

**SECTION 1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY****1.1 Product identification**

Trade name	: Lithium ion batteries
Product definition	: Lithium ion batteries are Articles as defined in Article 3.3 of REACH.
Registration number (REACH)	: Not applicable (no substance with intention to be released).

**1.2 Relevant identified uses and uses advised against**

Relevant identified uses	: Use the lithium ion battery in line with the instructions provided.
Uses advised against	: This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

**1.3 Details of the supplier of the safety data sheet**

Distributor :

Supplier : Landport BV  
Address: P.O. box 325. 4940 AH Raamsdonksveer. The Netherlands  
Phone: +31 (0) 162 58 14 00  
E-mail: info@landportbv.com

**SECTION 2. HAZARDS IDENTIFICATION****2.1 Hazards**

No hazards occur during the normal operation of a lithium ion battery as it is described in the instructions for use that are provided with the battery.

**2.2 Characteristics**

Lithium Ion Batteries have significant characteristics:

- When the battery is short-circuited, over charged or over heated, it may cause electrolyte of the battery leaked out or the battery exploding.
- Broken or leaking batteries may cause severe irritation or chemical burns.
- They can contain a considerable amount of energy, which may be a source of high electrical current and a severe electrical shock in the event of a short circuit.
- Standard EN-IEC 60086-4 included safety requirements for lithium batteries and battery installations and describes the basic precautions to protect against dangers deriving from electric currents, leaking gases or electrolytes.

**2.3 Labelling**

The labelling requirements are listed under section 15.

**SECTION 3. COMPOSITION AND INFORMATION ON MAIN INGREDIENTS**
**3.1 Product definition**

: Article (REACH Art. 3.3)

Chemical name	CAS number	EC Number	% (w/w) <sup>1)</sup>	Hazard statements (CLP 1272/2008) <sup>2)</sup>
Lithium iron phosphate (LiFePO <sub>4</sub> )	15365-14-7	604-917-2	20-30	Not classified
Lithium hexafluorophosphate (LiPF <sub>6</sub> )	21324-40-3	244-334-7	5-10	Acute Tox. 3 (H301); Skin Corr. 1A (H314); Eye Damage 1 (H318); STOT Rep. Exp. 1 (H372)
Copper (Cu)	7440-50-8	231-159-6	10-15	Aquatic Acute 1 (H400); Aquatic Chronic 3 (H412)
Aluminium (stabilised)	7429-90-5	231-072-3	5-10	Flam. Sol. 1 (H228); Water-react. 2 (H261)
Ethylene carbonate (EC)	96-49-1	202-510-0	5-10	Acute Tox. 4 (H302); Eye Irrit. 2 (H319); STOT Rep. Exp. 2 (H373)
Dimethyl carbonate (DMC)	616-38-6	210-478-4	5-10	Flam. Liquid 2 (H225)

1) Contents may vary due to performance data of the Battery

2) Hazard statements from public data on ECHA website; full text of the hazard statements is listed in Section 16.

**SECTION 4. FIRST AID MEASURES**

*This information is of relevance only if the Battery is broken and it results in a direct contact with ingredients.*

**4.1 First aid measures**

Inhalation	: Keep calm and quiet, to fresh air. If necessary, provide oxygen or artificial respiration. Do NOT use mouth-to-mouth resuscitation. Seek advice of a medical doctor.
Contact with skin	: Rinse with water. Remove and wash wetted clothing. Seek medical advice.
Contact with eyes	: Rinse thoroughly with plenty of water for at least 15 minutes. Remove contact lenses, if possible, and continue flushing. Consult a doctor: when eye irritation persists.
Ingestion	: Do not induce vomiting. Never give anything by mouth to an unconscious person. Drink lot of water immediately and swallow activated carbon. Consult a doctor: if irritation persists.

**SECTION 5. FIRE FIGHTING MEASURES**
**5.1 Extinguishing media**

Suitable extinguishing media	: Class D dry chemical powder or sand.
Unsuitable extinguishing media	: Water

**5.2 Special protective equipment**

: Firemen should wear fire-fighting suits with a self-contained breathing apparatus.

**5.3 Advice for fire-fighters**

: The battery may be over-heated by outside and interior short-circuit, and burning batteries may emit toxic fumes.

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Move containers from fire area if this can be done without risk. Prevent run off from fire control dilution from entering streams or drinking water supply.

