

## **MSDS – MATERIAL SAFETY DATA SHEET**

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### **Section 1. Product and Company Identification**

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#### **Product**

**Product Name:**

Aliant Lithium-Iron Phosphate Battery

Models: Aliant

ALIANNT EA100 / EA085 / EA065 / EA045 / EA020 / EA018 / E2 / E3 / 24EA020 / 24EA050 / 48EA045

Synonyms: Lithium battery, high energy Lithium battery, Phosphate battery, Lithium ion Battery

**System:**

Rechargeable Lithium-ion Battery

#### **Company**

**Company Name:**

ELSA Solutions srl

via Patarini 15, 40026 IMOLA (BO) ITALY

Company Phone Number: +39 0542 64 00 92

Emergency Telephone Number: +39 02 66 10 10 29 CAV Niguarda Hospital, Milano, ITALY

#### **Chemistry**

**Chemical Name:**

Lithium Iron Phosphate

Chemical family: Lithium ion

Chemical formula: LIFEP04

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### **Section 2. Hazards Identification**

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<b>Protective Clothing</b>	<b>EC Classification</b>	<b>Trasportation</b>
Not required with normal use	Not classified as Hazardous	See section 14

#### **Physical :**

The rechargeable Li-Ion batteries described in this Material Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer.

Under normal conditions of use, the solid electrode materials and Gel electrolyte they contain are non-reactive provided the battery integrity is maintained and seals remain intact.

## Chemical :

Classification of dangerous substances contained into the product as per directive 67/548/EEC

### 1 – Nature of special risks :

- H 201 Reacts with water
- H 301 Harmful in contact with skin
- H 302 Harmful if swallowed
- H 303 Risk of serious damage to the eye
- H 304 May cause sensitization by inhalation and skin contact
- H 305 May cause sensitization by skin contact

### 2 – Safety advices :

- P 201 Keep out of reach from children
- P 202 Keep away from moisture
- P 203 Do not breathe dust
- P 204 Avoid contact with skin
- P 205 Wear suitable protective clothing
- P 206 Wear suitable gloves
- P 301 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention
- P 302 In case of accident, seek medical attention
- P 303 May cause sensitization by inhalation and skin contact
- P 304 May cause sensitization by skin contact

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## Section 3. Composition Information on Ingredients

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**Under normal use, this battery is not expected to expose user to hazardous ingredients.** The materials contained in the battery may only become a hazard if the battery or the cell is disintegrated or if the battery is physically or electrically abused. As manufactured, there is no metallic lithium in the lithium-ion battery.

Ingredient	CAS Number	Percent of Content	Classification & Hazard labeling
Lithium Iron Phosphate	15365-14-7	20-30%	Eye, Skin, Respiratory irritant
Carbon, as Graphite	7440-44-0	15-20%	Eye, Skin, Respiratory irritant
Aluminum metal	7429-90-5	7-10%	Inert
Copper metal	7440-50-8	7-10%	Inert
Electrolyte Solvent sensitizer; eye, skin, respiratory irritant.)		20-30%	Mixture (Flammable; reactive;
Ethylene carbonate	96-49-1		
Dimethyl carbonate	616-38-6		
Ethyl methyl carbonate	623-53-0		
Li-Hexafluorophosphate	21324-40-3		

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## Section 4. First Aid Measures

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In case of contacting the materials from a damaged or ruptured cell or battery:

Eye contact: Washing immediately with plenty of water and soap or for at least 15 minutes. Get medical attention.

Skin Contact: Washing immediately with water and soap.

Inhalation of Vented Gas: Remove to fresh air. Get medical attention.

Ingestion: Get medical attention immediately.

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## Section 5. Fire Fighting Measures

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Extinguishing Media: Dry chemicals, water spray, CO<sub>2</sub>, or regular foam.

Fire-Fighting Procedures: Use self-contained breathing apparatus and protective clothing.

Unusual Fire and Explosion Hazards:

Toxic gases (HF, PF<sub>6</sub>) will be formed if cells or battery are involved in a fire. Cells or battery may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over-voltage conditions.

Damaged or opened cells or batteries may result in rapid heat and the release of flammable vapors.

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## 6. Accidental release measures

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The material contained within the batteries would only be expelled under abusive conditions.

Using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place in approved container (after cooling if necessary) and dispose in accordance with local regulations.

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## 7. Storage and Handling

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Do not store batteries in a manner that allows terminals to short circuit.

Do not place batteries near heating sources, nor exposed to direct sunlight for long periods. Elevated temperatures can result in reduced battery service life.

Charging Battery

Use only approved chargers and procedures. Improperly charging a cell or battery may cause the cell or battery to flame or damage.

Battery Disassembly

Never disassemble a battery. Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapors that may be emitted.

