

# Safety Data Sheet

Revision Date: 01-JUN-2017

## 1. IDENTIFICATION

**Product Name :** INVICTA Lithium (SNL) battery  
**Product Description:** Lithium Iron Phosphate (LiFePO<sub>4</sub>) rechargeable batteries.  
**Supplier:** Sealed Performance Batteries  
**Address:** SPB National Head Office, 1 Ant Road Yatala, Queensland, 4207, Australia  
**Tel:** (07) 3386 1102  
**Fax:** (07) 3386 1106  
**Emergency Number:** (07) 3306 1102

## 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is a Lithium Iron Phosphate Battery with certified compliance under the UN Manual of Tests and Criteria, Part III, sub-section 38.3. The information below is for repeated and prolonged contact in an occupational setting. It is not likely to apply to normal product use. However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product. Always be aware of the risk of fire, explosion, or burns. Do not short circuit the (+) and (-) terminals with any other metals. Do not disassemble or modify the battery. Do not solder a battery directly. Keep away from fire or open flame.

**Appearance** Battery

**Physical State** Solid

**Odor** None

### Classification

Based on 29 CFR 1910.1200, these products meet the definition of an "article" and they are not subject to the hazards normally associated with the individual components when used as intended.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Composition (in % by weight)	CAS Number
Aluminum (Al)	15-19	7429-90-5
Copper (Cu)	16-20	7440-50-8
LiFePO <sub>4</sub>	28-32	15365-14-7
Graphite(C)	13-17	7782-42-5
lithium	1.6-2.0	21324-40-3
Organic solvents	15-18	N/A

\*\*If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.\*\*

#### 4. FIRST-AID MEASURES

<b>General Advice</b>	Provide this SDS to medical personnel for treatment.
<b>Eye Contact</b>	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes.
<b>Inhalation</b>	Remove to fresh air.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water.

#### Most important symptoms and effects

<b>Symptoms</b>	Based on physical state of the product, accidental exposure is unlikely.
-----------------	--

#### Indication of any immediate medical attention and special treatment needed

<b>Notes to Physician</b>	Treat symptomatically.
---------------------------	------------------------

#### 5. FIRE-FIGHTING MEASURES

#### Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

<b>Small Fire</b>	Carbon Dioxide, Dry Chemical, Foam, Water Fog.
<b>Large Fire</b>	Move containers from fire area if you can do it without risk. Carbon Dioxide, Dry Chemical, Foam, Water Fog.

**Unsuitable Extinguishing Media** Not determined.

#### Specific Hazards Arising from the Chemical

Exposing battery or cell to excessive heat, fire, or over voltage condition may cause flame or leak potentially hazardous organic vapors and produce hazardous decomposition products. Damaged or opened cells and batteries can result in rapid heating and the release of flammable vapors.

**Hazardous Combustion Products** Fire will produce irritating, corrosive and/or toxic gases.

#### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

#### 6. ACCIDENTAL RELEASE MEASURES

#### Personal precautions, protective equipment and emergency procedures

<b>Personal Precautions</b>	Use personal protective equipment as required.
<b>Other Information</b>	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
<b>For Emergency Responders</b>	Keep unnecessary and unprotected personnel from entering.
<b>Environmental Precautions</b>	See Section 12 for additional Ecological Information.

**Methods and material for containment and cleaning up**

<b>Methods for Containment</b>	Prevent further leakage or spillage if safe to do so. Do not release runoff from fire control methods to sewers or waterways.
<b>Methods for Clean-Up</b>	Ground and bond containers when transferring material. Sweep up and shovel into suitable containers for disposal. For waste disposal, see section 13 of the SDS.

**7. HANDLING AND STORAGE**

**Precautions for safe handling**

<b>Advice on Safe Handling</b>	<p>CHARGING/DISCHARGING: Cells and batteries are designed to be rechargeable. However, abnormal charging may cause batteries to flame, and abnormal discharging may result in damaging batteries. Use approved chargers and procedure only.</p> <p>BATTERY DISASSEMBLE: Do not disassemble a battery in any case. If a battery was unintentionally crushed or damaged, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of vapors that may be omitted.</p> <p>BATTERY SHORT CIRCUIT: The battery is an energy source that converts electric power into the chemical form of energy. Therefore, short circuiting the battery may cause the chemical reaction to occur too intensively and provide an ignition source.</p> <p>MIXED BATTERIES AND TYPES: Do not assemble batteries with series or parallel connection. The use of old and new cells of varying capacity or different electrochemical battery systems should be avoided.</p>
--------------------------------	---

**Conditions for safe storage, including any incompatibilities**

<b>Storage Conditions</b>	Fix positive and negative terminals properly to avoid short circuit. Store in cold and well-ventilated area preventing exposure from direct sunlight and other sources of heat. Elevated temperatures can result in reduced battery service life.
<b>Incompatible Materials</b>	None known based on information supplied.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

<b><u>Exposure Guidelines</u></b>	This product presents no health hazards to the user when used according to label directions for its intended purposes
-----------------------------------	---

**Appropriate engineering controls**

<b>Engineering Controls</b>	Apply technical measures to comply with the occupational exposure limits.
-----------------------------	---

**Individual protection measures, such as personal protective equipment**

<b>Eye/Face Protection</b>	Refer to 29 CFR 1910.133 for eye and face protection regulations.
<b>Skin and Body Protection</b>	Refer to 29 CFR 1910.138 for appropriate skin and body protection.
<b>Respiratory Protection</b>	Refer to 29 CFR 1910.134 for respiratory protection requirements.
<b>General Hygiene Considerations</b>	Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties**

