

## LFP Battery Safety Data Sheet

According to EEC Directive 93/112/EC

### PRODUCT ID

Lithium iron phosphate (LFP/LiFePO<sub>4</sub>) three cell battery pack, item no. 33'275'813

### SAFETY DATA SHEET SUPPLIER

Sander Elektronik AG  
Stauseestrasse 73  
5314 Kleindöttingen  
Switzerland  
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### EMERGENCY TELEPHONE NUMBER

+41 56 268 61 40 during office hours: Monday to Friday 8 to 16 h  
National emergency services

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION	
Product description	Lithium iron phosphate (LFP/LiFePO <sub>4</sub> ) rechargeable three cell battery pack
Product specification	3.2V 4.5Ah 14.4Wh
Manufacturer	Sander Elektronik AG
Manufacturer address	Stauseestrasse 73 5314 Kleindöttingen Switzerland
Issue date	16.3.2021

2. COMPOSITION INFORMATION			
Material or ingredient	Chemical formula	CAS no.	Weight (%)
Lithium iron phosphate	LiFePO <sub>4</sub>	15365-14-7	26~28
Poly(vinylidene fluoride)	[-CH <sub>2</sub> -CF <sub>2</sub> -] <sub>n</sub>	24937-79-9	0.9~1.1
Sodium carboxymethyl cellulose	[C <sub>6</sub> H <sub>7</sub> O <sub>2</sub> (OH) <sub>2</sub> OCH <sub>2</sub> COONa] <sub>n</sub>	9000-11-7	0.15~0.25
Styrene butadiene rubber	C <sub>12</sub> H <sub>14</sub>	9003-55-8	0.35~0.45
Graphite	C	1333-86-4	14~15.5
Polypropylene	(C <sub>3</sub> H <sub>6</sub> ) <sub>n</sub>	9003-07-0	2.0~3.0
Lithium hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	1.4~1.7
Dimethyl carbonate (DMC)	C <sub>3</sub> H <sub>6</sub> O <sub>3</sub>	616-38-6	2.8~3.4
Ethyl methyl carbonate (EMC)	C <sub>4</sub> H <sub>8</sub> O <sub>3</sub>	623-53-0	4.5~6.5
Ethylene carbonate	C <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-46-1	2.3~2.7
Copper foil	Cu	7440-50-8	9.0~10.0
Aluminium foil	Al	7429-90-5	3.9~4.4
Iron	Fe	7439-89-6	20.0~24.0
Lead	Pb	7439-92-1	not detected
Cadmium	Cd	7440-43-9	not detected
Mercury	Hg	7439-97-6	not detected

3. HAZARDS IDENTIFICATION	
<b>Explosion hazard</b>	This item is not classified as an explosion hazard.
<b>Flammability hazard</b>	This item is not classified as a flammability hazard.
<b>Oxidation hazard</b>	This item is not classified as an oxidation hazard.
<b>Poison hazard</b>	This item is not classified as a poison hazard.
<b>Radioactive hazard</b>	This item is not classified as a radioactive hazard.
<b>Corrosion hazard</b>	This item is not a corrosion hazard.
<b>Other hazards</b>	The battery's watt-hour rate is 14.4Wh, which belongs to lithium-ion batteries (including lithium-ion polymer batteries).

#### 4. FIRST AID MEASURES

In case of battery shell rupture, content contact may be harmful to the human body. Once contact occurs, the following emergency measures should be taken:

<b>Eye</b>	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Obtain medical aid.
<b>Skin</b>	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Obtain medical aid.
<b>Inhalation</b>	Remove from exposure and move to fresh air immediately. Use oxygen if available.
<b>Ingestion</b>	Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Obtain medical aid.

#### 5. FIREFIGHTING MEASURES

<b>Flashpoint</b>	Not applicable.
<b>Auto-Ignition Temperature</b>	Not applicable.
<b>Extinguishing Media</b>	Water, carbon dioxide
<b>Special Firefighting Procedures</b>	Self-contained respiratory protective device.
<b>Unusual Fire and Explosion Hazards</b>	Cell may vent when subjected to excessive heat-exposing battery contents.
<b>Hazardous Combustion Products</b>	Carbon monoxide, carbon dioxide, lithium oxide fumes

#### 6. ACCIDENTAL RELEASE MEASURES

##### Steps to be taken in case of material release or spill

If battery material is released, remove operators from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe the area with a cloth, remove the spilled liquid, put the leaking battery in a plastic bag, and then put it in a steel container. Leave the area and allow the battery to cool and vapours to dissipate. Avoid skin and eye contact or inhalation of vapours.

##### Waste disposal method

Fully discharge the battery and return it to a professional organisation for further treatment.

