

Material Safety Data Sheet
Lithium Thionyl Chloride Battery

The information and recommendations below are believed to be accurate at the date of preparation. GlobTek, Inc. makes no warranty of merchantability or any other warranty, express or implied, with respect to such information and we assume no liability resulting from its use. This MSDS sheet provides guidelines for safe use and handling of the product. It does not and cannot advise all possible situations. Your specific use of this product should be evaluated to determine if additional precautions must be taken.

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SECTION 1 – IDENTITY

Product Name Primary (non-rechargeable) Lithium metal Thionyl Chloride (Li/SOCl₂) cells and batteries, Non-rechargeable.

Common Synonyms

Primary (non-rechargeable) Lithium metal Thionyl Chloride (Li/SOCl₂) cells and batteries, Non-rechargeable.

DOT Description

Primary (non-rechargeable) Lithium metal Thionyl Chloride (Li/SOCl₂) cells and batteries, Non-rechargeable.

Chemical Name Lithium Thionyl Chloride Battery

SECTION 2 – Composition/Information on Ingredient

Chemical Name	Molecular Formula	CAS No.	Weight (%)
Lithium	Li	7239-93-2	3.5-5.0
Carbon	C	7782-42-5	3.0-4.0
Tetrafluoroethylene	(C ₂ F ₄) _n	9002-84-0	N/A
Thionyl Chloride	SOCl ₂	7719-09-7	40-45
Aluminum Chloride	AlCl ₃	7446-70-0	1-5
Lithium Chloride	CLi	7447-41-8	N/A
Stainless steel	N/A	N/A	N/A
Glass	Na ₂ O.CaO.6SiO ₂	N/A	N/A
Nickel	Ni	7440-02-0	N/A
Vinyl Chloride	(C ₂ H ₃ Cl) _n	9002-86-2	N/A

Abbreviation: CAS No. is Chemical Abstract Service Registry Number.

SECTION 3 – HAZARDS IDENTIFICATION
Invasion route:

Skin contact: Contact with battery electrolyte may cause burns and skin irritation.

Eyes contact: Contact with battery electrolyte may cause burns. Eye damage is possible.

Inhalation: Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.

Ingestion: Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.

Health hazards:

The chemical are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused.

Environment hazards:

Don't abandon the battery into environment.

Burn & burst danger:

Do not dispose of battery in fire and recharge battery-may explode. Do not short-circuit battery-may cause burns.

SECTION 4 – First Aid Measures

Eye

If the battery is leaking and the contained material contact the eyes, flush the eyes with plenty of water or saline water at least 15 minutes, get medical aid at once.

Skin

If the battery is leaking and the contained material contact the skin, remove contaminated clothes quickly and rinse the skin with plenty of water at least 15minutes, if irritation or pain persist, get medical aid at once

Inhalation

If the battery is leaking, remove to fresh air immediately, keep the respiratory tract smooth. Use oxygen if available. Get medical aid.

Ingestion

If the battery is leaking and the contained material is ingest, rinse mouth and surrounding area with clear water at once. Get medical at once.

SECTION 5 – Fire Fighting Measures

Danger characteristic:

Exposure to excessive heat can cause venting of the liquid electrolyte. Battery may burst and release hazardous decomposition products when exposed to a fire situation.

Hazardous combustion products:

CO, CO₂, metal oxides ,irritating fumes

Fire-Fighting method& media

The stuff must equip with filtermask (full mask) or isolated breathing apparatus. The stuff must wear the clothes which can defense the fire in the upwind direction. Remove the container to the open space as soon as possible .Spray water on the containers in the fireplace to keep them cool until finish extinguishment Media: hazy water, foam power, co₂, sandy clay.

SECTION 6 – SPILL OR LEAKAGE PROCEDURES

Emergency treatment:

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the batteries to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate waste.

SECTION 7 – Handling and Storage

Handling:

1. Do not allow battery terminates to contact each other, or contact with other metals.
 2. Pack batteries in separate plastic bags so that the single batteries are not mixed together.
 3. Do not expose the battery to excessive physical shock or vibration.
 - 4 Do not immerse, throw, and wet a battery in water.
 - 5 Short-circuiting should be avoided. Short circuit will reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short- circuited battery can cause skin burn.
 6. The batteries should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container.
 7. Place the cell beyond the child packing and container.
 8. Never apply battery into a airtight compartment or sealed container.
 9. Be sure to use the specified charger for battery, and follow the charging instructions correctly.
 10. Do not mix old and new batteries together, neither with Ni-Cd, dry batteries or another manufacturer batteries or product.
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Storage:

1. Batteries should be separated from other materials and stored in a noncombustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks.
 2. Keep the sample in the cool, dry and well-ventilated place. Do not exposure to direct sunlight for long periods. Keep away from fire and heating sources. Don't keep the samples with oxidizer and acid.
 3. Keep batteries in original package until use and do not jumble them.
 4. Equip with relevant types and quantities of the extinguishment instruments. The storage place should be equipped with suitable shelter materials for divulgence handling
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SECTION 8 – Exposure Controls, Personal Protection

Maximum admissible concentration: No standard yet

Monitoring Method: /

Engineering Control: Keep away from heat and open flame. Supply with sufficient partial air exhaust. Store in a cool, dry place

Respiratory Protection:

Not necessary under conditions of normal use. Wear self-contained breathing filtermask if the density exceed in the air. Wear breathing apparatus under the condition of emergency rescue or evacuation.

