or electrical overcharge). Burning cells can ignite other batteries in close proximity.

Suitable extinguishing Media:

Small Fires-Dry chemical, CO₂, water spray or regular foam. Large Fires-Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.

Unsuitable extinguishing Media: Not Applicable

Explosion Data:

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Sensitivity to Mechanical Impact:

Extreme mechanical abuse will result in rupture of the individual battery cells.

Sensitivity to Static Discharge:

Electrostatic discharges imposed directly on the spilled electrolyte may start combustion.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment as indicated in Section 8.

Environmental Precautions:

Prevent material from contaminating soil and from entering sewers or waterways.

Methods for Containment:

Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.

Methods for Clean-up:

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.



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7. HANDLING AND STORAGE

Handling/Transportation:

Do not open or disassemble the batteries. Do not expose the batteries to fire or store near open flame. Do not mix batteries of varying sizes or chemistries. Do not connect the positive and negative battery terminals with conductive material or throw into fire. Do not heat or solder the batteries. Keep the batteries in plastic or non-conductive trays. Do not expose batteries to direct sun light for a prolonged time. Do not expose cell to temperatures outside the range of -40°C to 80°C .

Storage:

Batteries should be stored in a well ventilated, cool area with sufficient clearance between batteries and walls. Store the batteries in a cool (below 30°C) area and away from moisture. Keep the batteries away from sources of heat, open flames, food and drink. Do not store the batteries above 55°C or below -30°C . Storing at elevated temperatures may reduce the life of batteries. Keep batteries away from strong oxidizers and acids. Elevated temperature storage such as 100°C may result in battery venting flammable liquid and gases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Keep away from heat and open flame. Store in a cool dry place

PERSONAL PROTECTION

Respirator:

Not required during normal operations. SCBA required in the event of a fire

Eye/face protection:

Not required beyond safety practices of employer.

Gloves:

Not required for handling of cells.

Foot protection:

Steel toed shoes recommended for large container handling.



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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid
Appearance:	Cell
PH	N/A
Relative density	N/A
Boiling point	N/A
Melting point	N/A
Viscosity	N/A
Oxidizing property	N/A
Flash point and method (°C)	N/A
Vapor pressure (mm Hg@20°C)	N/A
Vapor density	N/A
Solubility in water	N/A
Water/oil distribution coefficient	Insoluble
Odor type	Odorless
Odor threshold	N/A
Evaporative rate	N/A
Auto ignition temperature (°C)	N/A
Flammability limits (%)	N/A

10. STABILITY AND REACTIVITY

SUITABLE EXTINGUISHING MEDIA

Avoid exposing the cell to fire or temperatures above 80°C. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.

INCOMPATIBLE MATERIALS

Do not immerse in seawater or other high conductivity liquids.

HAZARDOUS DECOMPOSITION PRODUCTS

His material may release toxic fumes if burned or exposed to fire. Breaching of the cell enclosure may lead to generation of hazardous fumes which may include extremely hazardous HF (hydrofluoric acid).



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POSSIBILITY OF HAZARDOUS REACTIONS

Not available.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity Data/Other Toxicity Data/Irritation:	Acute oral, dermal and inhalation toxicity data are not available for this article. Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Corrosivity:	Not applicable
Sensitization:	Not applicable
Neurological Effects:	Not applicable
Genetic Effects:	Not applicable
Reproductive Effects:	Not applicable
Developmental Effects:	Not applicable
Target Organ Effects:	Not applicable
Carcinogenicity:	Normal safe handling of this product will not result in exposure to substances that are considered human carcinogens by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA or NTP (National Toxicology Program).

This product does not contain mercury, cadmium and Polymer-metal.

Mercury content	N/A
Polymer-metal	N/A
Cadmium content	N/A

12. ECOLOGICAL INFORMATION

Not applicable for this product.



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13. DISPOSAL CONSIDERATIONS

Batteries should be discharged fully prior to disposal. The battery terminals should be capped to prevent a short circuit. Dispose the batteries in accordance with applicable local laws. Li-ion batteries may be subject to federal, state or local regulations.

14. REGULATORY INFORMATION

The transport of rechargeable lithium-ion batteries is regulated by various bodies (IATA, IMO, and ADR, US-DOT) that follow the United Nations "Recommendation on the Transport of Dangerous Goods, Model regulations, 59th revised edition-2009-Ref. STSG/AC.10/11 Rev. 5 A1". Shenzhen LC Hi-Tech co., Ltd products are assigned to UN3480 and are restricted by this regulation.

15. TRANSPORT INFORMATION

Lithium-ion batteries containing no more than 20Wh/cell and 100 Wh /battery pack can be treated as "Non-dangerous goods" under the United Nations Recommendations on the Transport of Dangerous Goods, Special Provision 188, if packaging is strong ,suitable, limited weight ,and prevent the products from short-circuit. Also concerned mark or label should be appeared on each outer box.

With regard to air transport, the following regulations are cited and considered:

- I) The International Civil Aviation Organization (ICAO) Technical Instructions (2017 Edition)
- II) The International Air Transport Association (IATA) Dangerous Goods Regulations (59th Edition), Section II of PI967: lithium-ion batteries contained in equipment.



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Or Section II of PI966: lithium-ion batteries packed with equipment;

Or Section II of PI965: lithium-ion batteries (if >2pcs/carton, it meets Section IB of PI965);

III) The International Maritime Dangerous Goods (IMDG) Code (2016 Edition) with SP188;

IV) The US Hazardous Materials Regulation (HMR) pursuant to a final rule issued by RSPA (Part 49 CFR Sections 100-185),

V) The Office of Hazardous Materials Safety within the US Department of Transportation's (DOT) Research and Special Programs Administration (RSPA),

VI) The UN Recommendations on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria (UN38.3)

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1~T8) on the Transport of Dangerous Goods Model Regulations. It is suitable for ocean transfer and no danger.

Manual of Test and Criteria(38.3 Lithium-ion battery)		
	Test Item	Test Results
T1	Altitude Simulation	Pass
T2	Thermal Test	Pass
T3	Vibration	Pass
T4	Shock	Pass
T5	External Short Circuit	Pass
T6	Impact	Pass
T7	Overcharge	Pass
T8	Forced Discharge	Pass



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16. OTHER INFORMATION

For further information, please contact SHENZHEN LC HI-TECH CO., LTD sales representative.

Contact phone number: 86-0755-84260300;

Note:

This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SHENZHEN LC HI-TECH CO., LTD makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it except normal transport according to the correct transport condition.