

## MATERIAL SAFETY DATA SHEET

### 1. Product and Company Identification

**Product Category:** Lithium-Thionyl Chloride (Li-SOCl<sub>2</sub>) Battery

**Nominal Voltage:** 3.6 V

**Product Name**

Type	CLASS 9 (UN)	Lithium (gr.)
ER14250		0.31
ER14250C		0.31
ER14250V		0.31
ER14335		0.43
ER14505		0.69
ER14505V		0.67
ER17505		0.93
ER18505		0.98
ER14250M		0.19
ER14335M		0.34
ER14505M		0.51
ER17505M		0.72
ER18505M		0.90
ER22G68 (BEL)		0.10
ER32L65 (1/10D)		0.25
ER32L100 (1/6D)		0.44
ER1860		0.07
ER2450T		0.13
EF651615 (LTC-3PN)		0.10
EF651620 (LTC-5PN)		0.14
EF651625 (LTC-7PN)		0.19
EF702338 (LTC-16PN)		0.41
ER26500	Class 9	2.20
ER26500C	Class 9	2.20
ER34615	Class 9	4.92
ER34615C	Class 9	4.92
ER34615E	Class 9	4.40
ER341245	Class 9	9.07
ER26500M	Class 9	1.55
ER34615M	Class 9	3.36
ES-261520/W	Class 9	2.20
ES-261550/W	Class 9	2.20

ES-341520/W	Class 9	4.92
ES-341550/W	Class 9	4.92
ES-341520/W DD	Class 9	9.07
ES-341550/W DD	Class 9	9.07

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**Note:** The battery is neither substance nor mixture but product and having no risk to life and health under normal use or transportation because ingredients of battery is not leaked out by virtue of hermetical sealing with metal case.

This sheet notifies possible risk of our battery under abnormal use but mainly aim to provide information about ingredients, notification of handling and transportation regulations as a useful reference.

## 2. Hazards identification

The important hazards and adverse effects of the chemical product	No information available
Chemical product – specific hazards	No information available
Outline of an anticipated emergency	Chemical contents are seal in metal can. Therefore, risk of exposure never occurs unless battery is mechanically or electrically abused. Risk of explosion by fire is anticipated if batteries are dispose of in fire or heated above 100 degree Celsius. Stacking or jumbling of batteries may cause external short circuits, heat generation, in some case, allowing fire or explosion.

**Note: our battery is not classified in accordance with the GHS classification.**

## 3. Composition/Information on Ingredient

Chemical Name	Molecular Formula	CAS No.	Weight(%)
Lithium	Li	7439-93-2	3.5~5.0
Carbon	C	1333-86-4	3~6
Tetrafluoroethylene	(C <sub>2</sub> F <sub>4</sub> ) <sub>n</sub>	9002-84-0	N/A
Thionyl Chloride	SOCl <sub>2</sub>	7719-09-7	40~45
Aluminum Chloride	AlCl <sub>3</sub>	7446-70-0	1-5
Lithium Chloride	LiCl	7447-41-8	N/A
Stainless Steel	N/A	N/A	N/A

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Glass	Na <sub>2</sub> O.CaO.6SiO <sub>2</sub>	N/A	N/A
Nickel	Ni	7440-02-0	N/A

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#### 4. First-aid measures

Inhalation	If ingredient leaked out from inside of a battery and if inhaled it, move to a place where fresh air is provided. Refer for medical attention.
Skin contact	If ingredient leaked out from inside of a battery and stuck on skin, wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin. Refer for medical attention.
Eyes contact	If ingredient leaked out from inside of a battery and came into eyes, flush the eyes with plenty of water for at least 15 minutes immediately without rubbing. Take a medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.
Swallowing	In case of swallowing of battery, immediately refer for medical attention.

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#### 5. Fire-fighting Measures

##### Fire extinguishing agent:

Dry chemical, alcohol-resistant foam, powder, atomized water, carbon dioxide and dry sand are effective.

##### Extinguishing method:

Escape batteries to safe place prevent from ignition by spreading fire.

Because of packing material of battery is paper, use water extinguisher, CO<sub>2</sub> extinguisher or powder extinguisher as normal extinguisher.

