



# Material Safety Data Sheet

## Section 1 - Product Identification

**Product Name:** High Energy Lithium Iron Battery Systems, Phosphate Based  
**Model:** XE-12120, XE-1240, XE-1230 , LE-12007, LE-12030, LE-12050, LE-12100  
**Product Use:** Electrical  
**Chemical Family:** Mixture  
**Synonyms:** LFP Battery, Lithium Iron Phosphate Battery  
**Manufacturer:** : Exodus Stored Energy  
 9204 Linwood Ave. Suite 104  
 Shreveport, La. 71106  
**Phone Number:** 318-603-0024  
**Fax:** 318-603-5440  
**24-Hour Emergency:** 1-844-435-3289

## Section 2 - Composition and Ingredient Information

Common Chemical Name	CAS #	Percent of Content (%)	Classification and Hazard Labelling
Lithium Iron Phosphate (LiFePO <sub>4</sub> )	15365-14-7	25-35	Eye, Skin, Respiratory Irritant
Carbon, as Graphite	7440-44-0	12-18	Eye, Skin, Respiratory Irritant
Aluminum metal	7429-90-5	3-7	Inert
Copper metal	7440-50-8	5-9	Inert
Electrolyte:		12-17	Mixture:
Ethylene carbonate	96-49-1		Flammable; Reactive; Sensitizer;
Dimethyl carbonate	616-38-6		Eye, Skin & Respiratory Irritant
Ethyl methyl carbonate	623-53-0		
Lithium Hexafluorophosphate	21324-40-3		



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Under normal use, this battery is not expected to expose user to hazardous ingredients.

USA: This battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Material Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Canada: This is not a controlled product under WHMIS. This product meets the definition of a "manufactured article" and is not subject to the regulations of the Hazardous Products Act.

### Section 3 - Hazards Identification

**Preparation Hazards and Classification:** Not dangerous with normal use. The materials within the battery may only represent a hazard if the structural integrity of the battery or battery management system is compromised. Do not expose the batteries to fire or open flame. Do not mix batteries of varying sizes, chemistries, or types. Do not incinerate the batteries. Incineration of the batteries will result in the risk of release of hydrogen fluoride gas and exposure to the ingredients contained within or their combustion products could be harmful.

**Appearance, Color, and Odor:** Solid object, no odor.

**Primary Route(s) of Exposure:** Risk of exposure will only occur if the battery cell is mechanically, thermally, or electrically damaged and the enclosure is compromised. If this occurs, exposure to electrolyte solutions contained within the battery cell may occur by inhalation, eye contact, skin contact and ingestion.

#### **Potential Health Effects:**

**Inhalation:** Inhalation of material from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation.

**Ingestion:** Swallowing of material from a sealed battery is not an expected route of exposure. Swallowing mists from a ruptured battery may cause respiratory irritation, chemical burns of the mouth and gastrointestinal tract irritation.

**Skin:** Contact between the battery and skin will not cause any harm. Skin contact with positive and negative terminals of high voltages may cause burns to the skin. Skin contact with a ruptured battery can cause skin irritation.

**Eye:** Eye contact with the contents of a ruptured battery can cause severe irritation to the eye.

**Medical Conditions Aggravated by Exposure:** Medical conditions related to potential exposure modalities may be exacerbated by exposure to the materials.

### Section 4 – First Aid Measures

**Skin Contact:** Remove affected articles of clothing. Wash affected area with lukewarm water for at least 30 minutes. If irritation or pain persists, seek medical attention.

**Eye Contact:** Wash affected eye with lukewarm water for at least 30 minutes. Rinse with saline solution if possible. Seek medical attention.

**Inhalation:** Move victim to fresh air and remove source of contamination from area. Seek medical attention.

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



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**Caution:** In all cases evacuate the contaminated area. If irritation persists, seek medical assistance at once.

### Section 5 - Fire Fighting Measures

**Extinguishing Media:** Water, carbon dioxide, dry chemical powder and foam are most effective means to extinguish a battery fire

**Fire Fighting Procedure:** Put on fully protective gear, including self-contained positive pressure breathing apparatus, goggles, fireproofing jacket and gloves. Caution is advised during application of water because burning particles may be ejected from the fire.

**Unusual Fire and Explosion Hazards:** Exposing an individual battery cell to extreme heat, open flame or over voltage condition without a battery management system may cause a leak, hazardous vapors and hazardous decomposition products. Damaged or opened cells in batteries can result in the release of vapors and potentially dangerous gases that may be heavier than air and could travel along the ground or be moved by ventilation. Do not disassemble battery units.

### Section 6 - Accidental Release Measures

The material contained within the batteries cells is only expelled if the battery is damaged. Evacuate the area. Wear protective clothing and glasses. Use a shovel and cover battery with sand or vermiculite, place in an approved container and dispose in accordance with section 13.

### Section 7 – Handling and Storage

**Handling:** Do not expose battery or cell to extreme temperatures or fire. Do not disassemble, crush or puncture battery. Do not mix batteries of varying types or sizes.

**Storage:** Insulate positive and negative terminals to avoid short circuit and ensure sufficient clearance between batteries and other surfaces.

