

	Lithium Iron Phosphate Chemistry	Date: 05/01/2021
MATERIAL SAFETY DATA SHEET (MSDS)	Rev.	1.3

Section 1. Product And Company Identification

Product name: Li-Ion Cells or Battery Pack

Product description: Lithium Iron Phosphate Chemistry

Product Size: All LiFePO₄ Battery Sizes

Company Name: Arcata Electronics, Inc

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P.R.China Telephone Number: (86 21) 5981 5518

Fax Number: (86 21) 5981 5271

Post Code: 201716

Emergency Telephone Number: Li Jun 013661682440

Section 2. Composition/Information on Ingredients

Common Chemical Name	CAS #	Percent of Content (%)	Classification and Hazard Labelling
Lithium Iron Phosphate (LiFePO ₄)	15365-14-7	30-33	Eye, Skin, Respiratory Irritant
Carbon, as Graphite	7440-44-0	15-17	Eye, Skin, Respiratory Irritant
Aluminum metal	7429-90-5	5-7	Inert
Copper metal	7440-50-8	7-9	Inert
Electrolyte		15-20	Mixture: Flammable; Reactive; Sensitizer; Eye, Skin & Respiratory Irritant
Ethylene carbonate	96-49-1		
Dimethyl carbonate	616-38-6		
Ethyl methyl carbonate	623-53-0		
Lithium Hexafluorophosphate	21324-40-3		

Section 3. Hazardous Identification

Lithium Ion batteries described in this MSDS data sheet are hermetically sealed and designed to withstand temperatures and pressures encountered during normal use. Under normal conditions of use, there is no physical danger of ignition, explosion or chemical danger of hazardous materials leakage. The materials contained in this battery may only represent a hazard if the integrity of the battery is compromised or if the battery is mechanically, thermally or electrically abused.

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, chemistries, or types. Do not short circuit, puncture, incinerate, crush, over-charge, over discharge, or expose the batteries to temperatures above the declared limit. Abuse of the batteries will result in the risk of fire or explosion, which could release hydrogen fluoride gas.

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Human Health Hazard: Electrolyte may irritate skin and eyes. In the event of a battery rupture, electrolyte fumes/gases can cause serious damage to the eye and can cause sensitization and irritation to the respiratory tract.

Section 4. First Aid Measures

General: In an event of battery fire or rupture, evacuate personnel from the contaminated area.

Eye contact: Flush with plenty of water for at least 15 minutes (eyelids held open). Seek medical attention immediately.

Inhalation: Leave area immediately. Seek medical attention immediately.

Skin contact: Remove contaminated clothing. Wash the area with soap and plenty of water immediately and for at least 15 minutes. Seek medical attention.

Ingestion: Drink plenty of water and induce vomiting. Seek medical attention immediately.

Section 5. Fire Fighting Measures:

Extinguishing Media: Plenty of water, Carbon dioxide gas, Chemical powder, fire extinguishing medium and foam.

Fire Fighting Procedures: Use a positive pressure self-contained breathing apparatus if batteries are involved in fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Hazardous Combustion products: Fire, excessive heat and/or over voltage conditions may produce hazardous decomposition products (i.e. electrolyte fumes and hazardous organic vapors). Vapors may be heavier than air and may travel along the ground or be moved by ventilation to an ignition source.

Section 6. Accidental Release Measures:

Remove all personnel from the area immediately. Wear protective gloves and protective glasses. The spilled solids are to be put into a sealed plastic bag or container and disposed off properly (after cooling if necessary). Any leaked electrolyte should be wiped off with dry cloth and disposed off properly (section 13). Do not inhale the gas and avoid skin contact. Do not bring collected materials close to fire.

Section 7. Handling and Storage:

Handling: 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.

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

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moisture. Keep the batteries away from sources of heat, open flames, food and drink. Do not store the batteries above 55⁰C or below -20⁰C . Storing at elevated temperatures may reduce the life of batteries. Keep batteries away from strong oxidizers and acids. Elevated temperature storage such as 100⁰C may result in battery venting flammable liquid and gases.

Section 8. Exposure Controls/Personal Protection:

No engineering controls are required for normal operation. In case of cell leakage, increase the ventilation and use self contained full-face respiratory equipment.

