

1 Identification/Preparation/Company

1.1 Product name

CLF (Cyclic Lithium battery)

Company:

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2 Hazards identification

Under normal conditions of battery use, internal components will not present a health hazard. The following is provided for battery electrolyte for exposure that may occur during battery production or container breakage or under extreme heat conditions such as fire.

2.1 Risk and safety sentences:

(1) – Nature of special risks:

R14/15 Reacts with water and yields flammable gasses.
R21 Harmful in contact with skin.
R22 Harmful if swallowed.
R35 Causes severe burns.
R41 Risk of serious damage to the eye.
R42/43 May cause sensitization by inhalation and skin contact.
R43 May cause sensitization 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.

2.2 EU-GHS Classification:

Hazard statements:

H301 Toxic if swallowed
H312 Harmful in contact with skin
H315 Causes skin irritation..
H318 Causes serious eye damage
H332 Harmful if inhaled.

Precautionary statements:

- P102 Keep out of reach of children.
P222 Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P232 Protect from moisture
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P262 Do not get in eyes, on skin, or on clothing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P280 Wear protective gloves / protective clothing / eye protection / face protection.

3 Composition / information on ingredients

Principal Hazardous Component	% Wt.	CAS no.
Lithium iron phosphate	23 ~ 33	15365-14-7
ABS	5	-
Carbon	12 ~ 17	7440-44-0
Organic solvents: EC	3	
PC	3	
DEC	3	
LiPF ₆		21324-40-3

4 First aid measures

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 case, 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 sop 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.

5 Fire-fighting measures

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. LiPF₆ salt contained in the electrolyte releases hydrogen fluoride (HF) in contact with water.

5.1 Extinguishing media.

Suitable: CO₂,

Dry chemical or Foam extinguishers

Not to be used: Type D extinguishers

5.2 Special firefighting instructions.

If possible, remove cells from firefighting area. If heated above 125°C, cells can explode/vent.

5.3 Firefighting equipment

Use NIOSH/MSHA approved full face self-contained breathing apparatus (SCBA) with full protective gear.

6 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.

7 Handling and storage

The batteries should not be opened, destroyed nor incinerated since they may leak or rupture and release in the environment the ingredients they contain

7.1 Handling

Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods. 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.

7.2 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.

8 Exposure control/Personal protection

8.1 Engineering control

Keep away from heat and open flame. Store in a cool dry place.

8.2 Personal protection

Respirator: Not required during normal operations. SCBA required in the event of fire.

Eye/face protection: Not required beyond safety practices of employer.

Gloves: Not required for handling cells

Foot protection: Safety shoes recommended for large container handling.

9 Physical and chemical properties

Odor	Density	Melting Point (°C)	Solubility in H ₂ O	Gravity	Appearance
N/A	N/A	N/A	Not	N/A	Solid

10 Stability and reactivity**10.1 Reactivity**

None during normal operation or handling conditions.

10.2 Hazardous decomposition

Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium (LiPF₆) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

10.3 Incompatibilities

None during normal operations. Avoid exposure to heat, open flame and corrosives.

10.4 Conditions to avoid

Do not short terminals or immerse in water or pour.

Do not heat or throw in fire or solder.

Do not attempt to crush or drop.

Do not put in microwave oven, oven or pressure container.

Do not attempt to modify

11 Toxicological information

The Li-ion batteries do not contain toxic materials.

12 Ecological information

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

13 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.

14 Transport information

14.1 Clasification:

UN-number : UN 3480
Shipping name : Lithium-Ion Batteries
Class : 9
Packing Group : N/A

14.2 Air transport:

Personnel handling/preparing need to be trained according to the guidelines set out in the "IATA Dangerous Goods Regulations".

14.3 For Road Transport:

We recommend that personnel handling and preparing the goods for transport should have had sufficient training.

14.4 For Sea Transport:

We recommend that personnel handling and preparing the goods for transport should have had sufficient training.

14.5 For Rail Transport:

We recommend that personnel handling and preparing the goods for transport should have had sufficient training.

14.6 For River Transport:

We recommend that personnel handling and preparing the goods for transport should have had sufficient training.

Training requirements may diver from country to country, check with your national transport authority what training may be required.

14.7 Other:

Each cell and battery are of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3

15 Regulatory information



15.1 Signal word:

Danger

15.2 Hazard statements:

H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H332	Harmful if inhaled.

15.3 Precautionary statements:

P102	Keep out of reach of children.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire
P232	Protect from moisture
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P262	Do not get in eyes, on skin, or on clothing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P280	Wear protective gloves / protective clothing / eye protection / face protection.

16 Other information

16.1 Legal information

Legal Remark (U.S.A.)

Safety Data Sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". According to OSHA, Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees. Because all our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard.

Legal remark (EU)

These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. Instead, they must be regarded as "articles", no substances are intended to be released during handling. Therefore, there is no obligation to supply a "safety data sheet according to Regulation (EC) 1907/2006, Article 31".

General remark

This Safety Data Sheet is provided as a service to our customers. The details presented are in accordance with our present knowledge and experiences. They are no contractual assurances of product attributes.

Note

This information relates to the specific materials designated and may not be valid for such material used in combination with any other materials or in any process. It is the user's responsibility to Satisfy himself as to the suitability and completeness of this information for his particular use.

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