### Section 8 – Exposure Controls and Personal Protection

**Respiratory Protection:** Not necessary under normal use. In case of battery or cell rupture, use a self contained full face respiratory mask.

**Eye Protection:** Not necessary under normal use. Wear safety goggles if handling a ruptured or leaking battery cell.

**Hand Protection:** Not necessary under normal use. Wear Viton rubber gloves if handling a ruptured or leaking battery cell.

**Skin Protection:** Not necessary under normal use. Wear rubber apron and Viton rubber gloves if handling a ruptured or leaking battery cell.

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



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

### Section 9 – Physical and Chemical Properties

<b>Physical State:</b>	Solid	<b>Odor Type:</b>	Odorless
<b>Appearance:</b>	Battery	<b>Odor Threshold:</b>	Not Applicable
<b>pH:</b>	Not Applicable	<b>Evaporative Rate: (n-Butyl Acetate = 1)</b>	Not Applicable
<b>Relative Density:</b>	Not Applicable	<b>Auto Ignition Temperature (C°):</b>	Not Applicable
<b>Boiling Point:</b>	Not Applicable	<b>Flammability Limits (%):</b>	Not Applicable
<b>Melting Point:</b>	Not Applicable	<b>Vapor Pressure: (mm Hg @ 20 C°)</b>	Not Applicable
<b>Viscosity:</b>	Not Applicable	<b>Vapor Density: (Air = 1)</b>	Not Applicable
<b>Oxidizing Properties:</b>	Not Applicable	<b>Solubility in Water:</b>	Insoluble
<b>Flash Point and Method (C°):</b>	Not Applicable	<b>Water/ Oil distribution coefficient:</b>	Not Applicable

### Section 10 – Stability and Reactivity

**Stability:** Stable

**Conditions to Avoid:** Avoid exposing battery to extremely high temperatures. Do not incinerate, deform, mutilate, crush, pierce, or disassemble.

**Materials to Avoid:** Not Applicable

**Hazardous Decomposition Products:** Combustible vapors may be released if exposed to incineration.

**Possibility of Hazardous Reactions:** Hydrogen fluoride gas may be produced in reaction with incineration.

### Section 11 – Toxicological Information



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**Irritation:** Risk of irritation only occurs if individual battery cells are mechanically, thermally or electrically damaged and the enclosure is compromised.

**Neurological Effects:** No information is available at this time.

**Sensitization:** The nervous system and organs may be sensitized by exposure.

**Teratogenicity:** No information is available at this time.

**Reproductive Toxicity:** No information is available at this time.

**Mutagenicity (Genetic Effects):** No information is available at this time.

**Toxicologically Synergistic Materials:** No information is available at this time.

### Section 12 – Ecological Information

**Bioaccumulative potential:** N/A

**Persistence and degradability:** N/A

**Mobility:** N/A

**Ecotoxicity:** No ecologic impact due to lack of heavy metal composition.

**Other adverse effects:** N/A

### Section 13 – Disposal Considerations

**Waste Disposal Method:** Recycling is encouraged. Discharge batteries fully and cap terminals before disposal. Dispose of in accordance with local, state and federal laws and regulations.

**USA:** Dispose of in accordance with local, state and federal laws and regulations.

**Canada:** Dispose of in accordance with local, state and federal laws and regulations.

**EC:** Dispose of in accordance with relevant EC Directives.

### Section 14 – Transport Information

**Hazardous Classifications:** Based on lithium content:

Small quantities of single lithium ion battery cells are exempted from Class 9. No class 9 marking, specification packaging, or Class 9 labels are required.

Use lithium ion battery labels for transport of lithium ion batteries which are not assigned Class 9.

Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium ion batteries which are assigned Class 9. Refer to relevant transportation documents.

Lithium and lithium ion cells and batteries are regulated in the U.S. in accordance with Part 49 of the Code of Federal Regulations, (49 CFR Sections 105-180) of the U.S. Hazardous Materials Regulations.

### Section 15 – Regulatory Information

#### USA

**TSCA Status:** All ingredients in the product are listed on the TSCA inventory.

**SARA Title III:**



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Sec. 302/304: None  
Sec. 311/312: None  
Sec. 313: None  
CERCLA RQ: None

### **California Prop 65:**

This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

### **Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

**WHMIS Classification:** Not Controlled

**New Substance Notification Regulations:** All ingredients in the product are listed, as required, on Canada's Domestic Substance List.

**NPRI Substances (National Pollutant Release Inventory):** This product does not contain any NPRI chemicals.

### **EC Classification for the Substance/ Preparation:**

**Symbol:** This product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

**Risk Phrases:** None

**Safety Phrases:** S2: Keep out of the reach of children.

### **Section 16 – Other Information**

**Preparation Date:** June 29, 2014  
**Revision Date:** N/A  
**Revision Summary:** N/A  
**Prepared by:** Exodus Stored Energy  
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**Disclaimer:** The information and recommendations set forth are made in good faith and accurate at the date of preparation. Exodus makes no warranty expressed or implied with respect to this information and recommendations and disclaims all liability (including without limitation, all direct, indirect, incidental, punitive or consequential liability) from reliance on it. The information relates to specific materials designated and may not be valid for such materials used in combination with any other materials or in any process. Each party using products and materials must determine the suitability and completeness of this information for their intended use.