Material Safety Data Sheet: Lithium Ion Phosphate (LiFePO4) Batteries

Section 1 – Product Identification

1.1 Product
Li-ion Cell for the energy supply of portable powered respirators

1.2 Supplier
Mackwell Electronics Ltd.
Vigo Place
Aldridge
West Midlands
WS9 8UG
England

+44 (0) 1922 458255

Section 2 – Hazardous Classification

Explosive risk	This article does not belong to the explosion dangerous goods
Flammable risk	This article does not belong to the flammable material
Oxidation risk	This article does not belong to the oxidation of dangerous goods
Toxic risk	This article does not belong to the toxic dangerous goods
Radioactive risk	This article does not belong to the radiation of dangerous goods
Mordant risk	This article does not belong to the corrosion of dangerous goods
Other risk	This article is the Lithium ion battery.

Section 3 - Composition / Information on Ingredients

Chemical Name	Chemical Formula	CAS No.	Composition (in % of total weight)
Lithium Iron Phosphate	LiFePO4	15365-14-7	25-30
Graphite	C	7782-42-5	15-20
PVDF	(CH2-CF2)n	24937-79-9	1-5
Acetylene Black	C	1333-86-4	0.5-3
Aluminum	Al	7429-90-5	21-23
Copper	Cu	7440-50-8	10-11
Lithium hexafluorophosphate	LiPF6	21324-40-3	10-15

Section 4 – First Aid Measures

In case of cell leakage, precautions must be followed to avoid any contact with human tissue. If this accidentally happens then please follow these measures:

Inhalation	Remove to fresh air immediately. Rinse mouth and nose with water. Seek Medical attention.
Skin	Remove any contaminated clothing and wash skin with soap and water. Seek medical attention if irritation develops.
Eyes	Do not rub eyes. Rinse immediately with plenty of water for 15-30 minutes and seek immediate medical attention. Seek an eye specialist.
Ingestion	Immediately wash the mouth with large amounts of clean water then drink plenty of water. Do not induce vomiting. Immediate medical attention is required.

Section 5 – Fire Fighting Measures

Extinguishing Media	Water, CO2
Special Protective Equipment	Use self-contained breathing apparatus and full fire-fighting protective clothing.
Special Exposure Hazards	Cell may vent when subjected to excessive heat-exposing battery contents.

Section 6 – Accidental Release or Spillage

Steps to be taken in case Material is Released or Spilled If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

Section 7 – Handling and Storage

- Batteries should be handled and stored carefully to avoid short circuits
- Do not store in disorderly fashion, or allow metal objects to be mixed with stored batteries
- Never disassemble a battery as spontaneous combustion of the negative electrode is possible, particularly if the electrode is removed from its metal container
- Do not breathe cell vapours or touch internal material without using protective rubber gloves

Section 8 – Exposure Controls and Personal Protection

Under normal conditions of use and handling, no special protection is required for sealed LiFePO4 cells. However, it is recommended to wear neoprene or natural rubber gloves, or to remove rings and metallic objects to avoid short-circuiting the cells.

Section 9 – Physical / Chemical Characteristics

Appearance	Cylindrical cell.
Temperature range	0°C to +55°C – Risk of Electrolyte leakage over 100°C
Mechanical resistance	According mechanical tests in IEC 62133-2 standard

Section 10 – Stability and Reactivity

Stability:	Product is stable under conditions described in Section 7.
Conditions to Avoid :	Heat above 70°C or incinerate. Deform. Mutilate. Crush. Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions.
Materials to avoid:	Oxidising agents, alkalis, water.
Hazardous Decomposition Products:	Toxic Fumes, and may form peroxides.
Hazardous Polymerization:	N/A.

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

Section 11 – Toxicological Information

The sealed battery cells as a product will not present toxicological hazards.

Section 12 – Ecological Information

Mammalian effects:	None known at present.
Eco-toxicity:	None known at present.
Bioaccumulation potential:	Slowly Bio-degradable
Environmental fate:	None known at present

Section 13 – Disposal Considerations

Do not incinerate, or subject cells to temperature in excess of 70°C, Such abuse can result in loss of seal leakage, and/or cell explosion.

Dispose of in accordance with appropriate local regulations.

Section 14 – Transportation Information

Label for conveyance: Lithium Battery Label, or Lithium Battery Class 9 Hazard Label, or Cargo Aircraft Only Label.
UN Number: UN3480 or UN3481
Packaging Group: Not Applicable

Marine pollutant: No

Proper Shipping name: Lithium Ion Batteries (Including Lithium Polymer Batteries) , Lithium Ion Battery Packed with Equipment,

Transport information: Lithium ion battery is of a type proved to meet the requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3. The lithium-ion battery with a watt-hour rating not exceeding 100Wh or the cell with the watt-hour rating is not exceeding 20Wh.

The lithium-ion battery according to Section II/Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966~967 of the IATA Dangerous Goods Regulations 62nd Edition may be transported.

The goods shall comply with the requirements of special provision 188 of IMDG CODE (Amdt. 40-20) 2020, The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen appropriately.

Section 15 – Regulatory Information

- EU Battery Directive 2006/66/EC + Amendment 2013/56/EU
- REACH EC 1907/2006

Section 16 – Other information

The information contained in this document has been gathered from sources considered reliable and was to the extent of our knowledge, accurate and reliable at the date of issue. This information however cannot be considered completely comprehensive and does not imply an implicit or specific guarantee.

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