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: 3 of 8
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

## SECTION 6. MEASURES TO BE TAKEN IN CASE OF ACCIDENTAL RELEASE

*This information is of relevance only if the battery is broken and the ingredients are released.*

- 6.1 Personal precautions** : Use proper personal protective equipment as indicated in Section 8. Appropriate ventilation. If electrolyte leaks or spills, do not touch or walk through electrolyte.
- 6.2 Methods and material for cleaning up** : In the event of battery rupture, prevent skin contact and collect all released material in a plastic lined container. Then clean with water (diluted acetic acid may be helpful). Dispose according to the local law and rules. Do not allow penetration into the sewage system, into earth or water bodies.

## SECTION 7. HANDLING AND STORAGE

- 7.1 Precautions for safe handling** : Keep batteries out of the reach of children. Use the batteries in line with the use instructions provided. Do not dispose in fire. Do not mix with other battery types.
- Use effective anti-short circuit measures. Do not connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents. Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case. Exhausted batteries should be immediately removed from equipment and properly disposed of.
- Do not use organic solvents or other chemical cleaners on battery. Do not disassembly or decompose. Avoid contacting with water, avoid straight sunlight. The battery should be transported with 10-50% charged states.
- 7.2 Conditions for safe storage** : Store in cool, dry conditions. Prevent condensation on cell or battery terminals. Store and display batteries in their original packing. High temperature may damage the performance of the battery, cause leaking or rusting. Protect from physical damage and short circuits. To avoid risk of fire or explosion, keep sparks and other sources of ignition away from the battery. Do not allow metal objects to simultaneously contact both positive and negative terminal of batteries. Do not stack battery directly on another battery. Do not store batteries on electrically conductive surfaces.

## SECTION 8. EXPOSURE LIMITS AND PERSONAL PROTECTIVE EQUIPMENT

- 8.1 Electrolyte (diluted sulphuric acid)**
- Possible routes of exposure : No exposure during normal use. Broken or leaking batteries may result in exposure to skin, eyes and or inhalation.
- Occupational exposure limit values : Lithium iron phosphate (LiFePO<sub>4</sub>; CAS 15365-14-7)  
No OEL's listed (source SER database).
- Lithium hexafluorophosphate (LiPF<sub>6</sub>; CAS 21324-40-3)  
No OEL's listed (source SER database).
- Copper (CAS 7440-50-8)  
8 h TWA: 1 mg / m<sup>3</sup> for copper powder / dust (Austria 2007; Belgium 2009; Denmark 2007; France 2008; Spain 2010; Sweden 2005; United Kingdom 2005);  
8 h TWA: 0,2 mg / m<sup>3</sup> for copper fume (Finland 2004; France 2008; Spain 2010; Sweden 2005; United Kingdom 2005);  
8 h TWA: 0,1 mg / m<sup>3</sup> for copper fume (Austria 2007; Denmark 2007; Finland 2004);

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: 4 of 8
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

Aluminium (CAS 7429-90-5)

8 h TWA: 10 mg / m<sup>3</sup> (Austria 2007; United Kingdom 2005; Spain 2010);  
 8 h TWA: 5 mg / m<sup>3</sup> ; 15 min TWA: 2 mg / m<sup>3</sup> (Denmark 2007; Sweden 2005)  
 8 h TWA: 1 mg / m<sup>3</sup> respirable fraction (Belgium 2009)

Ethylene carbonate (CAS 96-49-1)

No OEL's listed (source SER database).

Dimethyl carbonate (CAS 616-38-6)

No OEL's listed (source SER database).

DNEL / PNEC limit values  
 (REACH public dossier)

: Aluminium (CAS 7429-90-5)

DNEL (workers; inhalation; long term; local effects): 3, 72 mg/m<sup>3</sup>

Ethylene carbonate (CAS 96-49-1)

DNEL (workers; inhalation; long term; systemic effects): 53 mg/m<sup>3</sup>

Dimethyl carbonate (CAS 616-38-6)

DNEL (workers; inhalation; long term; systemic effects): 17, 6 mg/m<sup>3</sup>

**8.2 Engineering controls**

: General room ventilation is sufficient during normal use and handling. Do not install these batteries in sealed, unventilated areas. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**8.3 Personal protective equipment**

a) General

: Remove jewellery, rings, watches and any other metallic objects while working on battery. All tools should insulate to avoid the possibility of shorting connections. DO NOT lay tools on top of the battery. The work area should be equipped with appropriate fire equipment and leakage emergency equipment.

