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**SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**

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**PRODUCT NAME:** LiFePO<sub>4</sub> batteries  
**PRODUCT CODES:** Battery  
**MANUFACTURER:** Powerstreaml  
**ADDRESS:** China

**EMERGENCY PHONE:** 1801-7649060

**CHEMICAL NAME:** Lithium Iron Phosphate  
**CHEMICAL FAMILY:** Lithium Ion  
**CHEMICAL FORMULA:** LiFePO<sub>4</sub>

**PRODUCT USE:** Electrical

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**SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS**

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Chemical composition	Molecular formula	CAS No.	Weight (%)
Lithium Iron Phosphate	LiFePO <sub>4</sub>	15365-14-7	31
Graphite	C	7782-42-5	18
Copper	Cu	7440-50-8	12
Aluminium	Al	7429-90-5	8
Lithium Hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	4
Carbonate	-	-	8
Polypropylene	(C <sub>3</sub> H <sub>6</sub> ) <sub>n</sub>	9003-07-0	19

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**SECTION 3: HAZARDS IDENTIFICATION**

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**HEALT HAZARD (ACUTE AND CHRONIC)**

These chemicals are contained in a sealed can. Risk of exposure only occurs if battery is mechanically, thermally or electrically abused. Contact of electrolyte and extruded lithium with skin and eyes should be avoided.

## **SIGNS/SYMPTOMS OF EXPOSURE**

A shorted lithium battery can cause thermal and chemical burns upon contact with the skin. May be a reproductive hazard.

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## **SECTION 4: FIRST AID MEASURES**

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### **EYES:**

Flush affected eye with lukewarm water for at least 30 minutes. Seek medical attention.

### **SKIN:**

Flush affected area with lukewarm water at least 30 minutes. If irritation or pain persists, seek medical attention.

### **INGESTION:**

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

### **INHALATION:**

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

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## **SECTION 5: FIRE-FIGHTING MEASURES**

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**EXTINGUISHING MEDIA:** Water, dry chemical powder, carbon dioxide (CO<sub>2</sub>) and foam are most effective to extinguish a battery fire.

**FIRE-FIGHTING PROCEDURES:** Wear full protective gear, including self-contained breathing apparatus.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Battery may vent when subjected to excessive heat-exposing, fire or over voltage condition.

**HAZARDOUS COMBUSTION PRODUCTS:** Carbon monoxide, carbon dioxide, lithium oxide fumes.

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## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

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The material contained within the batteries 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.

### **STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**

If the battery material is released, remove personnel from the area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Leave the area and allow the batteries to cool and vapors to dissipate. Avoid skin and eye contact or inhalation of vapors.

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## **SECTION 7: HANDLING AND STORAGE**

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**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. Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subjected to little temperature changes. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

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## **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**RESPIRATION PROTECTION:** Not necessary under conditions of normal use. In case of battery venting or rupture, use a self contained full face respiratory mask.

**EYE PROTECTION:** Not necessary under conditions of normal use. In case of battery rupture or leakage, use safety goggles.

**SKIN/HAND PROTECTION:** Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and Viton rubber gloves.

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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<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

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## SECTION 10: STABILITY AND REACTIVITY

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**STABILITY:** Stable

**CONDITIONS TO AVOID:** Heating, mechanical and electrical abuse.

**HAZARDOUS DECOMPOSITION PRODUCTS:** N/A

**HAZARDOUS POLYMERIZATION:** N/A

**INCOMPATIBILITY (MATERIALS TO AVOID):** If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

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## SECTION 11: TOXICOLOGICAL INFORMATION

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Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibroid lung injury and membrane irritation.

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## SECTION 12: ECOLOGICAL INFORMATION

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

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## **SECTION 13: DISPOSAL CONSIDERATIONS**

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**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.

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## **SECTION 14: TRANSPORT INFORMATION**

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The used battery cells has passed the test UN38.3, according to the report ID: E09153002119D and E09153002119D~1. Tested at Pony Testing International.

### **SHIPPING BY AIR:**

**IATA proper shipping name:** Lithium Ion Batteries

**Hazard Class:** 9

**UN Class:** UN3480

**Packaging group:** II

Watt-hour exceeds the standard, so it belongs to dangerous goods. Cargo only. The goods are packaged according to the packing instructions 965 section I of DGR.

