



## MATERIAL SAFETY DATA SHEET

In Article 31 of EC Regulation No. 1907/2006 (called REACH) it establishes that the safety data sheet must be prepared by the supplier of a substance or mixture and must be drawn up in accordance with Annex II of this Regulation. For items, the Safety Data Sheets are not provided for by the REACH Regulation but this Material Safety Data Sheet is prepared in such a way as to provide the user with all the information necessary for safe use.

### 1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY / FIRM

- Product name:

REVOLITHIUM ACCUMULATOR (BATTERY)

- Use of the product:

Electric storage accumulator

- Details of the supplier of the Voluntary Product Information Sheet:

Company: INDUSTRIAL BATTERY SERVICE ITALIA S.R.L.

Address: Via Caviglia, 3 - 20139 Milano (MI)

Telephone: (+39) +39 022 111 69 68

E-mail: [assistenza@ibsbatterie.it](mailto:assistenza@ibsbatterie.it)

- Emergency telephone number:

- Poison Control Center of Milan +39 02 66101029 (CAV Niguarda Ca 'Granda Hospital - Milan)
- Poison Control Center of Pavia +39 0382 24444 (CAV IRCCS Maugeri Foundation - Pavia)
- Florence Poison Control Center +39 055 7947819 (CAV Careggi Hospital - Florence)
- Rome Poison Control Center +39 06 3054343 (CAV Policlinico Gemelli - Rome)
- Rome Poison Control Center +39 06 49978000 (CAV Policlinico Umberto I - Rome)
- Poison Control Center of Naples +39 081 7472870 (CAV Cardarelli Hospital - Naples)
- Bergamo Poison Control Center +39 035 269 460 - 800 883300 (CAV Papa Giovanni XXIII Hospital - Bergamo)

<http://apps.who.int/poisoncentres>

### 2. HAZARDS IDENTIFICATION

The batteries are configured as articles with integrated substance / mixture and are not hazardous substances or hazardous mixtures for which the classification criteria provided for by Regulation (EC) N ° 1272/2008 do not apply.

Under the normal operating conditions of the Lithium Battery, described in the instructions for use provided, the article, in the integrity of the product, does not present any particular dangers for humans or the environment. During normal use, the integrity of the battery is preserved and the active components it contains are isolated from the outside.

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In particular, the battery must not be subjected to any mechanical abuse (opening, drilling, immersion), thermal (fire, heating to temperatures above the normal temperature range of the product) or electrical (short circuit, recharging, forced discharge), so not to cause the activation of the safety valves and / or the rupture of the battery container.

Accidental release of the internal components of the cell or of their combustion products could be highly dangerous. Exposing the battery contents to moisture or water may cause the battery to open violently / explode / fire, depending on the causes and circumstances.

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

The main dangerous ingredients contained in the article are listed below:

CAS Number EC Number	Chemical Name	Hazard in compliance with Reg. 1272/2008	Percentage
15365-14-7 476-700-9	Lithium Iron Phosphate (LiFePO <sub>4</sub> )	-	25 - 35%
7440-44-0 931-328-0	Carbon, as Graphite	-	12 - 18%
7429-90-5 231-072-3	Aluminum Metal	-	3 - 7%
7440-50-8 231-159-6	Copper Metal	-	5 - 9%
96-49-1 202-510-0	Ethylene carbonate	Acute Tox. 4 H302 Eye Irrit. 2 H319 STOT Rep. Exp. 2 H373	3 - 5%
616-38-6 210-478-4	Dimethyl carbonate	Flam. Liquid 2 H225	3 - 5%
623-53-0 433-480-9	Ethyl methyl carbonate	Flam. Liquid 2 H225	3 - 5%
21324-40-3 244-334-7	Lithium Hexafluorophosphate	Acute Tox. 3 H301 Skin Corr. 1A H314 Eye Damage 1 H318 STOT Rep. Exp. 1 H372	1 - 3%



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### 4. FIRST AID MEASURES

#### **Description of first aid measures in case the battery is open, broken or leaking:**

In case of accidental spillage, prevent contact with skin and eyes.

Inhalation: The contents of an open cell could cause irritation to the respiratory tract and mucous membranes. Transfer the subject to a well-ventilated area and, if necessary, administer emergency medical oxygen / CPR. Consult a physician.

