

Safety Data Sheet

1. Identification of Product and Company

1) Product Name

Primary Lithium Thionyl (or Sulfuryl) Chloride Cells and Batteries (Li-SOCl₂ or Li-SO₂Cl₂) including CLE and CLH series.

Model: CLE-03, CLE-04, CLE-06, CLE-10, CLE-14, CLE-20, CLE-209, CLH-14, CLH-20

2) Manufacturer Name: COROS Battery Co., Ltd.

1104, Choongang Royal Office, 13, Seoun-ro, Seocho-gu, Seoul, Korea, 06732

3) Emergency Contact

International: +82-2-588-4008

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2. Composition and Information on Ingredient

Ingredient	CAS No.	Contents (%)	ACGIH (TLV)	OHSA (PEL)
Lithium Metal (Li)	7439-93-2	3.0-5.0%	Not Established	None
Carbon (C)	1333-86-4	3.0~6.0%	3.5 mg/m ³	3.5 mg/m ³
Thionyl Chloride (SOCl ₂)	7719-09-07	33.0~47.0%	1ppm (5 mg/m ³)	5 mg/m ³
Lithium Chloride (LiCl)	7447-41-8	1.0~2.0%	Not Established	
Aluminum Chloride (AlCl ₃)	7446-70-0	4.0~6.0%	2.0 mg/m ³ (Al salt, soluble)	
Steel, Nickel and Inert components		Balance		

3. Hazard Identification

The Lithium Thionyl Chloride Batteries have hermetically sealed structure, so they are not hazardous when they are used in the recommendations of the manufacturer.

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.

Under normal usage conditions, the electrode materials and liquid electrolyte cannot be leaked to the outside. Risk of exposure only in case of abuse (mechanical, thermal, electrical) which leads to the rupture of the battery container.

Electrolyte is toxic and corrosive and causes irritation, skin burn, lung injuries, asthma and other respiratory disorders

4. First Aid Measures

Eye Contact: Flush eye with plenty of water for at least 15 minutes. Seek medical attention.

Skin Contact: Flush skin with plenty of running water for at least 15 minutes. Seek medical attention.

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

Ingestion: Wash mouth with plenty of water and drink plenty of water. Seek medical attention

5. Fire Fighting Measures

Lith-X (Class D extinguishing media) is the only extinguishing media on fires involving a few lithium batteries. If cells are already catching a fire, do not use Water, Sand, CO₂, Halon and Dry Powder or Soda Ash Extinguishers.

Once the fire is in nearby area and the fire is not progressed, CO₂ Extinguishers or copious amounts of cold water can be effective extinguishing media to cool down burning Li-SOCl₂ cells and batteries.

6. Accidental Release Measures

Under abusive conditions, the battery contained materials may leak.

Put the leaked batteries into small container or plastic bag adding the neutralizing agents of Sodium carbonate (Na₂CO₃), chalk (CaCO₃) or lime (CaO) powder.

Precaution for handling: Store batteries in dry and cool area and keep container dry and tightly closed in ventilated area to avoid short circuit, over-charge and heating.

7. Handling and Storage

Handling: Do not crush, puncture or short circuit. Do not directly heat or solder, over charge the battery or forced discharge. Do not throw into fire.

Storage: Store in a cool (below 30°C) and ventilated area with less temperature and moisture effect. Do not place near heating equipment or direct sunlight for a long time. Keep the batteries in original battery package.

Others: Lithium Thionyl Chloride batteries are not rechargeable batteries and should not be charged. Avoid the deformation of batteries by pressure. Keep the recommended usage conditions and temperatures by the manufacturer.

8. Exposure Controls and Personal Protection

Respiratory Protection: As any fire situation is happened, use self-contained breathing apparatus.

Eye Protection: Safety glasses are recommended.

Protective Gloves: In case of leakage, wear gloves.

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

9. Physical and Chemical Properties

Melting Point	N/A	Boiling Point	N/A
Vapor Pressure	N/A	Specific Gravity	N/A
Vapor Density	N/A	Physical State	Solid
Solubility in Water	N/A	PH	N/A
Appearance	Geometric Solid Object		
Odor	If leaked, giving off pungent corrosive odor		

10. Stability and Reactivity

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.

Material to Avoid: Alkali, water, mineral acid

Hazardous Decomposition Products:

* Reaction of lithium metal with water: Hydrogen (H₂) / Lithium oxide (Li₂O) and Lithium hydroxide (LiOH)

* Thermal decomposition over 150°C: Hydrochloric acid (HCl) and Sulfur dioxide (SO₂)

* Electrolyte (Lithium tetrachloroaluminate, LiAlCl₄) with water: Hydrochloric acid (HCl) fumes, Lithium oxide (Li₂O), Lithium hydroxide (LiOH) and Aluminum hydroxide (Al(OH)₃)

11. Toxicological Information

Not Applicable

In the event of rupture or leakage, corrosive fumes from the battery can cause

Inhalation: Burn or irritation of the respiratory system

Eye Contact: Redness, tearing, burns

Skin: Skin irritation and burns

Ingestion: Tissue damage to throat and gastro-respiratory track

Medical conditions generally aggravated by exposure: eczema, skin allergies, lung injuries, asthma and other respiratory disorders may occur.

