EPOCH BATTERIES

STANDARD SAFETY DATA SHEET (SDS)

Section 1: Product and Company Identification

Chemical Product Identification:

Product Name: Lithium Ion Phosphate Rechargeable Battery

Common Name: Lithium Iron Phosphate (LiFePO4)

Distributed By: Epoch Batteries

Address: 164 Andrew Drive Stockbridge, GA 30281 USA

Phone Number: 1-888-501-1846

Email: support@epochbatteries.com

Product Codes:

48V-30Ah-GC2	B1250B	B12460A-H	C12314A
48V-60Ah-GC2-Kit	B12100BB	B2450A	B48100A
48V-90Ah-GC2-Kit	1250A-ES	B24100A	C12460A
48V-100Ah-GC2-Kit	12105A-H	B3650A	C24230A
48V-120Ah-GC2-Kit	DP12120H	3650A-H	C48100A
48V-150Ah-GC2-Kit	12300A-H	B36100A	BB51105A
48V-160Ah-GC2-Kit	DP12300H	B4850A	BB51160A
48V-180Ah-GC2-Kit	B12460A	SR48100H	BB72105A

Section 2: Hazards Identification

Emergency Overview: This product contains a chemical substance. Safety information is given for exposure to the product as sold. Intended use of the product should not result in exposure to the chemical substance.

This is a battery. In case of rupture, the below hazards exist.

Signal Word: DANGER!

Hazard Statements:

The rechargeable lithium-ion batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer and as long as their integrity is maintained.

Pictograms:

Precautionary Statements:

The rechargeable lithium-ion batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer and as long as their integrity is maintained.

Do not short circuit, puncture, incinerate, crush, immerse in water, force discharge or expose to temperatures above the declared operating temperature range of the product. Under normal conditions of use, the active materials and liquid electrolyte contained in the cells and batteries are not exposed to the outside, provided the battery integrity is maintained and seals remain intact. Risk of exposure only in case of abuse (mechanical, thermal, electrical).

These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact.

Potential Health Effects:	In the event that this cell has been ruptured, the electrolyte solution contained within the cell would be corrosive and can cause burns to skin and eyes.
Inhalation:	Inhalation of materials from a sealed cell is not an expected route of exposure. Vapors or mists from a ruptured cell may cause respiratory irritation.
Ingestion:	Swallowing of materials from a sealed cell is not an expected route of exposure. Swallowing the contents of an open cell can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.
Skin:	Contact between the cell and skin will not cause any harm. Skin contact with contents of an open cell can cause severe irritation or burns to the skin.
Eye:	Contact between the cell and the eye will not cause any harm. Eye contact with contents of an open cell can cause severe irritation or burns to the eye.
Interactions With Other Chemicals:	Immersion in high conductivity liquids may cause corrosion and breaching of the cell enclosure.

Section 3: Composition/Information on Ingredient

As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use.

Classification of Hazardous Ingredients:

USA: This cell 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.

EU: This product is an article according to the REACH Regulation (1907/2006).

Component	CAS No.	Composition
Lithium Iron Phosphate	15365-14-7	25-50%
Carbon	7782-42-5	10-30%
Aluminum	7429-90-5	1-15%
Copper	7440-50-8	1-15%
Electrolyte	n/a	5-15%

Section 4: First Aid Measures

Inhalation: If contents of an opened cell are inhaled, remove the source of contamination or move the 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 the emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto the face. Quickly transport victims 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.

Ingestion: 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 the victim is rapidly losing consciousness, or is unconscious or convulsing. Have the victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have the victim lean forward to reduce risk of aspiration. Have the victim rinse mouth with water again. Quickly transport victims to an emergency care facility.

Section 5: Fire Fighting Measures

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

Unsuitable extinguishing Media: Oxidizing agents, reducing agents, acids or alkalis.

Specific Hazards arising from the Chemical: The interaction of water or water vapor and exposed lithium hexafluorophosphate (Li PF6) may result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolyte may be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and/or toxic gases. Fumes may cause dizziness or suffocation.

Protective Equipment and precautions for firefighters:

Respiratory Protection: Self-contained Breathing Apparatus

Hand Protection: Protective Gloves

Eye Protection: Full Face Breathing Apparatus or Goggles

Body Protection: Protective Uniform.

Section 6: Accidental Release Measure

Use of personal Precautions:	As an immediate precautionary measure, isolate the spill or leak area for at least 25 meters (75 feet) in all directions. Wear adequate personal protective equipment as indicated in Section 8.
Emergency Procedures:	Use of Protective Clothing and protective equipment. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering.
Methods for Containment:	Stop the leak if it is safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Clean-up Procedures:	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.

Section 7: Handling and Storage

Safe Handling:	Do not open, dissemble, crush or burn cells. Do not expose cell to temperatures outside the range of -40°C to 80°C. Eating, drinking, and smoking in work areas is prohibited. Wear personal protective equipment when handling battery packs.
Safe Storage:	Store batteries in a dry location. To minimize any adverse effects on battery performance it is recommended that the cells be kept at room temperature (25°C +/- 5°C). Elevated temperatures can result in shortened cell life. Keep out of reach of children. The storage area should be protected from flooding. Long-term storage areas should be compliant with the appropriate local fire code requirements. Extended, longer-term storage (more than a month) at temperatures outside the recommended range can result in degradation of product lifetime.

