MSDS – MATERIAL SAFETY DATA SHEET

Section 1. Product and Company Identification

Product

Product Name:

Aliant Lithium-Iron Phosphate Battery

Models: **ALIANT BATTERY TYPES EK**

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

System:

Rechargeable Lithium-ion Battery

Company

Company Name:

ELSA Solutions srl

Via Pietro Patarini 15, 40026 IMOLA (BO) ITALY

Company Phone Number: +39 0542 362470

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: LIFEPO4

Section 2. Hazards Identification

Protective Clothing	EC Classification	Trasportation
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.

ALIANT ULTRALIGHT BATTERY E' UN PRODOTTO BY ELSA SOLUTIONS srl – VIA P. PATARINI 15 - 40026 IMOLA (BO) – ITALY

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Chemical :

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

1 – Nature of special risks :

R 14 Reacts with water
R 21 Harmful in contact with skin
R 22 Harmful if swallowed
R 41 Risk of serious damage to the eye
R 42/43 May cause sensitization by inhalation and skin contact
R 43 May cause sensitization by skin contact

2 – Safety advices :

S 2 Keep out of reach from children
S 8 Keep away from moisture
S 22 Do not breathe dust
S 24 Avoid contact with skin
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention
S 36 Wear suitable protective clothing
S 37 Wear suitable gloves
S 45 In case of accident, seek medical attention
R 42/43 May cause sensitization by inhalation and skin contact
R 43 May cause sensitization by skin contact

Section 3. Composition Information on Ingredients

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		20-30%	Mixture (Flammable; reactive; sensitizer; eye, skin, respiratory irritant.)
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

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.

Section 5. Fire Fighting Measures

Extinguishing Media: Dry chemicals, water spray, CO2, or regular foam.
Fire-Fighting Procedures: Use self-contained breathing apparatus and protective clothing.
Unusual Fire and Explosion Hazards:
Toxic gases (HF, PF6) 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.

6. Accidental release measures

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.

7. Storage and Handling

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.

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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.

8. Exposure Controls/Personal Protection

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

9. Physical and Chemical Properties

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

Temperature range :

Discharge: -20 / + 60°C

Charging: -20 / +60°C

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

Specific energy: ≈ 90-110 Wh/kg

(Note: Wh = Nominal voltage x Rated Ah as defined in IEC standard N° 285. kg = Average battery weight)

Specific pulse power: ≈ 100 W/kg

Mechanical resistance: As defined in relevant IEC standard

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10. Stability and Reactivity

Conditions to avoid : Heat above 70°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(LiPF6) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

11. Toxicological Information

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

12. Ecological Information

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

13. Disposal Procedures

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.

14. Transportation

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 reffered 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 [2014] – **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.

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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.

15. Regulatory information

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 know 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 it's amendments.
Risk Phrases: None
Safety Phrases: S2: Keep out of the reach of children

16. Other Information

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.

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