Eyes Protection:

Not necessary under conditions of normal use. Wear protective glasses if handling a leaking or ruptured battery.

Body Protection:

Not necessary under conditions of normal use. Wear fireproofing, gas defense clothes in case of handling a leaking or ruptured battery

Hands Protection:

Not necessary under conditions of normal use. Wear chemical resistant rubber

Other Protections:

No smoking, dining and drinking water in the workplace. Keep good habit of hygiene.respiratory and eye irritation.

SECTION 9 – Physical Data

Appearance: cycle. Cylinder

Odor: Odorless

Flash Point: No specific data.

Boiling Point: No specific data.

Melting Point: No specific data.

Proportion: No specific data.

Acid Value: No specific data

PH Value: No specific data.

Density: No specific data.

Permission of solvent inhalation: No specific data.

Ignition temperature: No specific data.

Solubility: Insoluble in water

SECTION 10 – Stability and Reactivity

Stability: Stable under normal temperature and pressure.

Distribution of Ban: strong oxidizer, strong acid and corrosives

Conditions to Avoid: Fire source, heating source, disassemble, short circuit, immerse in water or overcharge.

Hazardous Polymerization: No specific data.

Hazardous Decomposition Products: The battery may release irritative gas once the electrolyte leakage.

SECTION 11 – Toxicological Information

Acute Toxicity: No information is available.

Sub-acute and Chronic Toxicity: No information is available.

Irritation: The liquid in the battery may irritate eyes and skin with any contact.

Sensitization: The liquid in the battery may cause sensitization to some person.

Mutagenicity: No information is available.

Carcinogenicity: No information is available.

Others: Since the materials in this battery are sealed in the can, the potential for exposure to the components of the battery is negligible, when the battery is used as directed. However technical or electrical abuse of the battery may result in the release of battery contents.

SECTION 12 – Ecological Information

Eco-toxicity: No information is available.

Biodegradable: No information is available.

Non-biodegradable: No information is available.

Bioconcentration or biological accumulation: No information is available.

Other harmful effects: Don't abandon the battery into environment, may cause water or soil pollution.

SECTION 13 – Disposal Considerations

Waste disposal methods: Refer to National or Local regulations before handling. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in National or Local regulations of hazardous waste treatment and hazardous waste transportation. Attention abandoned: the battery should be completely discharged prior to disposal in order to prevent short circuit. The battery contains recyclable materials. It is suggested recycle

SECTION 14 – Transport/Shipping

Number of dangerous goods: /

UN Number: 3090/3091

Packaging Mark: /

Packaging Method: /

Transport Attention: According to PACKING INSTRUCTION 968 ~ 970 of IATA DGR 57th Edition for transportation, the special provision 188 of IMDG (inc Amdt 35-10). The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are integrate and tighten closed before transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain. The transport vehicle and ship must be cleaned and sterilized otherwise it is not allowed to assemble articles. During transport, the vehicle should prevent exposure, rain and high temperature. For stop over, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area.

SECTION 15 – Regulatory Information

Law Information

ISO 11014-2009: Safety data sheet for chemical products - Content and order of sections.

Regulation (EC) No 1272/2008: Classification, Labeling and Packaging of Substances and Mixtures.

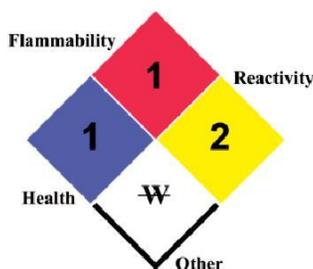
International Air Transport Association (IATA) Dangerous Goods Regulations, 57th Edition

The International Maritime Dangerous Goods (IMDG) Code (inc Amdt 35-10)

SECTION 16 – Additional Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier, nor any its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist



Assembly of battery packs:

The design and assembly of battery packs require special skills, expertise and experience. Therefore it is not recommended that the end user will attempt to self-assemble battery packs. It is preferable that any battery using lithium cells will be assembled by GlobTek to ensure proper battery design and construction. A full assembly service is available from GlobTek who can be contact for further information. If for any reason, this is not possible, GlobTek can review the pack design in confidential to ensure that the design is safe and capable of meeting the stated performance requirements.