12. Ecological Information

1) Lithium Thionyl Chloride batteries do not have environmental hazard under normal usage and proper disposal.

2) Lithium Thionyl Chloride batteries do not contain mercury, cadmium or other heavy metals.

13. Disposal

- 1) Dispose under the regulation in each country.
- 2) Dispose by incineration or burial at permitted waste treatment and disposal sites

14. Transportation

- 1) Product Category: Lithium Metal Batteries (with All UN Test Approval)
- 2) UN ID No. UN3090 or UN3091
UN 3090: Lithium Metal Batteries
UN 3091: Lithium Metal Batteries Contained in Equipment, or
Lithium Metal Batteries Packed with Equipment

- **Lithium metal cells and batteries are considered as Dangerous Goods with UN3090 and UN3091.**
- **Depending on their lithium metal contents, some cells or batteries may be regarded as non-dangerous goods without Class 9 nomination.**

- 3) Regulation

A. Air Transportation: IATA 64th Edition 2023, Dangerous Goods Regulations

- All cells and batteries shall be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3 (DGR 3.9.2.6).

Small Size Battery (less 0.3g, 8cells): Lithium Contents Cells ≤1g / Batteries ≤2g (CLE-03)

→ Packing Instruction 968 Section II

- No Passenger Cargo, Cargo Aircraft Only, No Overpack and Pallet Packing
- Package cells ≤1g = Net 2.5kg // cells >0.3≤1g = 8cells // batteries >0.3≤2g = 2cells
- Label: Lithium Battery Mark, Cargo Aircraft Only label
- Not more than one package prepared in accordance with this section may be placed into an over pack
- Pallet packing do not allow, only pack
- Use IB if Package exceeds Section II limits and more than 1 package

Small Size Battery: Lithium Contents (over 8cells) Cells ≤1g / Batteries ≤2g (CLE-03, CLE-04, CLE-06, CLE-10)

→ Packing Instruction 968 Section IB

- No Passenger Cargo, Cargo Aircraft Only
- Package \leq Net 2.5kg (or $<$ 35kg in DG label & package)
- Label: Lithium Battery Mark, Lithium battery Class 9 label, Cargo Aircraft Only label
- DG Declaration

Big Size Battery: Lithium Contents Cells $>$ 1g / Batteries $>$ 2g

(CLE-14, CLE-20, CLE-209, CLH-14, CLH-20)

→ Package instruction 968 Section IA

- No Passenger Cargo, Cargo Aircraft Only
- Package \leq 35kg
- Label – Lithium battery Class 9 Label, Cargo Aircraft Only label
- DG Declaration & Certification

B. Sea Transportation: IMDG – Code 2018

Small Size Battery: Lithium Contents Cells \leq 1g

(CLE-03, CLE-04, CLE-06, CLE-10)

→ Special Provision 188 (Exception)

- Lithium Metal cells $<$ 1g, batteries $<$ 2g – Not subject to Class 9 (Non-DG)
- Packing Group I
- Each cell or battery is of the type proved to meet the requirements of each test of the Manual Tests and Criteria Part III, sub section 38.3.Cells and batteries manufactured.

Big Size Battery: Lithium Contents Cells $>$ 1g

(CLE-14, CLE-20, CLE-209, CLH-14, CLH-20)

→ Class 9 / Packing Group II

C. Road or Rail Transportation: ADR / RID 2015

Small Size Battery: Lithium Contents Cells \leq 1g

(CLE-03, CLE-04, CLE-06, CLE-10)

→ Special Provision 188 (Exception)

- Lithium Metal cells $<$ 1g, batteries $<$ 2g – Not subject to Class 9 (Non-DG)
- Packing Group I
- Each cell or battery is of the type proved to meet the requirements of each test of the Manual Tests and Criteria Part III, sub section 38.3.Cells and batteries manufactured.

Big Size Battery: Lithium Contents Cells $>$ 1g

(CLE-14, CLE-20, CLE-209, CLH-14, CLH-20)

→ Class 9 / Packing Group II

15. Regulatory Information

- 1) All the cells and batteries are exempted from the requirements of the Hazard Communication Standard.
- 2) Lithium batteries are not included in the NFPA material list under hermetical sealing.
- 3) The internal material (Thionyl chloride) is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1920 1200
- 4) Internal material Lithium metal and $AlCl_3$ are high danger of harmful materials.

16. Other Information

For additional information, please contact to COROS Battery Co., Ltd.