### **SHIPPING BY SEA:**

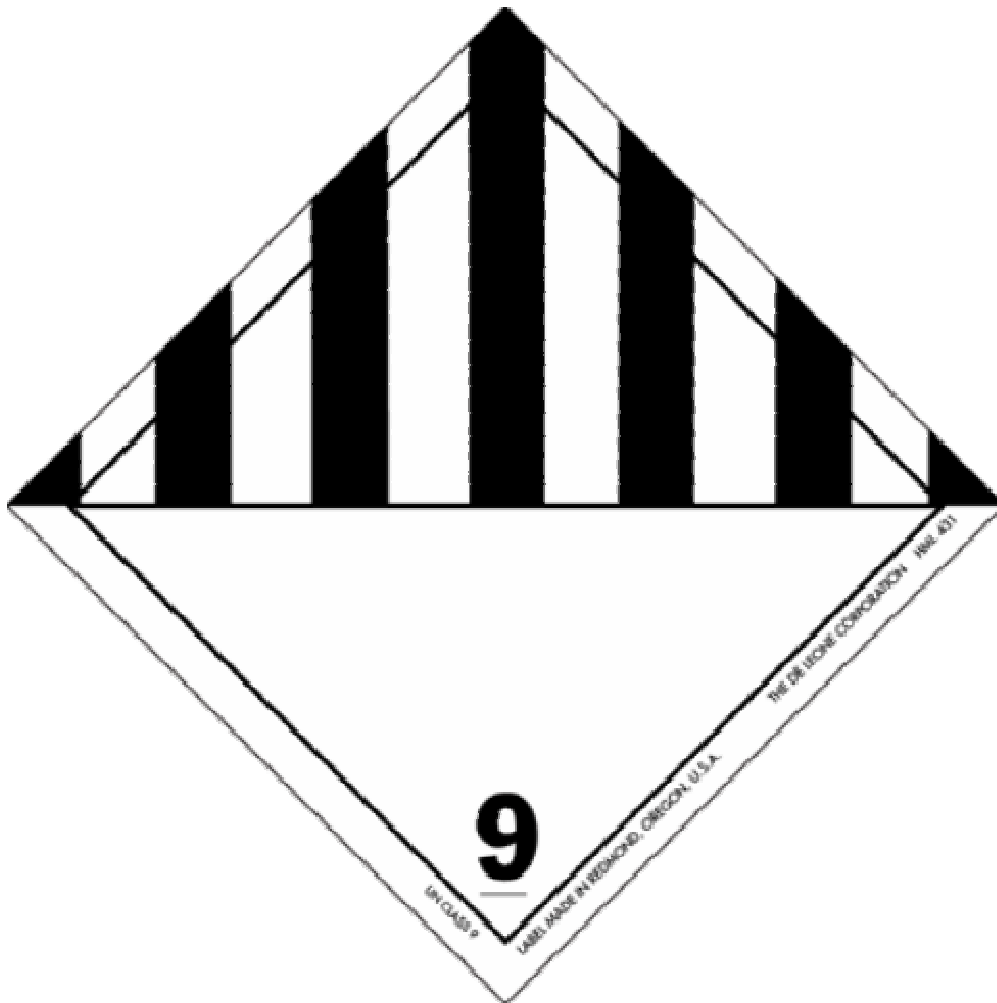
**IMDG proper shipping name:** Lithium Ion Batteries

**Hazard Class:** 9

**UN Class:** UN3480

**Packaging group:** II

Watt-hour exceeds the standard, so it belongs to dangerous goods. The goods are packaged according to the special provision 188 of IMDG.



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.

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## SECTION 15: REGULATORY INFORMATION

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### 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 its amendments.

**Risk Phrases:** None

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

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## **SECTION 16: ADDITIONAL INFORMATION**

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THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, VICTRON BATTERY MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES. ALTHOUGH REASONABLE PRECAUTIONS HAVE BEEN TAKEN IN THE PREPARATION OF THE DATA CONTAINED HEREIN, IT IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THIS MATERIAL SAFETY DATA SHEET PROVIDES GUIDELINES FOR THE SAFE HANDLING AND USE OF THIS PRODUCT; IT DOES NOT AND CANNOT ADVISE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.