Eye contact: Immediately flush with water for at least 15 minutes, holding the eyelids apart. Consult a physician

Skin contact: Rinse the affected area with plenty of water for at least 15 minutes. Promptly remove contaminated clothing and, if necessary, consult a doctor.

Ingestion: Do not induce vomiting. Consult your doctor.

### 5. FIRE-FIGHTING MEASURES

#### **Fire fighting**

In the event of a lithium battery fire, the use of large quantities of water or aqueous-based foams involves some cooling and is effective in preventing the spread of flames, at least until the fire is extended to the point where it is exposed. lithium contained inside (highlighted by intense red flames). Do not use hot or boiling water.

Do not use Halon or CO<sub>2</sub> type extinguishers.

Do not use sand, dry powder or soda ash, graphite powder or fire blankets.

On exposed lithium, use only Class D metal fire extinguishers.

#### **Fire fighting procedures**

Firefighters must wear self-contained or certified self-contained pressure respirators.

Full protective clothing is required to avoid potential body contact with the electrolyte solution.

Be very careful when vaporizing water as the lithium pieces could be thrown outside the area affected by the fire.

Any type of extinguishing media specified above may be used on batteries or their packaging material. Cool the outside of the batteries if exposed to fire to prevent rupture.



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If the cells or batteries are not in the center of the fire, large amounts of water can be thrown through a nozzle diffuser to keep the cells cool during containment and extinguishing the fire. An automatic sprinkler extinguishing system might be suitable for the purpose; however, a critical factor is that lithium cells cannot withstand temperatures above the melting point of lithium (180 ° C).

Water in small quantities such as that contained in portable fire extinguishers should never be used. Standard powder extinguishers are not effective.

The interaction of water or water vapor and exposed lithium hexafluorophosphate (Li PF<sub>6</sub>) can result in the generation of hydrogen and hydrogen fluoride (HF) gas. Contact with battery electrolyte can be irritating to skin, eyes and mucous membranes. Fire will produce irritating, corrosive and / or toxic gases. The fumes can cause dizziness or choking.

### 6. MEASURES IN CASE OF ACCIDENTAL RELEASE

**Procedures for decontamination:** If possible, stop release. Avoid contact with any spilled material. Contain the spilled liquid with dry sand, earth or vermiculite, isolate the hazardous area and prohibit entry into that area. Restrict access to emergency responders.

**Personal precautions:** have employees evacuate from the area until the fumes are completely dispersed. In the event of electrolyte leakage from a cell or battery, do not inhale the vapors and do not touch the liquid with your bare hands.

**Precautions for environmental protection:** avoid contamination of sewers, surface water and groundwater. Avoid contamination of soil and atmosphere.

### 7. HANDLING AND STORAGE

**Handling:** Do not expose the battery or cell to extreme temperatures or fire. Do not disassemble, crush or puncture the battery. Do not overcharge or over discharge the battery. Do not mix batteries of different types or sizes. Do not connect (short) the positive and negative terminals or place the batteries on conductive metal. Do not mix batteries of different types or new batteries with used batteries.

**Storage:** Insulate the positive and negative terminals when not in use to avoid short circuit. Ensure sufficient space between the batteries and other surfaces. Store in a dry, cool (25 ° C +/- 5 ° C, 10-50% RH) and well-ventilated place. High temperatures can reduce battery life and reduce the venting of flammable liquids and gases. Keep batteries away from oxidants and strong acids. Keep out of reach of children.



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## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

Ingredients	ACGIH	US NIOSH	OSHA
Lithium Iron Phosphate	5.0 mg/m <sup>3</sup> (as iron fume)	-	10.0 mg/m <sup>3</sup> (as iron fume)
Aluminum Metal	TLV-TWA 1mg/m <sup>3</sup>	REL-TWA 2mg/m <sup>3</sup> REL-TWA 5mg/m <sup>3</sup> REL-TWA 10mg/m <sup>3</sup>	PEL-TWA 5mg/m <sup>3</sup> PEL-TWA 15mg/m <sup>3</sup>
Copper Metal	TLV-TWA 0.2mg/m <sup>3</sup> TLV-TWA 1mg/m <sup>3</sup>	REL-TWA 1mg/m <sup>3</sup> REL-TWA 0.1mg/m <sup>3</sup>	PEL-TWA 0.1mg/m <sup>3</sup> PEL-TWA 1mg/m <sup>3</sup>

### Respiratory protection (NIOSH / MSHA approved):

Not required under normal conditions. In all cases of fire, use self-contained breathing apparatus.