Section 8: Exposure Controls/Personal Protection

Exposure Limit Values: Airborne exposures to hazardous substances are not expected when product is used for its intended purpose.

Engineering Controls: Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fume and vapor.

Personal Protective Measures:

Respiratory Protection: Not necessary under normal conditions.

Skin Protection: Not necessary under normal conditions. Wear neoprene or natural rubber gloves if handling an open or leaking cell.

Eye Protection: Not necessary under normal conditions. Wear safety glasses if handling an open or leaking cell.

Other Protective Equipment: Not necessary under normal conditions. Have a safety shower and eye-wash fountain readily available in the immediate work area.

Section 9: Physical and Chemical Properties

Appearance:	Prismatic	**Vapor Pressure (mm Hg @ 20°C):**	Not applicable
Odor:	Odorless	**Vapor Density:**	Not applicable
pH:	Not applicable	**Solubility in Water:**	Insoluble
Boiling Point:	Not applicable	**Water / Oil distribution coefficient:**	Not applicable
Melting Point:	Not applicable	**Relative Density:**	Not available
Viscosity:	Not applicable	**Evaporation Rate:**	Not applicable
Oxidizing Properties:	Not applicable	**Auto Ignition Temperature (°C):**	Not applicable
Flash Point and Method (°C):	Not applicable	**Flammability Limits (%):**	Not applicable

Section 10: Stability and Reactivity

Reactivity: Not considered reactive under normal conditions at ambient temperature.

Chemical Stability:	Sealed and normally functioning power cells are considered stable.
Other:	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. Do not immerse in seawater or other high conductivity liquids. This 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), CO and other VOC's.

Section 11: Toxicological Information

Routes of Exposure:	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.

Symptoms related to the physical, chemical and toxicological characteristics:

Effects of overexposure - acute:	Battery (module) internal components can cause chemical burns to skin and eyes.
Effects of overexposure - chronic:	Repeated exposure to battery (module) internal component (hexafluorophos phate) can cause fluorosis of bones and teeth. Delayed and immediate effects and also chronic effects from short- and long-term exposure: Repeated exposure to battery (module) internal components (hexafluorophosphate) can cause fluorosis of bones and teeth.

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).

Section 12: Ecological Information

Eco toxicity:	No data on Eco toxicity.
Persistence and degradability:	No data on environmental degradation.
Bio accumulative potential:	No data on bio accumulative potential.

Mobility in soil: No data on mobility in soil.

Other adverse effects: Solid cells released into the natural environment will slowly degrade and may release harmful or toxic substances. Cells are not intended to be released into water or on land but should be disposed of or recycled according to local regulations.

Section 13: Disposal Considerations

Do not dispose of fire or submerge in water. Battery disposal regulations vary on national, state/provincial and local bases. Disposal must be conducted in accordance with the applicable laws and regulations. These batteries contain recyclable materials and recycling is encouraged over disposal.

Section 14: Transport Information

Lithium-ion batteries are designed to comply with all applicable shipping regulations as prescribed by industry and legal standards which includes compliance 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 lithium-ion batteries and the International Maritime Dangerous Goods Code (IMDG).

In the US, shipments of lithium-ion cells and batteries are classified as Class 9, UN3480, Packing Group II, by the U.S. Hazardous Materials Regulations (HMR). Packaging, markings and documentation requirements are defined in Title 49 of the Code of Federal Regulations (CFR), Section 173.185. of the U.S. HMR. Excepted cells and batteries are allowed to be transported within the US without Class 9 packaging and markings, but must conform to other requirements as stipulated in Special Provisions 188 and 189 in the 49 CFR Section 173.185 of the U.S. HMR.

The regulations contain very specific packaging, labeling, marking, and documentation requirements. The regulations also require that individuals involved in preparation of dangerous goods for transport be trained on how to properly package, label, mark and prepare shipping documents.

UN Number	3480 / 3481
Proper Shipping Name	Lithium-Ion Batteries
Hazard Classification	Class 9 Miscellaneous
Packing group	N/A

Section 15: Regulatory Information

USA

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

EC Classification for the Substance/Preparation: This product is not classified as hazardous according to Regulation (EC) No. 1272/2008. Keep out of the reach of children.

Section 16: Other information

Preparation Information: January, 2025

Additional Safety:

Modules may only be operated with the designated battery. Do not short circuit or deep discharge. Do not damage or perforate. Do not tear down. Do not heat above the allowed limits. Cells in Lithium-Ion batteries are sealed and are not hazardous as long as use of all manufacturer's instructions are applied. Violation of manufacturer's instructions may lead to a release of ingredients of cells. In case of damage to the cell, corrosive and poisonous liquid can be released. In case of fire, corrosive and poisonous vapors and gasses may be released.

This Product Safety Data Sheet is created by the manufacturer according to the OSHA standard of 29 CFR 1910.1200.
The information and recommendations set forth are made in good faith and believed to be accurate at the date of preparation.