

Material Safety Data Sheet

Section 1 - Product and Company Identification

Product Identifier: Lithium Thionyl Chloride Battery(Li/SOCl₂)

Cell Model: ER321250MR-145

Manufacturer: EVE Energy Co., Ltd.

Address: EVE Industrial Park, Xikeng Industrial Zone, Huihuan Town, Huizhou, Guangdong, China.

Post Code: 516006

Tel: +86-752-2606966

Fax: 0752-2606033

Section 2 – Composition/Information on Ingredient

Material	Formula	CAS#	% wt.
Lithium	Li	7439-93-2	<5%
Thionyl Chloride	SOCl ₂	108-32-7	<47%
Carbon	C	1333-86-4	<6%
Aluminum Chloride	AlCl ₃	7446-70-0	<5%
Lithium Chloride	LiCl	7447-41-8	<2%
PTFE	—	9002-84-0	<1%
Epoxy resin	—	38891-59-7	<1%

Section 3 - Hazards Identification

■ Health Hazards (Acute and Chronic)

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. Contact of electrolyte and extruded lithium with skin and eyes should be avoided.

■ Sign/Symptoms of Exposure

A shorted battery can cause thermal and chemical burns upon contact with the skin.
May be a reproductive hazard.

Section 4 - First Aid Measures

■ Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.
Get medical aid.

■ Skin

If the content adhere to skin, immediately wash it with a large amount of clean water for more than 15

minutes, and consult a doctor.

■ **Inhalation**

Remove from exposure and move to fresh air immediately. Use oxygen if available.

■ **Ingestion**

If a cell is swallowed, immediately call a doctor for therapy and treatment.

Section 5 - Fire Fighting Measures

■ **Extinguishing Media**

Dry sand, dry chemical, graphite powder

■ **Prohibited fire extinguishers**

Do not use water, CO₂, CCl₄ and halides.

■ **Special Fire-Fighting Procedures**

In the initial state of a fire, move cell/batteries from near the fire source, to a safe location, as far as possible, and be sure to put on a protective breathing mask.

■ **Unusual Fire and Explosion Hazards**

Cell may vent when subjected to excessive heat-exposing battery contents.

■ **Hazardous Combustion Products**

Carbon monoxide, carbon dioxide, lithium oxide fumes.

Section 6 - Accidental Release Measures

■ **Steps to be Taken in case Material is Released or Spilled**

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery 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 Disposal Method**

It is recommended to discharge the battery to the end, handing in the abandoned batteries to related department unified, dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental protection agency and/or federal EPA.

Section 7 - Handling and Storage

The battery should not be opened, destroyed or incinerated, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

■ **Handling**

If a cell is leaking or smells, wear protective gloves and breathing mask, move the cell into a hermetically sealed vessel and dispose of the vessel. Never solder a cell self. Any leakage or obnoxious odor of a cell may lead to corrosion, so immediately dispose of the cell. Do not contact cell terminals between each other, or with another conductor. Neither throws into fire, decompose, heat, dent, deform, charge nor drop a cell. Do not dip a cell in water or seawater.

■ **Storage**

Store cells without direct sunlight, high temperature, high humidity, rain, dew, etc., and select a storage location with a temperature as low as possible (preferable temperature 20±5°C and relative

humidity 70% or less). In addition, keep cells away from dangerous matter such as combustible or ignitable materials. Absolutely never place a cell in contact with a combustible or conductive substance. Prepare appropriate firefighting equipment.

■ Other Precautions

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Section 8 - Exposure Controls, Personal Protection

■ Respiratory Protection

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

■ Ventilation

Not necessary under conditions of normal use.

■ Protective Gloves

Not necessary under conditions of normal use.

■ Other Protective Clothing or Equipment

Not necessary under conditions of normal use.

Personal Protection is recommended for venting battery: Respiratory protection, Protective gloves, protective clothing and safety glass with side shields.

Section 9 - Physical and Chemical Properties

Shape	: Cylindrical.
PH	: Not applicable
Boiling point/boiling range	: No information
Melting point	: No information
Decomposition temperature	: No information
Flash point	: No information

Section 10 - Stability and Reactivity

■ Stability

Stable.

■ Conditions to Avoid

Heating, mechanical abuse and electrical abuse.

■ Hazardous Decomposition Products

SO₂(gas)、HCl (gas)、H₂ (gas) .

■ Hazardous Polymerization

N/A.

■ Conditions to be avoided

If a number of cells are mixed up without insulating terminals, they may short and possibly heat, break and ignite. When a cell is charged, the gas released vent of the cell may operate resulting possibly in bursting the electrolyte etc. Or, it may possibly burst or fire. If a cell is heated over the highest temperature or thrown into fire, it may explode or fire with the electrolyte etc. bursting from inside of the cell. If decomposed, there is a possibility of overheating to short circuit.

Section 11 - Toxicological Information

There is no toxicity because chemical substance are hermetically sealed in a metal vessel.

