



Ascent Battery Supply, LLC  
1325 Walnut Ridge Drive  
Hartland, WI 53029

## SAFETY DATA SHEET (SDS)

## LITHIUM IRON PHOSPHATE (LiFePO<sub>4</sub>)

The information and recommendations below are believed to be accurate at the date of document preparation. Ascent Battery Supply makes no warranty or merchantability or any other warranty, express or implied, with respect to this information and assumes no liability resulting from its use. This SDS provides guidelines for safe use and handling of product. It does not, and cannot, advise all possible situations. All specific uses of this product must be evaluated by the end user to determine if additional safety precautions should be taken.

The following information is provided as a courtesy to Ascent customers.

### SECTION 1 – IDENTIFICATION

<b>Product Name</b>	Lithium Ion Phosphate Rechargeable Battery
<b>Common Name(s)</b>	Lithium Iron Phosphate (LiFePO <sub>4</sub> )
<b>Synonyms</b>	Lithium Iron Phosphate Battery, LiFePO <sub>4</sub> , LiFePO <sub>4</sub> Battery
<b>DOT Description</b>	Dry Battery
<b>Chemical Name</b>	Lithium Iron Phosphate (LiFePO <sub>4</sub> )
<b>Distributed By</b>	Ascent Battery Supply, LLC
<b>Address</b>	1325 Walnut Ridge Drive, Hartland, WI 53029
<b>Emergency number</b>	CHEMTREC 1-800-424-9300
<b>International Emergency Number</b>	CHEMTREC +1 703-741-5970 (Collect)

### SECTION 2 – HAZARD(S)

Hazard Statements	
<b>Intact Batteries</b>	No specific health hazard. If battery exhibits signs of leaking avoid contact without proper protection.
<b>Eyes</b>	Severe irritation or chemical burns if contact with internal material.
<b>Skin</b>	Severe irritation or chemical burns if contact with internal material.
<b>Inhalation</b>	Irritation of respiratory system if exposed to fumes.
<b>Ingestion</b>	Harmful if swallowed; internal battery chemicals will cause severe chemical burns to mouth, esophagus and GI system.
<b>Acute Effects</b>	Irritation, burns, dizziness, headache.
<b>Chronic Effects</b>	Overexposure may cause reproductive disorder(s) based on tests with laboratory animals. Damage to kidneys, central nervous system, eyes, and reproductive system may also occur.

### SECTION 3 – COMPOSITION

Ingredients	CAS No.	Content by Weight
Lithium Iron Phosphate	349632-76-4	22-48%
Carbon (Graphite)	7782-42-5	14-26%
Poly (vinylidene fluoride)	24937-79-4	0-4%
Ethylene carbonate (EC)	96-49-1	0-1%
Dimethyl carbonate (DMC)	616-38-6	0-1%
Dimethyl ether	115-10-6	0-1%
Lithium hexafluorophosphate	21324-40-3	0-1%
Steel	24937-79-9	0-19%
Cu	7440-50-8	0-13%

Al	7429-90-5	0-3%
ABS	9003-56-9	0-7%

#### SECTION 4 – FIRST AID MEASURES

<b>Inhalation</b>	Remove from exposure and move to fresh air immediately. Rinse mouth and nose with water. Do not use mouth-to-mouth resuscitation. If breathing has ceased, apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. Seek medical attention immediately.
<b>Eyes Contact</b>	Rinse immediately with plenty of water for at least 15-30 minutes, occasionally lifting the upper and lower eyelids. Check for and remove contact lenses, if easily possible. Seek medical attention immediately.
<b>Skin Contact</b>	Flush immediately with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing and shoes before re-use. Seek medical attention immediately.
<b>Ingestion</b>	Do not induce vomiting. If the injured is fully conscious: wash out mouth with water, then give 2-4 cups of milk or water. Do not give anything by mouth to an unconscious person. Seek medical attention immediately.

#### SECTION 5 – FIRE-FIGHTING MEASURES

**Hazardous Properties** – Burning batteries may emit toxic fumes

**Hazardous Combustion Products** - Metallic oxide, Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>)

**Firefighter PPE** - Firefighters should wear fire-fighting suits with self-contained breathing apparatus.

**Extinguisher Media** - Class-D dry chemical powder, sand is suitable; do not use water.

**Extinguishing Methods** - Promptly isolate the scene by removing all persons from the vicinity of the incident. No action should be taken involving personal risk without suitable training. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Move containers from fire area if this can be done without risk. Prevent run-off from entering streams or drinking water supply. Do not re-enter scene until thoroughly ventilated.

#### SECTION 6 – ACCIDENTAL RELEASE MEASURES

**General Information** - See Section 8

**Personal Safety Precautions** - No action should be taken involving personal risk without suitable training. Review Sections 5 and 7 before proceeding with spill clean-up. Use proper PPE as indicated in Section 8. Ventilate area adequately. If electrolyte leaks or spills, do not touch or walk through the spill material.

**Environmental Protection** - In the event of battery rupture, capture all released material in a plastic lined container. Dispose of the container in accordance with local laws and regulations. Do not allow leached substances to seep into the earth or waterways.

**Cleaning/Collecting** - Pack the battery, including all battery materials, as described above. Clean the affected area with water (diluted acetic acid may also be helpful).

## SECTION 7 – HANDLING AND STORAGE

This product should be stored, handled, and used in accordance with all Federal, State, and Local laws and regulations. Eating, drinking, and smoking should be prohibited in areas where this product is handled, stored, or processed. Wash hands, forearms, and face thoroughly after handling this product and before eating, smoking, using the lavatory, and at the end of any work period.