Since vapor, generated from burning batteries may make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

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#### 6. Accidental Release Measures

Chemical contents are sealed in metal can. But if the battery is mechanically or electrically abused, contents may leak out. In such case, take action as shown below.

**Personal precautions:** Temporary inhalation of odor and attaching of electrolyte to skin does not cause serious health hazard. Be sure the ventilation and washing out of electrolyte quickly.

**Environmental precautions:** Clean up it quickly. Specific environmental precaution is not necessary.

##### Method and materials for containment and methods and materials for cleaning up:

Contain and collect spillage and place in container for disposal according to local regulations.

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#### 7. Handling and Storage

Handing	Do not charge, short-circuit, disassemble, deform, heat above 100°C or incinerate. Do not pile up or mingle battery with each other. Do not place battery on metal case, metal plate or antistatic material. In case of multi cell application, replace all batteries to new at once when replacing used batteries.
Storage	Be sure to store batteries in well-ventilated, dry and cool conditions. Keep away from water, rain, snow, frost or dew condensation. Do not store batteries near source of heat or nozzle of hot air. Do not store batteries in direct sunshine. Take care not to get wet packing by dew condensation when packing is removed from cold to warm and humid condition. Enough number of fire fighting apparatuses should be installed in warehouse

## 8. Exposure Controls and Personal Protection

There is no need of personal protective equipment on regular handling and storage. In the event, however, a large amount of electrolyte should be released by mechanical or electrical abuse, use the protection as shown below.

Respiratory protection: Mask (with a filter preferably)

Hand protection : Synthetic rubber gloves

Eye protection : Goggles or glasses

## 9. Physical and Chemical Properties

State: Solid

Shape: Cylindrical、Prismatic

## 10. Stability and Reactivity

Stability: Stable on regular handling

Conditions to Avoid: External short circuit of battery, deformation by crush, exposure at high temperature of more than 100 degree C (may cause heat generation and ignition), direct sunlight, high humidity.

Materials to avoid: Substances that cause short circuit.

## 11. Toxicological Information

Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

## 12. Ecological Information

Persistence and degradability	No information available
Mobility in soil	No information available

### 13. Disposal Considerations

Dispose of batteries in accordance with applicable federal, state and local regulations.

For safety precaution, battery should be insulated in proper manner; covering both terminals by tape, wrapping of battery in insulative bag or packing battery in original package is recommended in order to prevent ignition due to short-circuit.

### 14. Transport Information

Lithium metal cells and batteries are given UN numbers as shown in the below table.

For the international transport of lithium batteries, they must comply with these regulations: the International Maritime Dangerous Goods (IMDG) Code by International Maritime Organization (IMO), Dangerous Goods Regulations (DGR) by International Air Transport Association (IATA) and Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI) by International Civil Aviation Organization (ICAO). These regulations are based on the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.

Lithium batteries which meet the requirements of UN38.3 (UN Manual of Tests and Criteria, Part III, subsection 38.3) could be transported by air and by sea as ordinary goods, otherwise should be transported according to Class 9, Packing Group II hazardous goods.

Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.

Each package must be capable of withstanding a 1.2 m drop test in any orientation without:

- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.

The goods are primary lithium batteries. Each package must be marked indicating that it contains lithium batteries and that special procedures should be followed in the event that the package is damaged. Each shipment must be accompanied with a document indicating that the packages contain lithium batteries and that special procedures should be followed in the event a package is damaged.

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)
Maritime transport (by ship)	IMO (International Maritime Organization) / IMDG Code (International Maritime Dangerous Goods Code)

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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 Tests and Criteria,Revision 7,Amendment 1 [ST/SG/AC.10/11/Rev.5/Amend.1]: Part III, Subsection 38.3

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## 15. Regulatory Information

Environment-related law of batteries: EU nations have applicable law in accordance with Directive 2006/66/EC and other some countries, China, Korea, Brazil, some provinces of USA and Canada or so have similar law.

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## 16. Other information

### Reference

- **IATA Dangerous Goods Regulations, 62nd edition**

This sheet refers to normal use of the product in question. EVE Corp. makes no warranty expressed or implied.