



**Section 1 - Identification of the Substance/Preparation and of the Company/Undertaking**

Product Name:	High Power/Energy Lithium Ion Battery Cells, Phosphate Based
Product Codes:	LFP123A, LFP14500P, LFP18650E, LFP18650P, LFP18650P-1350, LFP26650EV, LFP26650P, LFP26650EV-3700, LFP26650P-2850
Product Use:	Energy Storage, Battery Cell and Battery Packs
Chemical Family:	Not Applicable
Synonyms:	LFP Battery, Lithium Iron Phosphate Battery
Manufacturer:	K2 Energy Solutions. 7461 Eastgate Rd., Henderson, NV 89011
Phone Number:	702-478-3590
Fax:	702-558-0180
24-Hour Emergency:	Chemtrec: 800-424-9300

Section 2 – Hazards Identification

Protective Clothing	NFPA Rating (USA)	EC Classification	GHS Hazard Symbol
Not Required with Normal Use		Not Classified as Hazardous	

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 is compromised. 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 or below the declared limit. Damage to the batteries may result in the risk of fire or explosion, which could release dangerous 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: Acute (Short Term): see Section 8 for Exposure Controls and Personal Protection. In the event of disassembly or rupture, the electrolyte contained in the cell is corrosive and may cause burns to skin and eyes.

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 3 - Composition/Information on Ingredients

As manufactured and under normal use, this battery is not expected to expose user to hazardous ingredients.

USA: This item 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 Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This SDS 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.

European Communities (EC): This product is not classified as hazardous according to Regulation (EC) No. 1272/2008. This product contains dangerous ingredients however, there is no expected release during use of the product and there is a barrier preventing exposure of the user and the environment.

Common Chemical Name	CAS #	Percent of Content (%)	Classification and Hazard Labeling
Lithium Iron Phosphate (LiFePO4)	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:			Mixture: Flammable; Reactive; Sensitizer; Eye, Skin & Respiratory Irritant
Ethylene Carbonate	96-49-1	3-5	
Dimethyl Carbonate	616-38-6	3-5	
Ethyl Methyl Carbonate	623-53-0	3-5	
Lithium Hexafluorophosphate	21324-40-3	1-3	
Polypropylene	9003-07-0	2-3	Inert
Mild steel can & cap	N/A	18-22	Inert

Section 4 – First Aid Measures



Skin Contact:

Eye Contact:

Inhalation: Ingestion:

Caution:

Title:

LFP Battery Cell SDS

Contact with internal contents may cause burns. If skin contact with internal contents occurs, remove affected articles of clothing. Wash affected area with lukewarm water for at least 30 minutes. If irritation or pain persists, seek medical attention. Decontaminate affected articles of clothing before reuse or discard.

Contact with internal contents may cause burns. If eye contact with internal contents occurs, wash out affected eye with gentle flowing lukewarm water while holding eyelids open for at least 30 minutes. Rinse with neutral saline solution if possible. Use caution not to rinse contaminated water into the unaffected eye, nose, mouth, or onto the face. Seek medical attention.

If internal contents are inhaled, move victim to fresh air and remove source of contamination from area. Seek medical advice.

If ingestion of internal contents occurs, rinse mouth thoroughly with water. **DO NOT INDUCE VOMITING.** If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration and continue to rinse mouth with water. Seek medical attention immediately.

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

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 battery should not be disassembled or incinerated. 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 or cell is mechanically, thermally or electrically abused and the enclosure is compromised. If this occurs, exposure to electrolyte solutions contained within the battery or 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: Contact between the battery and eye will not cause any harm. Eye contact with the contents of a ruptured battery can cause severe irritation to the eye.

Medical Conditions Aggravated by Exposure: Not Available

Section 4 – First Aid Measures

Skin Contact: 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.

Caution: In all cases 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 breathing apparatus, goggles, fireproofing jacket and gloves.

Unusual Fire and Explosion Hazards: Exposing battery pack or cell to excessive heat, fire or over voltage condition may cause a leak, fire, hazardous vapors and hazardous decomposition products. Damaged or opened cells or batteries can result in rapid heating and the release of flammable vapors.

Section 6 - Accidental Release Measures

The material contained within the batteries or cells is only expelled under abusive conditions. 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.

Storage: Insulate positive and negative terminals to avoid short circuit. Store in a cool and well-ventilated area and avoid direct sunlight. Elevated temperatures can result in reduced battery life.

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 cell or battery pack.

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

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

Section 9 – Physical and Chemical Properties

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

Section 10 – Stability and Reactivity

Stability: Stable

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

Materials to Avoid: Not Applicable

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

Possibility of Hazardous Reactions: Not available.

Section 11 – Toxicological Information

Irritation: Risk of irritation only occurs if cells or batteries are mechanically, thermally or electrically abused and the enclosure is compromised.

Neurological Effects: Not applicable.

Sensitization: Not applicable.

Teratogenicity: Not applicable.

Reproductive Toxicity: Not applicable.

Mutagenicity (Genetic Effects): Not applicable.

Toxicologically Synergistic Materials: Not available

Section 12 – Ecological Information

Bioaccumulative potential: Not available.

Persistence and degradability: Not available.

Mobility: Not available.

Ecotoxicity: Not available.

Other adverse effects: Not available.

Section 13 – Disposal Considerations

Waste Disposal Method: Recycling is encouraged. 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:

Some single lithium ion cells and multi cell battery packs 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:

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 it's amendments.

Risk Phrases: None

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

Section 16 – Other Information

Preparation Date:	May 30, 2010
Revision Date:	March 30, 2021
Revision Summary:	1: Engineering Pre-Release
Prepared by:	K2 Energy Solutions. 7461 Eastgate Rd., Henderson, NV 89011
Phone:	702-478-3590

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