The information contained within is provided as a service to our customers and for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. BiPOWER makes no warranty expressed or implied, and disclaims all liabilities from reliance on it.

Section I – Identification

1.1 Product

Product Name and Description: Lithium Thionyl Chloride (Li-SOCl₂), Non-rechargeable, Non-venting batteries.

1.2 Supplier

Address (Number, Street, City, State and Zip Code) BiPOWER CORP. 1831 West Garvey Ave. Suite 15 Alhambra, CA 91803

Telephone Numbers For Information

Telephone: (626) 457-8966 Fax: (626) 576-7766 Emergency Telephone: (626) 457-8966 Date of Revision: 01-25-2005

Section II – Hazardous Ingredients

CHEMICAL NAME	CAS NUMBER	%	OSHA (PEL)	ACGIH (TLV)
Lithium Metal (Li)	7439-93-2	< 5%	None	N/A
Thionyl Chloride (SOCI2)	7719-09-7	< 47%	5 mg/m3	5 mg/m ³
Carbon (C)	1333-86-4	< 6%	3.5 mg/m3	3.5 mg/m ³
Aluminum Chloride (AlCl ₃)	7446-70-8	< 5%	N/A	2 mg/m ³

Section III — Physical/Chemical Characteristics

Melting Point:	N/A	Vapor Pressure (mm Hg):	N/A	Specific Gravity (H2O=1):	N/A
Boiling Point:	N/A	Evaporation Rate:	N/A	Solubility in Water:	N/A
Volatile by Volume %:	N/A	Vapor Density (Air=1):	N/A	Appearance and Odor:	N/A

Section IV - Fire and Explosion Hazard Data

Flash Point	N/A	Lower Explosive Limit	N/A	Unner Explosive Limit	N/A
FIASH FUILL.		LOWER EXPLOSIVE LIMIT.			11/7

Extinguishing Media:

CO₂ extinguishers or copious quantities of water or water-based foam can be used to cool down burning Li-SOCl₂ cells and batteries, as long as the extent of the fire has not progressed to the point that the lithium metal they contain is exposed.

Do not use for this purpose sand, dry powder or soda ash, graphite powder or fire blankets. Use only Lith-X (Class D) extinguishers on fire involving raw lithium.

Special Fire Fighting Procedures:

Use self contained breathing apparatus and full protective equipment.

Unusual Fire and Explosion Hazardous:

Do not recharge, disassemble, heat above 125 °C (257 °F), incinerate or expose contents to water. Vent, rupture or explosion may result and cause severe burns.

Section V - Health Hazard Data

Do not short circuit, recharge, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. Risk of fire or explosion. The Lithium Thionyl Chloride batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer.

Under normal conditions of use, the electrode materials and liquid electrolyte they contain are not exposed to the outside, provided the battery integrity is maintained and seals remain intact. Risk of exposure only in case of abuse (mechanical, thermal, electrical) which leads to the activation of rupture of the battery containers. Electrolyte leakage, electrode materials reaction with moisture/water or battery vent/explosion/fire may follow, depending upon the circumstances.

Route(s) of Entry: Eyes	Inhalation: Yes	Skins: Yes	Ingestion: Yes	
Health Hazards (Acute and Chronic):	SOCI2 - Will burn and irri inhalation of fumes may	tate eyes & skin. cause lung dam	. Upper respiratory irritant. Continuous age.	
Carcinogenicity NTP: N/A	IARC Monographs: N/A		OSHA Regulated: N/A	
Signs and Symptoms of Exposure:	SOC12 - Eye and skin irritation, pungent odor and respiratory irritation.			
Medical Conditions Generally Aggrav	vated by Exposure: N/A			

Emergency and First Aid Procedures:

If free (S0Cl₂) is present, evacuate areas and provide ventilation, wash exposed area with soda ash or sodium bicarbonate solution. Seek medical attention.