#### 7. HANDLING AND STORAGE

The battery must not be opened, destroyed or incinerated as it may explode, rupture, or leak during these processes. Do not short-circuit, overcharge, force-discharge or throw the battery into fire. Do not crush or puncture the battery, or immerse in liquids.

##### Precautions to be taken in handling and storing

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated areas exposed to small temperature change. Avoid storage at high temperatures, do not place the battery near heating equipment nor expose to direct sunlight.

The battery may explode or cause burns if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

## 8. EXPOSURE CONTROL/PERSONAL PROTECTION

<b>Respiratory Protection</b>	In case of battery venting, provide as much ventilation as possible and avoid confined areas. Respiratory protection is not necessary under conditions of normal use.
<b>Ventilation</b>	Not necessary under normal use conditions.
<b>Protective Gloves</b>	Not necessary under normal use conditions.
<b>Other Clothing or Equipment</b>	Not necessary under conditions of normal use.
<b>Personal protection during battery valve opening test</b>	Respiratory protection, protective gloves, protective clothing and safety glass covers.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Cylindrical shape
<b>Odour</b>	Smell of medical ether in case of leakage
<b>pH</b>	Not applicable.
<b>Flashpoint</b>	Not applicable unless individual components exposed.
<b>Flammability</b>	Not applicable unless individual components exposed.
<b>Relative density</b>	Not applicable unless individual components exposed.
<b>Solubility (water)</b>	Not applicable unless individual components exposed.
<b>Solubility (other)</b>	Not applicable unless individual components exposed.

## 10. STABILITY AND REACTIVITY

<b>Stability</b>	Product is stable under conditions outlined in section 7.
<b>Conditions to avoid</b>	Heat above 70 °C or incineration, deformation, mutilation, crushing, disassembly, overcharging, short-circuiting, exposure to humidity over a long period.
<b>Materials to avoid</b>	Oxidising agents, alkalis, water.
<b>Hazardous decomposition products</b>	Toxic fumes and potential formation of peroxides.
<b>Hazardous polymerization</b>	Not applicable.
In case of leakage, avoid contact with strong oxidizers, inorganic acids, strong bases, and halogenated hydrocarbons.	

**11. TOXOLOGICAL INFORMATION**

<b>Signs and symptoms</b>	None, unless battery ruptures. In the event of exposure to internal battery contents, vapour fumes may be very irritating to the eyes and skin.
<b>Inhalation</b>	Lung irritant.
<b>Skin contact</b>	Skin irritant.
<b>Eye contact</b>	Eye irritant.
<b>Ingestion</b>	Poisoning if swallowed.
Health is endangered in the event of exposure to internal battery contents: Dry or burned skin, mild or severe irritation and damage to nerves, liver and kidneys.	

**12. ECOLOGICAL INFORMATION**

<b>Mammalian effects</b>	None known at present.
<b>Eco-toxicity</b>	None known at present.
<b>Bio-accumulation potential</b>	Slowly bio-degradable.
<b>Environmental fate</b>	No known environmental hazards at present.

**13. DISPOSAL CONSIDERATION**

Do not incinerate or subject cells to temperatures in excess of 70 °C as such abuse may result in leakage and/or battery explosion. Dispose of in accordance with appropriate local regulations.

**14. TRANSPORT INFORMATION**

<b>Transportation labels</b>	Class 9 lithium battery, cargo aircraft only
<b>UN code</b>	UN3480
<b>Packaging group</b>	Not applicable
<b>EmS</b>	F-A, S-I
<b>Marine pollutant</b>	No
<b>Full shipping name</b>	Lithium-ion batteries (including lithium-ion polymer batteries)
<b>Hazard classification</b>	Compliance with the provisions of Section IB of Packing Instruction 965 of IATA 62nd Edition "Dangerous Goods Regulations" (2021 edition), IMDG Special Provision 188 (Amendment 39-18) (2018 edition) of the Maritime Dangerous Goods Regulations, including the requirements of the UN38.3 test manual.

**15. REGULATORY INFORMATION**

- Dangerous Goods Regulations
- Recommendations on the Transport of Dangerous Goods Model Regulations
- International Maritime Dangerous Goods
- List of dangerous goods
- European Agreement concerning the International Carriage of Dangerous Goods by Road
- Technical Instructions for the Safe Transport of Dangerous Goods
- Classification and code of dangerous goods
- Occupational Safety and Health Act (OSHA)
- Toxic Substance Control Act (TSCA)
- Consumer Product Safety Act (CPSA)
- Federal Environmental Pollution Control Act》 (FEPCA)
- The Oil Pollution Act (OPA)
- Superfund Amendments and Reauthorization Act Title III (302/311/312/313) (SARA)
- Resource Conservation and Recovery Act (RCRA)
- Safety Drinking Water Act (CWA)
- California Proposition 65
- Code of Federal Regulations (CFR)

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