As a reference, chemical substances composing a cell are described below.

Lithium metal

- Acute toxicity : No appropriate report available.
- Local effect : A skin contact may result in inflammation.

Thionyl chloride

- Acute toxicity : Lc50:500ppm(Rat inhalation).
- Local effect : Cough, breathing difficulty and asthma may pass into a chronic state, and the lung may be affected by adisease.

Aluminum chloride

- Acute toxicity : LD50:3700ppm(Rat oral).
- Local effect : No information.

Lithium chloride

- Acute toxicity : LD50:526ppm(Rat oral).
- Local effect : The central nervous system and the kidney may be affected.

Carbon black

- Acute toxicity : LD50:2000ppm>(Rat inhalation).
- Carcinogenic property : IARC group 2(May be carcinogenic).

Section 12 - Ecological Information

When promptly used or disposed the battery does not present environmental hazard. When disposed, keep away from water, rain and snow.

Section 13 - Disposal Considerations

■ APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amount of not reaction or unconsu med lithium remaining in the spent battery. The battery must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste. Recycling of battery can be done in authorized facility, through licensed waste carrier.

Section 14 - Transport Information

■ Lithium metal cells and batteries are classified as Class 9 Dangerous Goods in the United Nations Recommendation, and given UN numbers as shown in the below table. In case of transport of lithium metal cells and batteries, compliance with all the relevant UN regulations in addition to the requirements of United Nations Recommendation is required.

■ Our battery (list on section 1) and its shipping package comlies with the requirement of UN Manual of Test and Cirteria, Part III, subsection 38.3 as well as the requirements described below, so it is permitted to transport.

■ Air Transport

The battery package complies with the requirements of section IB of packing instruction 968 of 57th DRG Manual of IATA: only Cargo Aircraft

ER321250MR-145 battery has been proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3 (Document No.: ST/SG/AC.10/11/Rev 5th/Amend.2/Section 38.3). According to the United Nations "Recommendations on the Transport of

Dangerous Goods Model Regulations", the ER321250MR-145 battery's lithium content is more than 1g, so ER321250MR-145 battery should transport as class 9 dangerous goods.

■ **Sea Transport**

The battery package complies with the special provision 188 of IMDG CODE(Amdt.37-14)2014 Edition:the gross weight of the package does not exceed 30Kg.

ER321250MR-145 battery has been proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3 (Document No.: ST/SG/AC.10/11/Rev 5th/Amend.2/Section 38.3). According to the United Nations "Recommendations on the Transport of Dangerous Goods Model Regulations", the ER321250MR-145 battery's lithium content is more than 1g, so ER321250MR-145 battery should transport as class 9 dangerous goods.

UN NO.	Proper Shipping Name/Description
3090	Lithium metal batteries
3091	Lithium metal batteries contained in equipment
3091	Lithium metal batteries packed with equipment

Related regulations: Following regulations shall be cited and considered.

Transportations	Related organization / Issue documents
Air transport (by airplane)	ICAO(International Civil Aviation Organization)/TI(technical Instruction) IATA(International Air Transport Association)/DGR(Dangerous Goods regulations*1)
Maritime transport (by ship)	IMO(International Maritime Organization)/IMDG CODE(International Maritime Dangerous Goods)*2
Land transport (Intra-European)	RID(International Carriage of Dangerous Goods by Rail),ADR(International Carriage of Dangerous Goods by Road)
USA / UN	USDOT(US Department of transportation) / DOT 49 CFR (US law) UN: Recommendations on the transport of dangerous goods:Manual of Test and Criteria 5th revised edition Amendment 1[ST/SG/AC.10/11/Rev.5/Amend.1]:Part III,Subsection 38.3

Section 15 - Regulatory Information

■ **Law Information**

- 《Dangerous Goods Regulation》
- 《Recommendations on the Transport of Dangerous Goods Model Regulations》
- 《International Maritime Dangerous Goods》
- 《Technical Instructions for the Safe Transport of Dangerous Goods》
- 《Classification and code of dangerous goods》
- 《Occupational Safety and Health Act》 (OSHA)
- 《Toxic Substances Control Act》 (TSCA)
- 《Consumer Product Safety Act》 (CPSA)
- 《Federal Environmental Pollution Control Act》 (FEPCA)
- 《The Oil Pollution Act》 (OPA)
- 《Superfund Amendments and Reauthorization Act Title III (302/311/312/313)》 (SARA)
- 《Resource Conservation and Recovery Act》 (RCRA)

《Safety Drinking Water Act》 (CWA)

《California Proposition 65》

《Code of Federal Regulations》 (CFR)

In accordance with all Federal, State and Local laws.

Section 16 - Additional Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Notes on this sheet

*1 IATA Dangerous Goods Regulations 57th—2016 Edition:International Air Transport Association.

*2 IMDG CODE(Amdt 37-14) —2014 Edition:International Maritime Dangerous Goods.