

Date: January 2011

Material Safety Data Sheet

(Originated from OSHA Hazard Communication Standard, 29CFR1910.1200)

1. Product Identification

Product Name: Lithium Thionyl Chloride Battery
(Li-SOCl₂, Non-Rechargeable 3.6V)

Chemical Reaction: 4Li + 2SOCl₂ → 4LiCl + S + SO₂

Models (IEC Standard)

-Small Size Battery XL-050F(ER14252), XLP-050F(ER14252), XL-055F(ER14335),
XLP-055F(ER14335), XL-060F(ER14505), XLP-060F(ER14505),
XL-100F(ER17500), XL-210F(ER33L65)

-Big Size Battery XL-140F(ER26500), XL-145F(ER26500), XL-200F(ER32L615),
XL-205F(ER32L615)

2. Composition/Information on Ingredients

NAME	CAS No	OSHA/NIOSH/ ACGIH TLV
Lithium Metal (Li)	7439-93-2	N/A
Thionyl Chloride(SOCl ₂)	7719-09-7	4.9 mg/m ³
Aluminum Chloride (AlCl ₃)	7446-70-0	2 mg/m ³
Lithium Chloride (LiCl)	7447-41-8	Not established
Carbon (C)	1333-86-4	3.5 mg/m ³

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3. Health Hazard Standard

Inhalation	No	Ingestion	No
Health Hazard	No	Skin	No

Signs or Symptoms of Exposure: Unless the electrolyte is exposure or rupture, there are no symptoms. When exposed to internal contents, corrosive fumes will be very irritating to skin, eyes, and mucous membranes. Continuous exposure can cause sign of non-fibrotic lung injury and membrane irritation.

Medical Conditions Generally Aggravated by Exposure: There may occur eczema, skin allergies, lung injuries, asthma, and other respiratory disorders when exposed.

4. Emergency First Aid Procedures

Eye Contact: Flush with Running Water for at Least 15 Minutes. Hold eyelids apart. Seek immediate treatment.

Skin Contact: Rinse with plenty of running water. If burns develop, seek medical treatment.

Inhalation: Remove to fresh air. If necessary, administer oxygen and seek medical treatment.

Ingestion: Find immediate medical treatment.

5. Fire and Explosion Hazard Standard

Flash Point	N/A	Flammable Limits	N/A
Auto ignition	N/A	ExtinguisherMedia	Lith-X or other metal (Class D) fire extinguishers

Fire and Explosion Condition: Continuously exposed to above 100°C (212°F) caused by abnormal environmental condition. Drop contents of lithium metal to water.

Special Fire Fighting Procedures: Do not use water, sand, carbon dioxide, or soda ash extinguisher. Wear protective breathing apparatus and protective garments.

Unusual Fire and Explosion Hazards: Do not short circuit, recharge, over-discharge, puncture, incinerate, crush or expose to temperature above the temperature rate of the battery.

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6. Accidental Release Measures

None under normal use conditions. If contents leak, observe the following instructions
Protection for person Use full protective equipment to avoid breathing vapors or touching liquid.
Removing procedure Put the leaked battery into large container or plastic bag filled with sand or water including NaCl₂(Salt) or CaCO₃(Limestone) or CaO(Quicklime).
Rinse the leaked liquid with water afterwards.
Area Evacuate the area except for operators. After above procedures, ventilate the contaminated area.

7. Precautions For Safe Handling and Storage

Working Steps when Material is Spilled or Released: Do not breathe vapors nor touch liquid with bare hands.

Waste Disposal Method: Neutralize spill with soda lime, seal leaking battery and soda lime in plastic bag and dispose of as hazardous waste.

Precautions in Handling and Storage: Do not short circuit or expose to temperature rates of the battery. Do not recharge, over-discharge, puncture, or crush.

Other Precaution and/or Special Hazards: Do not store batteries in high humidity and environment for long periods because such condition can cause higher self-discharge.

