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Lithium Iron Phosphate (LiFePO4) Battery	MATERIAL SAFETY DATA SHEET SDS/MSDS

Section 1: Identification

Product Name: Lithium Iron Phosphate (LiFePO4) Battery

Other Names: LFP Battery

Recommended Use: Power source for electronic devices

Restrictions on Use: Do not disassemble, crush, or expose to high temperatures

Supplier Details:

Name: Tinker & Rasor

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Section 2: Hazard Identification

- **Hazard Classification:**
  - Not classified as hazardous under normal usage.
- **Other Hazards:**
  - Risk of electric shock or fire if mishandled.
  - Exposure to damaged or leaking cells may result in chemical burns.
- **Medical Conditions Generally Aggravated by Exposure:**
  - An acute exposure will not generally aggravate any medical condition.
  - **Inhalation:** The steam of the electrolyte can cause respiratory irritation.
  - **Skin contact:** The steam of the electrolyte can cause skin irritation.
  - **Eye contact:** The steam of the electrolyte can cause eye irritation. Sore and inflammation of the eyes may occur.
- **Carcinogenicity:**
  - NTP: None IARC
  - Monograph: None
  - OSHA Regulated: None

Section 3: Composition/Information on Ingredients

Component	CAS Number	Concentration
Lithium Iron Phosphate	15365-14-7	20-40%
Graphite (Carbon)	7782-42-5	10-20%
Electrolyte (organic)	Mixture	10-20%
Copper (current collector)	7440-50-8	5-10%
Aluminum (current collector)	7429-90-5	5-10%
Steel	7439-89-6	18-25%
PE Separator	909-89-93-8	1.5-2%
Nickel	7440-02-0	1-2%

Section 4: First Aid Measures

- **Inhalation:** Move to fresh air. Use Oxygen if available. Seek medical attention if necessary
- **Skin Contact:** Flush immediately with plenty of water. If irritation persists, get medical advice.
- **Eye Contact:** Rinse with clean water for at least 15 minutes. Seek medical attention.
- **Ingestion:** Do not induce vomiting. Seek medical help immediately.

Section 5: Firefighting Measures

- **Hazardous Combustion Products:** When burned, hazardous products of combustion including fumes of carbon monoxide, carbon dioxide, and fluorine can occur.
- **Extinguishing Media:** Water, carbon dioxide gas, chemical power fire extinguishing medium and fire foam.
- **Basic Fighting Procedures:** Wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- **Unusual Fire & Explosion Hazards:** This material does not represent an unusual fire or explosion hazard.

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Section 6: Accidental Release Measures

- **Release Measures:** The preferred response is to leave the area and allow the batteries to cool and the vapors to dissipate. Provide maximum ventilation.
- **Personal Precautions:** Wear protective gloves and safety goggles. Avoid contact with damaged cells.
- **Environmental Precautions:** Prevent spilled material from entering water sources.
- **Cleanup Methods:** Absorb leaking electrolyte with inert material and dispose of according to local regulations.

Section 7: Handling and Storage

- **Handling:**
  - Do not short circuit or puncture.
  - Avoid mechanical or electrical abuse/damage.
  - Keep away from heat and open flames.
  - Do not install with incorrect polarity
- **Storage:**
  - Store in a cool, dry, and well-ventilated place.
  - Avoid direct sunlight & high temperature
  - Keep out of reach of children.
  - **Incompatible products:** Conductive materials, water, seawater, strong oxidizers and strong acids.
  - **Packing material (recommended, not suitable):** Insulative and tearproof materials are recommended.

Section 8: Exposure Controls/Personal Protection

- **Exposure Limits:** No occupational exposure limits established.
- **Engineering Controls:** Ensure adequate ventilation during charging.
- **Personal Protective Equipment (PPE):**
  - Gloves and safety goggles when handling damaged batteries.
- **Respiratory protection (Specify Type) ：** Not necessary under conditions of normal use.
- **Ventilation**: Not necessary under conditions of normal use.
- **Protective Gloves:** Not necessary under conditions of normal use.
- **Eye protection:** Not necessary under conditions of normal use.
- **Other Protective (Clothing or Equipment):** Not necessary under conditions of normal use.

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Section 9: Physical and Chemical Properties

- **Appearance:** Solid, rectangular
- **Color:** Varies
- **Odor:** Odorless
- **Boiling Point:** Not applicable
- **Melting Point:** Not applicable
- **Flash Point:** Not applicable
- **Solubility:** Insoluble in water

Section 10: Stability and Reactivity

- **Reactivity:** Stable under normal use.
- **Chemical Stability:** Stable under recommended storage conditions.
- **Conditions to Avoid:** When cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will cause heat generation and ignition.
- **Hazardous Decomposition Products:** Acid or harmful gas is emitted during fire.

Section 11: Toxicological Information

- **Signs and Symptoms:** None unless cell ruptures.
- **Route of Entry:** If electrolyte released-Anticipated routes of entry, eye, skin contact and inhalation.
- **Route of Acute Exposure:** Electrolyte vapor is irritating to the pulmonary tract.
- **Effect of chronic Exposure**: Electrolyte vapor in large volumes may cause suffocation and pulmonary oedema
- **Irritancy:** Yes

Section 12: Ecological Information

When properly used and disposed, the Lithium batteries do not present environmental hazard.

- **Ecotoxicity:** Leaking contents may harm aquatic life.
- **Persistence and Degradability:** Components are not biodegradable.
- **Bioaccumulation:** Potential for bioaccumulation is low.

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Section 13: Disposal Considerations

- **Waste Disposal Methods:**
  - Dispose of in accordance with local, state, and federal regulations.
  - DO NOT INCINERATE or subject battery cells to temperatures in excess of 212° F. Such treatment can vaporize the liquid electrolyte causing cell rupture.

Section 14: Transport Information

- **UN Number:**
  - UN3480 (if transported as cells or batteries)
  - UN3481 (if transported securely fixed within a device)
- **Proper Shipping Name:** Lithium-ion Batteries
- **Hazard Class:** Class 9 (Miscellaneous Dangerous Goods)
- **Packing Group:** Not applicable
- **Special Precautions:** Follow regulations for shipping lithium batteries.

Section 15: Regulatory Information

- **Safety Regulations:** Complies with OSHA Hazard Communication Standard.
- **Environmental Regulations:** Subject to proper disposal laws.
- **International Air Transport Association (IATA)** pursuant to Packing Instruction PI965-PI967, Section II
- **International Maritime Dangerous Goods Code (IMDG)** pursuant to Special Provisions A188 and A230.
- **U.S. hazardous materials regulations** pursuant to 49 CFR 173.185 and Special Provision A188.

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SECTION 16: Other Information

Date of Preparation: December 16, 2024

Revision Number: 1

Disclaimer:

Tinker & Rasor provides Safety Data Sheets (SDS) for applicable products in compliance with regulatory requirements. These documents are intended to provide information regarding the safe handling, storage, and use of our products. While Tinker & Rasor strives to ensure the accuracy and completeness of the information contained within the SDS, it is provided "as is" without warranty of any kind, either express or implied.

It is the customer's responsibility to review and comply with all applicable safety, health, and environmental regulations when using our products. Tinker & Rasor assumes no liability for any damages, injuries, or losses resulting from the use of the information contained in the SDS or the products themselves. For the most up-to-date SDS, please contact us directly or visit our website.

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