b) Eye/face protection

: Under normal condition of use and handling no special protection is required for sealed battery. In the event of battery case breakage: wear safety goggles with side shields or full face shield.

c) Skin / hand protection

: Under normal condition of use and handling no special protection is required for sealed battery. In the event of battery case breakage: wear appropriate gloves, boots, apron or clothing.

d) Respiratory protection

: Under normal condition of use and handling no special protection is required for sealed Battery. Use appropriate respirator if airborne dust or mist concentrations exceed the OEL values.

e) Other

: Handle in accordance with good industrial hygiene and safety instructions. Wash hands thoroughly after use and before eating or drinking.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance

: Rectangular plastic casing with exposed terminals for electrical connections,

Odour

: odourless

Solubility in water (25 °C)

: Insoluble

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: 5 of 8
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

## SECTION 10. STABILITY AND REACTIVITY

- 10.1/2 Reactivity and stability** : Stable under normal conditions.
- 10.3 Possibility of hazardous reactions** : When a battery cell is exposed to an external short-circuit, crushed, modification, high temperature, open flames, it will be the cause of heat generation and ignition.
- 10.4 Conditions to avoid** : Exposed to an external short-circuit, prolonged overcharge, crushed, modification, high temperature, open flames, incompatible materials, direct sunlight and high humidity.
- 10.5 Incompatible materials** : Conductive materials, water, seawater, strong oxidizers and acids.
- 10.6 Hazardous decomposition products:** Thermal decomposition may produce hazardous fumes of metal oxides, harmful gas and etc.

## SECTION 11. TOXICOLOGICAL INFORMATION

*This information does not apply to the finished product "lithium ion battery". This information only applies to its compounds in case of a broken product.*

### 11.1 Information on toxicological effects

- Acute toxicity : LD50 (oral / rat) >1702 mg/kg (LiPF6)  
 LD50 (oral / rat) >10000 mg/kg (Ethylene carbonate)  
 LD50 (dermal / rabbit) >3000 mg/kg (Ethylene carbonate)  
 LD50 (oral / rat) >10000 mg/kg (Dimethyl carbonate)
- Corrosion/irritation : Exposure to ingredients from a broken lithium ion battery may cause severe burns for the skin, eyes and inhalatory tract.

## SECTION 12. ECOLOGICAL INFORMATION

*This information is of relevance if the lithium ion battery is broken and the ingredients are released to the environment.*

### 12.1 Toxicity

- Acute toxicity : LC50 (fish, 96 h) < 1 mg/L (copper)  
 EC50 (daphnia magna; 48 h) < 0, 1 mg/L (copper)
- 12.2 Persistence and degradability** : No data available.
- 12.3 Bio accumulative potential** : No data available.
- 12.4 Mobility in soil** : No data available.
- 12.5 Other adverse effects** : No data available.

## SECTION 13. DISPOSAL CONSIDERATIONS / RECYCLING INFORMATION

- 13.1 Waste treatment methods** : Disposal should be in accordance with applicable regional, national and local laws and regulations. Never dispose spent lithium batteries with domestic waste. Do not incinerate, since batteries may explode at excessive temperature.
- 13.2 Other information** : Handle and store batteries collected for disposal in line with the instructions of Section 7.

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: 6 of 8
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

**SECTION 14. TRANSPORT INFORMATION**

**14.1 Lithium ion battery (< 100 Wh)**

- Transport by road/railways (ADR/RID) : Lithium ion batteries are not subject to the ADR/RID requirements if they meet the requirements of special provision 188.
- Transport by sea (IMDG) : Lithium ion batteries are not subject to the IMDG requirements if they meet the requirements of special provision 188.
- Transport by air (IATA-DGR) : UN number: UN 3480  
Proper shipping name: LITHIUM ION BATTERIES  
Hazard class: 9
- Danger label(s) :



\* UN 3480  
\*\* Phone number for additional information

**14.2 Lithium ion battery (> 100 Wh)**

- Transport by road/railways (ADR/RID) : UN number: UN 3480  
Proper shipping name: LITHIUM ION BATTERIES  
Hazard class: 9  
Packaging group: II.  
Remark: Damaged or ineffective lithium batteries must follow the special provision 376. Lithium batteries carried for disposal or recycling must follow the special provision of 377. Furthermore lithium batteries have to follow the special conditions 230,310, 348 and 636
- Transport by sea (IMDG) : UN number: UN 3480  
Proper shipping name: LITHIUM ION BATTERIES  
Hazard class: 9.
- Transport by air (IATA-DGR) : UN number: UN 3480  
Proper shipping name: LITHIUM ION BATTERIES  
Hazard class: 9
- Danger label(s) :