Inhalation:	Remove from exposure, rest and keep warm. In severe cases obtain medical attention.
Skin contact:	Wash off skin thoroughly with water. Remove contaminated clothing and wash before reuse. In severe cases obtain medical attention.
Eye contact:	Irrigate thoroughly with water for at least 15 minutes. Obtain medical attention.
Ingestion:	Wash out mouth thoroughly with water and give plenty of water to drink. Obtain medical attention.
Further treatment:	All cases of eye contamination, persistent skin irritation and casualties who have swallowed this substance or been affected by breathing its vaporous should be seen by a Doctor.

Section VI - Reactivity Data

Stability: The batteries are stable under normal operating conditions.

Hazardous Polymerization: will not occur.

Hazardous decomposition products:

Hydrogen (H₂) as well as Lithium oxide (Li₂O) and Lithium hydroxide (LiOH) dust Is produced in case of reaction of *lithium metal* with water. Chlorine (Cl₂), Sulfur dioxide (SO₂) and Disulfur dichloride (S₂Cl₂) are produced in case of thermal decomposition of thionyl chloride above 140°C. Hydrochloric acid (HCI) and Sulfur dioxide (SO₂) are produced in case of reaction of Thionyl chloride with water at room temperature. Hydrochloric acid (HCI) fumes, Lithium oxide, (Li₂O), Lithium hydroxide (LiOH) and Aluminum hydroxide (AI(OH)₃) dust are produced in case of reaction of Lithium tetrachloroaluminate (LiAICl₄) with water.

Conditions to avoid: Heat, open flames, water and moisture and temperature above 140 °C (284 °F)

Materials to avoid: Oxidizing agents, alkalis, water. Avoid electrolyte contact with aluminum or zinc.

Section VII - Spill and Leak Procedures

The material contained within the battery would only be released under abusive conditions. In the event of battery rapture and leakage: contain the spill while wearing proper protective clothing and ventilate the area. Then, cover with sodium carbonate (Na₂CO₃) or 1:1 mixture of soda ash and slaked slime. Keep away from water, rain, and snow. Placed in approved container (after cooling if necessary) and disposed according to the local regulations.

Section VIII - Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled: Avoid contact if vent rupture or explosion has occurred. Protect from heat, short circuit of terminals, and an accumulation of shorted batteries, which may cause dangerous elevated temperatures.

Waste Disposal Method: Dispose of waste according to federal EPA, state and local regulations.

Precautions to be taken in Handling and Storing: Do not short circuit, heat above 125°C (257°F), recharge, disassemble, incinerate or expose to water.

Section IX- Precautions for Safe Handling and Use

Storage: Store preferably in cool (below 30°C (90°F)), dry and ventilated area, which is subject to little temperature change. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in shortened battery life and degrade performance. Do not store batteries in high humidity environment for long periods.
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.

Section X - Recycling and Disposal

- 1. Waste disposal must be in accordance with the applicable regulations.
- 2. Disposal of the Lithium batteries should be performed by permitted, professional firms knowledgeable in Federal, State or Local requirements of hazardous waste treatment and hazardous waste transportation.
- Incineration should never be performed by battery users, but eventually by trained professional in authorized facility with proper gas and fume treatment.
- 4. Recycling of battery can be done in authorized facility, through licensed waste carrier.

Section XI - Transportation

Lithium batteries UN number 3090, class 9 (miscellaneous) Lithium batteries contained in equipment, UN number 3091, class 9 (miscellaneous). Packing class- ICAO 903 for air transport IMDG 9033 for sea transport ADR for road transport RID for rail transport The United States transportation Code of Federal Regulations (CFR 49 Chapter 1, paragraph 173.185) Use Lithium Batteries label for transportation. Those Lithium cells are prohibited for transport aboard passenger aircraft. Otherwise, they can be shipped via any carrier provided that they are separated to prevent short-circuit and to prevent movements that could lead to short-circuit under all conditions encountered during transportation. In addition, the batteries must also be packed in strong packaging that withstands the conditions normal to transportation.