LION BATTERIES

MATERIAL SAFETY DATA SHEET

LI-ION ($LiFePO_4$) BATTERY

COMPANY DETAILS
Company: Lion Batteries (Wholesale) Pty Ltd
(A.C.N. 002 156 256)

Address: 20 Rowood Rd., Prospect NSW 2148

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1. IDENTIFICATION

Product Name: Lithium Ion Phosphate Battery
Other Name: LiFePO4 Battery
Use: Starting, lighting, power, ignition for car, truck, boats, motorcycles etc
UN Number: 3480
Dangerous Goods Class: N/A

Physical Description/Properties

Appearance: Rectangular plastic casing with exposed terminals for electrical connections.

2. HAZARD INFORMATION

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

Under normal conditions of use, electrode materials and liquid electrolyte they contain are non-reactive provided the battery integrity is maintained and seals remain intact, Risk of exposure only in case of abuse, e.g. mechanical, thermal, electrical, which leads to the activation of safety valves and/or the rupture of the battery containers. Electrolyte leakage, electrode materials reaction with moisture/water of battery vent/explosion/fire may follow depending upon circumstances.

Hazardous Ingredients

Substance	Chemical Symbol	Content (%)	Melting Point℃	Indication of Danger	Special Risk	Safety Advice	CAS No.
Lithium ion phosphate	$LiFePO_4$	23~33	> 1000		R22, R43	S2, S22, S24, S26, S36, S37, S45	15365-14-7
Carbon	C	12~17	> 1000				7440-44-0
Organic Solvents	EC PC DEC	3	EC : 38°C PC : -49°C DEC : -43°C	Flammable	R21, R22, R41, R42, R43	S2, S24, S26, S36, S37, S45	
	$LiPF_6$		N/A	Irritant Corrosive	R14	S2, S8, S22, S24, S26, S36	21324-40-3

slight variations depending from all type

1. **Name of Special Risks:**

R14/15 Reacts with water and yields flammable gases.
R21 Harmful if contacted with skin.

R22	Harmful if swallowed.
R35	Causes severe burns.
R41	Risk of serious damage to the eye.
R42/43	May cause sensitisation by inhalation and skin contact.
R43	May cause sensitisation by skin contact.

2. Safety Advices:

S2	Keep out of reach from children.
S8	Keep away from moisture.
S22	Do not breathe dust.
S24	Avoid contact with skin.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.
S36	Wear suitable protective clothing.
S37	Wear suitable gloves.
S45	In case of incident, seek medical attention.

3. HEALTH HAZARD INFORMATION

In case of battery rupture or explosion, evacuate personnel from contaminated area and provide maximum ventilation to clear out corrosive fumes/gases and pungent odors.

In all cases, seek immediate medical attention:

Eye contact:	Flush with plenty of water (eyelids-held open) for at least 15 minutes.
Skin contact:	Remove all contaminated clothing and flush affected areas with plenty of water and soap for at least 15 minutes.
Ingestion:	Dilute by giving plenty of water and get immediate medical attention. Assure that the victim does not aspirate vomited material by use of positional drainage. Assure that mucus does not obstruct the airway. Do not give anything by mouth to an unconscious person.
Inhalation:	Remove to fresh air and ventilate the contaminated area. Give oxygen or artificial respiration if needed.

4. FIRE FIGHTING MEASURES

Fire and explosion hazard:	The batteries can leak and/or spout vaporized or decomposed and combustible electrolyte fumes in case of exposure above 90°C resulting from inappropriate use or from the environment. Possible formation of hydrogen fluoride (HF) and phosphorous oxides during fire. $LiPF_6$ salt contained in the electrolyte releases hydrogen fluoride (HF) in contact with water.
Extinguishing media:	Suitable : CO2, Dry chemical or Foam extinguishers Not to be used : Type D extinguishers
Special exposure hazards:	Following cell overheating due to external source or due to improper use, electrolyte leakage or battery container rupture may occur and release inner component/material in the environment. Eye contact: The electrolyte solution contained in the battery is irritant to ocular tissues. Skin contact: The electrolyte solution contained in the battery causes skin irritation. Ingestion: The ingestion of electrolyte solution causes tissue damage to throat and gastro/respiratory tract. Inhalation: Contents of a leaking or ruptured battery can cause respiratory tract, mucus, membrane irritation and edema.
Special protective equipment:	Use self-contained breathing apparatus to avoid breathing irritant fumes. Wear protective clothing and equipment to prevent body contact with electrolyte solution.