<b>Physical State</b>	Solid	<b>Odor</b>	None
<b>Appearance</b>	Battery	<b>Odor Threshold</b>	No odor
<b>Color</b>	Typical		

<b><u>Property</u></b>	<b><u>Values</u></b>	<b><u>Remarks • Method</u></b>
<b>pH</b>	Not determined	
<b>Melting Point/Freezing Point</b>	Not determined	
<b>Boiling Point/Boiling Range</b>	Not determined	
<b>Flash Point</b>	Not determined	
<b>Evaporation Rate</b>	Not determined	
<b>Flammability (Solid, Gas)</b>	Not determined	
<b>Upper Flammability Limits</b>	Not determined	
<b>Lower Flammability Limit</b>	Not determined	
<b>Vapor Pressure</b>	Not determined	
<b>Vapor Density</b>	Not determined	
<b>Specific Gravity</b>	Not determined	
<b>Water Solubility</b>	Not determined	
<b>Solubility in other solvents</b>	Not determined	
<b>Partition Coefficient</b>	Not determined	
<b>Auto-ignition Temperature</b>	Not determined	
<b>Decomposition Temperature</b>	Not determined	
<b>Kinematic Viscosity</b>	Not determined	
<b>Dynamic Viscosity</b>	Not determined	
<b>Explosive Properties</b>	Not determined	
<b>Oxidizing Properties</b>	Not determined	

**10. STABILITY AND REACTIVITY****Reactivity**

If battery assembly is damaged, contents may release flammable vapors.

**Chemical Stability**

Stable under recommended storage conditions.

**Possibility of Hazardous Reactions**

If battery assembly is damaged, contents may release flammable vapors.

**Hazardous Polymerization**      Hazardous polymerization does not occur.

**Conditions to Avoid**

Keep away from heat, sparks and open flame.

**Incompatible Materials**

None known based on information supplied.

**Hazardous Decomposition Products**

Fire will produce irritating, corrosive and/or toxic gases.

**11. TOXICOLOGICAL INFORMATION****Information on likely routes of exposure**

<b>Product Information</b>	Under normal conditions of intended use, this material does not pose a risk to health
<b>Eye Contact</b>	Avoid contact with eyes.

<b>Skin Contact</b>	Avoid contact with skin.
<b>Inhalation</b>	Avoid breathing vapors or mists.
<b>Ingestion</b>	Do not taste or swallow.

**Information on physical, chemical and toxicological effects**

<b>Symptoms</b>	Please see section 4 of this SDS for symptoms.
-----------------	--

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Carcinogenicity</b>	Based on the information provided, this product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.
------------------------	---

**Numerical measures of toxicity**

Not determined

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence/Degradability**

Not determined.

**Bioaccumulation**

Not determined.

**Mobility**

Not determined

**Other Adverse Effects**

Not determined

**13. DISPOSAL CONSIDERATIONS**

**Waste Treatment Methods**

<b>Disposal of Wastes</b>	Lithium iron phosphate as a battery chemistry uses no heavy metals during the manufacturing and is to be considered non-toxic and is approved for landfill disposal. If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amount of uncreated, or unconsumed lithium remaining in the spent battery. The batteries must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste. Recycling of battery can be done in authorized facility, through licensed waste carrier.
<b>Contaminated Packaging</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.

**14. TRANSPORT INFORMATION**

INVICTA Lithium 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. This battery has passed the UN Manual of Tests and Criteria Part III Subsection 38.3, which is required by all of the directives listed above.

International shipments of INVICTA lithium phosphate batteries are classified as Class 9, UN3480, Packing Group II, by the International Civil Aviation Organization (ICAO) and the International Maritime Dangerous Goods (IMDG) Code. Packaging, markings and documentation requirements are defined in the International Air Transport Association (IATA) Dangerous Goods Regulations (DGR) Packing Instructions 965 and Packing Instruction P903 of the IMDG Code.

Shipments of lithium iron phosphate 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.

- (A) This consignment is packed in a clean, good and strong outer packaging.
- (B) This consignment does not contain any recalled and/or defective batteries.
- (C) This consignment have been packed in compliance with Section II of PI965.
- (D) Handle with care, Flammability hazard exists if the package is damaged.
- (E) If package is damaged, batteries must be protected so as to prevent short circuit.

Batteries are completely enclosed by inner packaging so as to prevent from short circuit

**15. REGULATORY INFORMATION**

This Material Safety Data Sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Safety, health and environmental regulations/legislation specific for the substance or mixture

Composition	CAS#	TSCA	EC#	EINECS
Ferrous Phosphate Lithium	15365-14-7	Listed	/	Not Listed
Lithium Hexafluorophosphate	21324-40-3	Listed	244-334-7	Listed
Graphite	7782-42-5	Listed	231-955-3	Listed
Aluminum	7429-90-5	Listed	231-072-3	Listed
Copper	7440-50-8	Listed	231-159-6	Listed

**16. OTHER INFORMATION****NFPA****Health Hazards**

Not determined

**Flammability**

Not determined

**Instability**

Not determined

**Special Hazards**

Not determined

**HMS****Health Hazards**

Not determined

**Flammability**

Not determined

**Physical Hazards**

Not determined

**Personal Protection**

Not determined

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**