Do not dispose of this product in a fire or furnace. Do not mix this product with other battery types. Do not overcharge. Use effective anti-short circuit measures. Do not connect improperly or short circuit, which may result in overheating, explosion, or leakage of cell contents. Accidental short circuit may cause temperature elevation to the battery as well as shortened battery life. Be sure to avoid a prolonged short circuit, as this can rupture the battery case and cause burns and/or fire. Do not handle near conductive objects, such as coins, metal jewelry, belts or use a metal worktable or any other material that may cause an electrical short circuit. Do not use organic solvents or other chemical cleaners on the battery. Do not disassemble or tear down. Avoid battery contact with water and direct sunlight. Transport this product in a 10-50% charged state.

Store this product in a cool, dry, and clean area. Prevent condensation on the cell and battery terminals. High temperature storage conditions may damage the performance of this product and cause leaking or rusting. Protect this product from physical damage and short circuit risk by loose metal objects near terminals. Keep product away from sparks and other sources of ignition. Do not stack uninsulated batteries on top of each other. Do not store on an electrically conductive surface.

## SECTION 8 – EXPOSURE/PERSONAL PROTECTION

Relevant Exposure Limits			
CAS No.	OSHA (mg/m <sup>3</sup> )	ACGIH (mg/m <sup>3</sup> )	NIOSH (mg/m <sup>3</sup> )
7782-42-5 – Graphite	PEL-TWA 15	None listed	None listed
7440-50-8 – Cu	PEL-TWA 1 (dust)	TLV-TWA 1 (dust)	REL-TWA 1 (dust)
7429-90-5 – Al	PEL-TWA 10 (dust)	TLV-TWA 15 (dust)	REL-TWA 10 (dust)

**PPE: Facilities** - Facilities storing or utilizing this product should be equipped with an eyewash station and safety shower.

**PPE: Eyes** - Under normal use, no protection is required. Safety glasses and face shield should be used in the event of leakage or battery case rupture.

**PPE: Clothing** - Under normal use, no special clothing is required. Gloves, boots, apron or other protective clothing should be used in the event of leakage or battery case rupture.

**PPE: Respiration** - Under normal conditions, no special gear is required. Use appropriate respirator if excessive airborne dust or mist concentrations are present.

## SECTION 9 – PHYSICAL/CHEMICAL PROPERTIES

<b>Boiling Point</b>	NA	<b>Melting Point</b>	NA
<b>Vapor Pressure</b>	NA	<b>Vapor Density</b>	NA
<b>Appearance</b>	Rectangular Battery	<b>Solubility in Water</b>	Insoluble

<b>Physical State</b>	Solid	<b>Odor</b>	Odorless
<b>Relative Density</b>	1.12 g/cc		

## SECTION 10 – STABILITY & REACTIVITY

**Chemical Stability** - Stable under normal conditions.

### INCOMPATIBILITY (MATERIALS TO AVOID) –

Not compatible with conductive materials, water, seawater, strong oxidizers, and acids.

**Hazardous Reaction Conditions:** External short circuit, crushing, high temperature, open flames, incompatible material contact, direct sunlight, and high humidity may cause heat generation and ignition or fire.

**Hazardous Decomposition Products:** Thermal decomposition may produce fumes of metal oxides or harmful gases.

**Hazardous Polymerization:** NA

## SECTION 11 – TOXICOLOGICAL INFORMATION

**Relevant Toxicological Limits:**

CAS No.	RETCS
7782-42-5 – Graphite	MD9659600
96-49-1 – EC	FF9550000
616-38-6 - DMC	FG0450000
7440-50-8 – Cu	GL5325000; GL7440000; GL7590000
7429-90-5 – Al	BD0330000; BD1020000

Acute Toxicity	
LiPF <sub>6</sub>	LD50: >1702 g/kg - ingestion
Ethylene carbonate	LD50: >10000 g/kg – ingestion
	LD50: >3000 mg/kg – contact
Dimethyl carbonate	LD50: >6000 g/kg - ingestion

## SECTION 12 – ECOLOGICAL INFORMATION

Discarded batteries may be harmful to the environment.

## SECTION 13 – DISPOSAL

Dispose of properly and follow all Federal, State and Local recycling laws and regulations.

Refer to chemical waste specialists to determine local hazardous material handling and classification.

Do not incinerate.

## SECTION 14 – TRANSPORT

This product complies with the UN Recommendations on the Transport of Dangerous Goods; IATA Dangerous Goods regulations, and applicable U.S. DOT regulations for the safe transport of Li-Ion Battery.

This product has been tested under the provisions of the UN Manual of Tests and Criteria, Part III, sub-section 38.3 and is classified as a non-dangerous good.

Lithium ion cell/battery = UN3480 with Packing Instructions 965

Lithium ion cell/battery packed with equipment = UN3481 Packing Instructions PI966

Lithium ion cell/battery contained in equipment = UN3481 Packing Instructions PI967

**Land transport:** DOT Code of Federal Regulations (USA)

**Sea transport:** IMDG

**Air transport:** ICAO-TI and IATA-DGR Li-Ion Battery according to NEW PACKING INSTRUCTION 965-967 of IATA DGR

## SECTION 15 – REGULATORY INFORMATION

No additional

## SECTION 16 – OTHER INFORMATION

<b>Document Control No:</b>	SDS20022 – SDS for Ascent Lithium Iron Phosphate (LiFePO <sub>4</sub> )	<b>Revision:</b>	10	<b>Effective Date:</b>	10/05/2018
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