

AUG, 2011

Material Safety Data Sheet

1. Product Identification

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

Chemical Reaction: 4Li + 2SOCl₂ ----> 4LiCl + S + SO₂

Emergency Telephone No. CHEMTREC: 800-424-9300

INTERNATIONAL: 703-527-3887

Models: LTC-3PN, LTC-7PN, LTC-7P, LTC-7PMP, LTC-7PMS, LTC-16M, LTC-16P, LTC-9C, LTC-17C, LTC-12P, PT-2150, PT-2175, PT-2100, PT-1750, PT-2200, PT-2300, HP-5134, HP-5135, PT-5150, PT-5100

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

2. Physical Identification

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 leak, 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.		

3. 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.

4. Health Hazard Standard

Inhalation	No	Ingestion	No
Health Hazard	No	Skin	No

Signs or Symptoms of Exposure: Unless the electrolyte is exposed or ruptured, 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: Conditions include eczema, skin allergies, lung injuries, asthma and other respiratory disorders.

5. 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.

Ingestion: Find immediate medical treatment.

6. Fire and Explosion Hazard Standard

Flash Point	N/A	Flammable Limits	N/A
Auto Ignition	N/A	Extinguisher Media	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.

7. Precautions for Safe Handling and Use

Working Steps when Material is Spilled or Released: Do not breathe vapors or 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 Hazard: Do not store batteries in high humidity and environment for long periods because such conditions can cause higher self-discharge.

8. Control Standard

Respiratory Protection: Use self-contained breathing apparatus if a cell vent or fire occurs.

Eye Protection: Safety glasses are recommended.

Protective Gloves: In case of leakage, wear gloves.

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

Ventilation:

Local Exhaust: Yes Medical: N/A

Special: N/A Other: N/A

9. Transportation

US DOT (per 49 CFR 172.101) and IATA/ICAO, IMDG

Proper Shipping Name: Lithium Metal Batteries

UN Numbers: UN3090 and (UN3091 for Lithium Metal Batteries contained in or packed with equipment)

Hazardous Class: Class 9 (Misc.)

Packing Group II

Lithium Battery Label (IATA) 7.4.8

CARGO AIRCRAFT ONLY (Forbidden aboard passenger aircraft)

DOT: Lithium metal batteries and cells are subject to shipping requirements exceptions under 49 CFR 173.185.

IATA: Shipping of lithium batteries as required in Special Provisions A48, A88, A99, A154, and A164 and Packing Instructions 968, 969, or 970, Section II.

IMDG CODE: 188,230,310, P903.

EXEMPTIONS

Lithium batteries are regarded as dangerous goods based on the above stated regulations when delivered via air, sea, road and train. Lithium cells and batteries offered for transport are not subject to other provisions of these regulations if they meet the following:

- A) For lithium metal or lithium alloy cell, the lithium content is not more than 1g
- B) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2g
- C) Each cell or battery is of a type proved to the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38-3
- D) Cells and batteries are separated so as to prevent short circuits and are packaged in strong packages, except when installed in equipment.
- E) The package and shipping documents are marked indicating that it contains lithium batteries.

Small Keeper lithium metal batteries meet above Special Provisions.

Medium Keeper lithium metal batteries do not meet the above Special Provisions, special package is necessary based on packaging group II.

EaglePicher lithium batteries meet the requirement of each test in the UN Manual Tests and Criteria (8 tests), Part III, subsection 38-3

Through the approval of UL tests (the most reliable US safety requirement) including Altitude, Temperature, Vibration, Shock, Internal Short Circuit and Impact.

10. Disposal

Different to the policy of each country. Normally it is not allowed to be thrown away.

- Proper Shipping Name: Waste 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.

EaglePicher Technologies
Commercial Power Solutions
3220 Industrial Rd., Joplin, MO 64804
Tel. 417-625-1116 Fax 417-626-2078