5. 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.

6. HANDLING AND STORAGE

The batteries should not be opened destroyed or incinerated since they may leak or rupture and release in the environment the ingredients they contain.

Handling	Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) material. Do not directly heat or solder. Do not throw into fire. Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in non-conductive (i.e. plastic) trays.
Storage	Store in a cool (preferably below 30°C) and ventilated area away from moisture, sources of heat, open flames, food and drink. Keep adequate clearance between walls and batteries. Temperature above 90°C may result in battery leakage and rupture. Since short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them.
Other	Manufacturer recommendations regarding maximum recommended currents and operating temperature range. Applying pressure or deforming the battery may lead to disassembly followed by eye, skin and throat irritation.

7. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection:	Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment. Equipment with type ABEK filter.
Hand protection:	Not necessary under normal use. Use 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.

8. PHYSICAL & CHEMICAL PROPERTIES

Cells are not single chemical material: there are no specific physical and chemical properties such as melting point and boiling point.

Boiling Point @ 760 mm Hg (°C):	Not Applicable
Vapor Pressure (mm Hg @ 25°C):	Not Applicable
Vapor Density (Air = 1):	Not Applicable
Density (grams/cc):	Not Applicable
Percent Volatile by Volume (%):	Not Applicable
Evaporation Rate (Butyl Acetate = 1):	Not Applicable
Physical State:	Not Applicable
Solubility in Water (% by Weight):	Not Applicable
pH:	Not Applicable
Appearance and Odor:	Geometric solid object

9. STABILITY AND REACTIVITY

Conditions to avoid	Heat above 90°C or incinerate. Deform, mutilate, crush, pierce, or 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 ($LiPF_6$) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

10. TOXILOGICAL INFORMATION

The Li-ion batteries do not contain toxic materials

11. ECOLOGICAL INFORMATION

When properly used or disposed, the Li-ion batteries do not present an environmental hazard.

12. DISPOSAL CONSIDERATIONS

Dispose in accordance with applicable regulations which vary from country to country. (In more countries, the thrashing of used batteries is forbidden and the end-users are invited to dispose them properly, eventually through not-for-profit organizations, mandated by local governments or organized on a voluntary basis by professionals).

Lithium-Ion batteries should have their terminals insulated and be preferably wrapped in plastic bags prior to disposal.

Incineration: Incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.

13. TRANSPORT INFORMATION

The consignment complies with the current edition-51th, 2010 of the IATA DGR.
Description: Lithium ion battery（UN3480）

1. This consignment is complies with Section II of PI965 of IATA DGR 51TH Ed.
2. UN manual of Tests and criteria, part III, sub-section 38.3 (withstanding a 1.2m drop test)
3. With watt hour rating less than 20Wh per cell or 100Wh per battery.

The consignment can be shipped as “Not Restricted” in accordance with the current edition of IATA-DGR-2010. (UN3480)

A) This consignment 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 comply with the Section II of PI965
D Handle with care. Flammability hazard exists if the package is damaged.
E) In any event of the package is found to be damaged, please follow the special procedures. 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

No	ITEMS	RESULT	REMARKS
1	Altitude simulation	Pass	Test 1 to 5 must be conducted in sequence on the same cell or battery
2	Thermal test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External short circuit	Pass	
6	Impact	Pass	
7	Overcharge	Pass	Only battery do need this test item
8	Forced Discharge	Pass	

The product is not classified as dangerous under the current edition of the 51th, 2010 of the IATA DGR. dangerous goods regulations and according the Section II of PI965 all applicable carriers. The product is safe for air transportation and not regulated by IATA DGR.

Product has been passed UN38.3 Test & declare that the lithium battery are not restricted & complies to Section II of PI965 - PI970.

14. CONTACT POINT

CONTACT INFORMATION

Australian Poisons Information Centre (24 Hour Service)
Telephone: 13 11 26

Police or Fire Brigade (24 Hours)
Telephone: 000

Ambulance (24 Hours)
Telephone: 000

15. DATE OF ISSUE

1st January 2018
Ver 1.1

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