#### Battery Short Circuit

Do not short-circuit a battery. A short circuit can result in over-heating of the terminals and provide an ignition source.

More than a momentary short circuit will generally reduce the cell or battery service life and can lead to ignition of surrounding materials or materials within the cell or battery if the seal integrity is damaged. Extended short-circuiting creates high temperature in the cell and at the terminals. Physical contact to high temperatures can cause skin burns. In addition, extended short-circuit may cause the cell or battery to flame.

Avoid reversing cell polarity within a battery assembly. Reversing cell polarity may cause the cell or battery to flame or to emit gases.

#### Mixed Batteries and Types

Avoid to use old and new cells or cells of different sizes; different chemistry or types in the same battery assembly.

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## 8. Exposure Controls/Personal Protection

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Respiratory protection : Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment.

Hand protection : Not necessary under normal use. Use Viton rubber gloves if handling a leaking or ruptured battery.

Eye protection : Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.

Skin protection : Not necessary under normal use. Use rubber apron and protective working in case of handling of a ruptured battery

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## 9. Physical and Chemical Properties

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Appearance : (Physical shape and color as supplied) Metal squares, hermetically sealed and fitted with an external plastic box.

Temperature range :

Discharge: -30 / + 60°C

Charging: -30 / +60°C

Storage: -30 / + 60°C (for less than 1 month) ; -20- + 35°C (for less than 6 month)

Specific energy :  $\approx 80-85$  Wh/kg (Note : Wh = Nominal voltage x Rated Ah as defined in IEC standard N° 285. kg = Average battery weight)

Specific pulse power :  $\approx 100$  Wh/kg

Mechanical resistance : As defined in relevant IEC standard

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## 10. Stability and Reactivity

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Conditions to avoid : Heat above 60°C or incinerate. Deform, mutilate, crush, pierce, disassemble.

Short circuit. Prolonged exposure to humid conditions.

Materials to avoid : N/A.

Hazardous decomposition products : Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium hexafluorophosphate(LiPF<sub>6</sub>) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

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## 11. Toxicological Information

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Aliant rechargeable Li-Ion batteries do not contain toxic materials.

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## 12. Ecological Information

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When properly used or disposed Aliant rechargeable Li-Ion batteries do not present environmental hazard.

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## 13. Disposal Procedures

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Aliant Li-ion cells and batteries contain no toxic metals, only naturally occurring trace elements. It is advisable to consult with local authorities as disposal regulations may vary dependent on location.

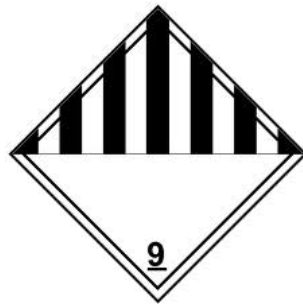
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## 14. Transportation

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Aliant Lithium-ion cells and batteries (UN3480) can be shipped as Fully Regulated Dangerous goods, because they comply with all shipping regulations as prescribed by all industry and legal standards referred to Lithium Batteries OVER 100 Wh. Described under this document, batteries are more than 100 Watt-hour. Cells or batteries are of the type proven to meet the requirements of each test in the UN Manual of Test and Criteria, Part III, Subsection 38.3. They meet the requirements for transportation under :

- INTERNATIONAL CIVIL AVATION ORGANISATION (ICAO) and the INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) DGR 55nd edition [2018] – **Section I of the Packing Instruction (PI) 965 (Batteries)**
- INTERNATIONAL MARITIME ORGANISATION (IMO) – IMDG Special Provision 188 and 230;
- US Department of Transportation (DOT) – 49 CFR 173.185 and Special Provision 188.



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.

They do not contain any prototype, heavy, recalled and/or defective batteries.

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## 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

### 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: P201: Keep out of the reach of children

### REACH Regulation

Registration of import of RAW MATERIALS: ELSA Solutions does not fall under this requirement since it does not import raw materials into Europe. ELSA Solutions only imports finished articles under the auspices of REACH and therefore does not need to register.

Safe handling for "Substances of Very High Concern" (or SVHC): The REACH regulations cover various SVHC substances and provides safe handling instructions for those substances. The list of SVHC substances is dynamic and is subject to changes at times. The current list is available on the portal of the European Chemicals Agency (ECHA) – Candidate List. ELSA Solutions periodically reviews this list and subjects its products to external laboratory tests to determine if any of such SVHC substances are present in its products. ELSA Solutions is confident that it does not use any of the listed SVHC substances in its manufacturing under its control.

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## 16. Other Information

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The information contained herein is based on the data available to us and believed in good faith to be accurate at the date of the operation. However, ELSA Solutions srl makes no warranty, expressed or implied. Users should consider the data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.