Common Chemical Name/General Name	OSHA PEL-TWA	ACGIH (2010) TLV-TWA
Lithium Iron Phosphate	10.0 mg/m ³ (as iron fume)	5.0 mg/m ³ (as iron fume)
Carbon, As Graphite	5.0 mg/m ³ (respirable fraction)	2.0 mg/m ³ (respirable fraction)
Electrolyte	Not Established	Not Established

OSHA: Occupational Safety and Health Administration

PEL-TWA: Permissible Exposure Limits-Time Weighted Average Concentration

ACGIH: American Council of Government Industrial Hygienists

TLV-TWA: Threshold Limit Value-Time Weighted Average Concentration

Personal Protective Equipment

Not required during normal use of the battery

In the event of a ruptured battery or fire

Respiratory Protection: Self-contained full-face respiratory equipment.

Hand Protection: Chemical protective gloves.

Eye protection: Self-contained full-face respiratory equipment.

Skin and body protection: Chemical-protective clothing.

Section 9. Physical and Chemical Properties:

Appearance: Green/Blue plastic cases with or without ribs hermetically sealed and fitted with metallic terminals/connections.

Odor: No odor

pH: NA

Flash Point: NA

Explosion properties: NA

Density: NA

Solubility with indication of Solvent(s): Insoluble in water



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Section 10. Stability and Reactivity:

Stability: Stable under normal conditions.

Reactivity: When a battery is exposed to high temperatures, crushes, deformation, and external short circuit may result in venting harmful gases and volatile organics. In the event of rupture, hydrogen fluoride gas is produced in reaction with water.

Section 11. Toxicological Information:

There is no available data for the product itself. The information for the internal cell materials are as follows:

Irritancy: The electrolytes contained in the battery can irritate eyes with any contact. Prolonged contact with skin or mucus membrane may cause irritation.

Sensitization: The nervous system of respiratory organs may be stimulated sensitively.

Carcinogenicity: No information is available at this time.

Reproductive toxicity: No information is available at this time.

Teratogenicity: No information is available at this time.

Mutagenicity: No information is available at this time.

Section 12. Ecological Information:

Not applicable for this product.

Section 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.

Section 14. Transportation information:

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. The container must be handled carefully. Prevent the collapse of the cargo piles and wetting by rain. Please refer to section 7 for handling and storage instruction.

UN classification: Arcata Electronics, Inc products' shipping name is "Lithium ion batteries".

According to PACKING INSTRUCTION 965-967 of IATA DGR 62th Edition for transportation, the special provision 188 of MDG(inc Amdt 39-18). The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are integrate and tighten closed before transport Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles. Dont put the goods together with oxidizer and chief food chemicals .The transport vehicle and ship should be cleaned and sterilized before transport. Dunning transport, the vehicle should prevent exposure, rain and high temperature. For stopovers, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road.

Transportation, the driver should drive in accordance with regulated route, don't stop over in he residential area and congested area.

(a) UN numbe

3480&3481

(b) UN Proper shipping name

LITHIUM ION BATTERIES (including lithium ion polymer batteries) or: LITHIUM ION BATTERIES CONTAINED IN EQUIPMEN or LITHIUM ION BATTERIES PACKED

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(c)Transport hazard class(es)

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(d Packing Instruction (if applicable)

965 II/IB,966 II.967 II

(e) Marine pollutant (Yes/No)

No

Section 15. Regulatory information:

The transport of rechargeable lithium-ion batteries is regulated by various bodies (IATA, IMO, ADR, US-DOT) that follow the United Nations "Recommendation on the Transport of Dangerous Goods, Model regulations, 62th Revised edition-2021-Ref. STSG/AC.10/1 Rev. 60". Arcata Electronics, Inc products are assigned to UN3480 and are restricted by this regulation.

Section 16. Other Information/Disclaimer:

The information contained in this material data sheet has been compiled from sources considered to be dependable and is to the best of the knowledge and belief of International Battery, Inc accurate and reliable as of the date of compilation. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information obtained herein. This information relates to the specific materials designated and may not be valid for such materials used in combination with any other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his particular use.

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