**14.3 Lithium ion battery in equipment (< 100 Wh)**

- Transport by road/railways (ADR/RID) : Lithium ion batteries are not subject to the ADR/RID requirements if they meet the requirements of special provision 188.
- Transport by sea (IMDG) : Lithium ion batteries are not subject to the IMDG requirements if they meet the requirements of special provision 188.
- Transport by air (IATA-DGR) : UN number: UN 3481  
Proper shipping name: LITHIUM ION BATTERIES in equipment  
Hazard class: 9

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: 7 of 8
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

Danger label(s) :



\* UN 3481

\*\* Phone number for additional information

**14.4 Lithium ion battery in equipment (> 100 Wh)**

Transport by road/railways (ADR/RID) : UN number: UN 3481  
 Proper shipping name: LITHIUM ION BATTERIES in equipment  
 Hazard class: 9  
 Packaging group: II.  
 Remark: Damaged or ineffective lithium batteries must follow the special provision 376. Lithium batteries carried for disposal or recycling must follow the special provision of 377. Furthermore lithium batteries have to follow the special conditions 230,310, 348 and 636

Transport by sea (IMDG) : UN number: UN 3481  
 Proper shipping name: LITHIUM ION BATTERIES in equipment  
 Hazard class: 9.

Transport by air (IATA-DGR) : UN number: UN 3481  
 Proper shipping name: LITHIUM ION BATTERIES in equipment  
 Hazard class: 9

Danger label(s) :



**SECTION 15. REGULATORY INFORMATION**

**15.1 Labelling requirements**

In accordance with EU Battery Regulation and the respective National legislation, lithium ion batteries have to be marked by a crossed out dust bin, together with the ISO return/recycling symbol.



labelled

In addition, as a good industry practice, the lithium ion batteries are recommended to be with the hazard symbols described below.



No smoking, no open flames, no sparks



Corrosive



Wear safety goggles



Observe operating instructions



Keep away from children



Explosive gas mixture

The standard EN-IEC 6008-4 (2015) provides specific safety pictograms that could be considered but are not obligatory.

<b>SAFE HANDLING INSTRUCTIONS</b>	Page: <b>8 of 8</b>
<b>Lithium ion batteries</b>	Issue date: 25-2-2020
	Previous issue date: 1-9-2016

**SECTION 16. OTHER INFORMATION****16.1 Revision comments**

A line in the margin combined with text rendered in red indicates a relevant amendment from the previous version.

**16.2 Abbreviations and acronyms used**

Hazard statements (Section 3)

- : H225= Highly flammable liquid and vapour.
- H228= Flammable solid.
- H261= In contact with water releases flammable gases.
- H301= Toxic if swallowed.
- H302= Harmful if swallowed.
- H314= Causes severe skin burns and eye damage.
- H318= Causes serious eye damage.
- H319= Causes serious eye irritation.
- H372= Causes damage to organs through prolonged or repeated exposure
- H373= May cause damage to through prolonged or repeated exposure
- H400= Very toxic to aquatic life.
- H412= Harmful to aquatic life with long lasting effects.

**16.3 References and sources for data**

: Supplier information. Standard NEN-EC-IEC 6008-4 on Primary batteries - Part 4: Safety of lithium batteries (2015). ECHA public dossier information and the SER database

**16.4 Disclaimer**

Products such as Batteries do not require the publication of an EU Safety Data Sheet (REACH Art 31). The information given above is provided in good faith, is based on existing knowledge and does not constitute an assurance of safety under all conditions. It is the user's responsibility to observe all laws and regulations applicable for storage, use, maintenance or disposal of the product. If there are any queries, the supplier should be consulted.

**WAIVING OF LIABILITY:** However, the information is provided without any warranty - express or implied - regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense be rejected that in any way whatsoever, can result from handling, storage, use or disposal of the product. This safe handling instructions was prepared and is to be used for this product for the identified use only. If the product is used as a component in another product, it is possible that the information in this document is not applicable.

End of document