8. Control Standard

Respiratory Protection: As any fire situation is happened, use self-contained breathing apparatus if a cell vent or fire occurs.

Eye Protection: Safety glass are recommended

Protective Gloves: In case of leakage, wear gloves.

Other Protective Clothing: In the event of leakage, wear chemical apron.

Ventilation:

Local Exhaust: Yes

Medical: N/A

Special: N/A

Other: N/A

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9. Physical Characteristics

Melting Point	N/A	Boiling point	N/A
Vapor Pressure	N/A	Specific Gravity	N/A
Vapor Density	N/A	Solubility in Water	N/A
Odor	If leaked, sharp, pungent odor		
Appearance	Cylindrical type		
Water reaction	When open by force, the ingredients hydrolyzed to form SO ₂ and HCl upon contact with water.		

10. Reactivity Standard

Stability: Stable (hermetically sealed type, used in recommended conditions)

Condition to Avoid: Give too much force, drop, crush & disassemble, short-circuit, recharge, fire & heat above 100 °C (212 °F), incinerate and etc.

Incompatibility: Do not expose internal contents to water

Hazardous Decomposition Products: SO₂, HCl, LiOH and H₂

Hazardous Polymerization: Will not occur.

11. Toxicological Information

N/A

12. Ecological Information

The batteries do not contain Mercury, Cadmium or other heavy metals.

13. Disposal

Different to the policy of each country. Normally, it is not allowed to throw away.

- Proper Shipping Name: Used Lithium Batteries
- UN Number: UN3090
- Hazard Classification: Class 9(Miscellaneous)
- Packing Group : II
- Labels Required: Miscellaneous Hazardous Waste
- Disposal Code: D003
- Other: All lithium thionyl chloride batteries should be disposed of by a proper disposal facility.

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14. Transportation

Class 9

UN 3090: LITHIUM METAL BATTERIES
UN 3091: LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT, or
LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT

Packing group: II

Special provisions and packing instructions:

ADR, RID: 188, 230, 310, 636, P903, P903a, P903b
IATA: A88, A99, A154, A164, P968, P969, P970
IMDG-Code: 188, 230, 310, P903
EmS: F-A, S-I
Storage and segregation: Category A

Exemptions

Lithium metal batteries are dangerous goods, UN No.3090. Therefore they are generally subject to transport regulations, depending on the transport mode. However, most Xeno Lithium Batteries listed in the product data catalogue are exempted from the regulations if the following conditions are given:

- A.** The batteries have not more than 2g lithium content, each cell not more than 1g lithium content.
- B.** The batteries have passed the UN tests.
- C.** The batteries shall be packed in inner packaging that completely enclose them. They shall be protected so as to prevent short circuits.
- D.** The package and the shipping documents are marked with a notice indicating that it contains lithium batteries and shall –if damaged- be quarantined, inspected and repacked.
- E.** The gross mass dose not exceed 35kg per package(2.5Kg for passenger craft)
- F.** The packing shall be strong and capable of withstanding a 1.2m drop test.
- G.** For more conditions see special provision 188 (**ADR/RID/IMDG-Code**) and section 2 of packing instructions 968-970 (**IATA DGR**)

- XenoEnergy lithium batteries meet the requirement of each test in the UN Manual Tests and Criteria (8 tests), Part III, subjection 38-3 through the approval of UL tests (the most reliable US safety requirement) including Altitude, Temperature, Vibration, Shock, Internal Short Circuit, Impact, Overdischarge and Forced discharge.

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Conclusion (Delivery of Xeno Batteries)

By Air (IATA 2011, US DOT)

Only cargo aircraft
Under 2.5kg or 35kg per package

By Road / Rail (ADR2009)

Under 30 kg per package

By Sea (IMDG code 2002)

Under 30 kg per package

15. Regulatory Information

N/A

16. Other Information

For further information, please contact to XenoEnergy Co., Ltd.

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