### Skin protection:

Not required under normal conditions. If the battery housing is damaged, use rubber gloves with elbow length gloves, apron, clothing and boots.

### Eye protection:

Not required under normal conditions. If the battery housing is damaged, use chemical goggles or face protection.



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### 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state: solid

### 10. STABILITY AND REACTIVITY

#### **Reactivity**

The product is not reactive under normal conditions of use.

#### **Chemical stability**

This product is stable under normal conditions at room temperature. No decomposition reactions occur under normal use conditions.

#### **Possibility of hazardous reactions**

No dangerous reactions are known under normal conditions of use.

#### **Conditions to avoid**

Avoid exposing the battery to high temperatures. Do not incinerate, deform, mutilate, crush, puncture, short circuit or disassemble.

#### **Incompatible materials**

oxidizing agents, bases and water. Avoid contact of the electrolyte with aluminum or zinc.

#### **Hazardous decomposition products**

Carbon monoxide, carbon dioxide, lithium oxide fumes.

Hydrogen (H<sub>2</sub>), lithium oxide (Li<sub>2</sub>O) and lithium hydroxide (LiOH) powder are produced by the reaction of lithium with water (hydrolysis).

### 11. TOXICOLOGICAL INFORMATION

Acute toxicity: No data available

Skin corrosion / irritation: No data available

Serious eye damage / irritation: No data available

Skin or respiratory sensitization: No data available

Germ cell mutagenicity: No data available

Carcinogenicity: No data available

Reproductive toxicity: No data available

Specific target organ toxicity - single exposure: No data available

Specific target organ toxicity - repeated exposure: No data available

Aspiration hazard: No data available

Information on likely routes of exposure: No data available

Eyes: No data available

Skin: No data available

**MATERIAL SAFETY DATA SHEET****12. ECOLOGICAL INFORMATION**

Environmental toxicity: No data available  
Persistence and degradability: No data available  
Bioaccumulative potential: No data available  
Mobility on soil: No data available  
Other adverse effects: No data available

**13. DISPOSAL CONSIDERATIONS**

Lithium batteries are fully recyclable. Return the battery for disposal to the distributor, to the manufacturer for recycling.  
Exhausted lead accumulators are classified as "hazardous waste" and their transfer to a specific consortium for disposal by recycling is required by law. It is forbidden to leave this waste in the environment. Lithium batteries, unlike other types, are not mentioned in the European List of Waste, therefore the generic code 16 06 05 is attributed - other batteries and accumulators.  
To simplify collection and recycling or reprocessing, used lithium batteries should not be mixed with other batteries.

**14. TRANSPORT INFORMATION**

The lithium batteries placed on the market have passed the UN38.3 test.

**UN number**

UN N ° (ADR / RID / ADN) UN3480  
UN N ° (IMDG) UN3480  
UN (ICAO) UN3480

**UN proper shipping name, Proper Shipping Name**

LITHIUM ION BATTERIES

**Transport hazard classes**

ADR / RID / ADN Class 9  
IMDG class 9  
ICAO Class / Division 9

**Packing group**

ADR / RID / ADN packing group -  
IMDG packing group -  
ICAO Packing Group -





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### 15. REGULATORY INFORMATION

The batteries are configured as articles with integrated substance / mixture and are not hazardous substances or hazardous mixtures for which the classification criteria provided for by Regulation (EC) N ° 1272/2008 do not apply.

### 16. OTHER INFORMATION

#### **Bibliography and data sources**

EC Regulation No. 1907/2006 (REACH) (and subsequent amendments and adjustments)

EC Regulation No. 1272/2008 (CLP) (and subsequent amendments and adjustments)

ECHA Agency website

Legislative Decree of 03/04/2006 n ° 152 - Environmental regulations

Transport regulations according to ADR, RID, IMDG and IATA.

The above information is based on the present state of knowledge and does not constitute a guarantee of the condition of the product. This information is not part of any contractual agreement.

It remains the user's responsibility to comply with the laws and regulations in force.

INDUSTRIAL BATTERY SERVICE ITALIA S.R.L. assumes no responsibility for any damage, loss or injury that may result from the use of the information contained in this voluntary product information sheet.