



**Material - Safety - Data Sheet (MSDS)**  
for  
**Ansmann Lithium-Thionyl-Chloride (Li-metal) Batteries**  
single cells and multi-cell battery packs

No.2

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## **1. Product and Supplier Identification**

Product name: ANSMANN Lithium Battery

Designation: Lithium Metal Battery

Models / types: Round cells, ER series

Electrochemical system: Li-SOCl<sub>2</sub> (Lithium-Thionyl)

Supplier:

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**EMERGENCY CONTACT:** For chemical emergency only (spill, leak, fire, exposure or accident)

call phone no.: +49 6294 4204 0

## **2. Hazards Identification**

The Lithium Thionyl Chloride batteries described in this MSDS are hermetically sealed units, which are not hazardous when used according to the recommendations of the manufacturer.

Under normal condition of use of the batteries, the electrode materials and the liquid electrolyte they contain are non-reactive provided the battery integrity is maintained.

Risk of exposure exists only in case of mechanical, electrical or thermal abuse. Thus the batteries should not short circuited, recharged, punctured, incinerated, crushed, immersed in water, force discharged or exposed to temperatures above the temperature range of the cell or battery.

In these cases there is risk of fire or explosion.



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## 3. Composition and Informations on Ingredients

Each cell consists of a hermetically sealed metallic container containing a number of chemicals and materials of construction of which the following could potentially be hazardous upon release.

Ingredient	Content	CAS No.	CHIP Classification		
Lithium (Li)	4 - 5.5%	7439-93-2	 	<b>F; R14/15; C; R34; R14/15; R21, R22 R35, R41, R43; S1/2, S8, S43, S45</b>	
Thionyl chloride (SoCl <sub>2</sub> )	25 - 45%	7719-09-7	 	<b>C, Xn; R14, R21, R22, R35, R37, R41 R42/43; S2,S8,S24,S26,S36,S37,S45</b>	
Aluminum chloride (AlCl <sub>3</sub> )	1 - 5%	7446-70-0	 	<b>C; R14, R22, R37, R41, R43 S2, S8, S22, S24, S26, S36, S45</b>	
Tetrafluoroethylene (C <sub>2</sub> F <sub>4</sub> )	0 - 0.02%	902-84-0	  	<b>F+; R12 R12, R49</b>	
Carbon, black (Cn)	30 - 35%	1333-86-4		none known	
Fibreglass	2 - 3%				
stainless steel (shell) (Fe)	30 - 35%	7439-89-6			

Remark: The weight of metallic lithium per cell is:  
0.30g 1/2AA-size      2.21g C-size  
0.60g AA-size      4.86g D-size  
0.96g A-size

## 4. First Aid Measures

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

## 5. Fire Fighting Measures

CO<sub>2</sub> extinguishers or, even preferably, copious quantities of water or water-based foam, can be used to cool down burning Li- SOCl<sub>2</sub> 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 (marked by deep red flames).

Do not use for this purpose sand, dry powder or soda ash, graphite powder or fire blankets.

**Use only metal (Class D) extinguishers on raw lithium.**

**Extinguishing media**      Use water or CO<sub>2</sub> on burning Li-SOCl<sub>2</sub> cells or batteries and class D fire extinguishing agent only on raw lithium.

## 6. Accidental Release Measures

Remove personnel from area until fumes dissipate. Do not breathe vapours or touch liquid with bare hands.

If the skin has come into contact with the electrolyte, it should be washed thoroughly with water.

Sand or earth should be used to absorb any exuded material. Seal leaking battery and contaminated absorbent material in plastic bag and dispose of as Special Waste in accordance with local regulations.



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## **7. Precautions for safe Handling and Use**

<b>Storage:</b>	Store in a cool (preferable below 30°C), well ventilated area, away from moisture, sources of heat, open flames, food and drink. Elevated temperatures can result in shortened battery life. Temperatures above 100°C may result in battery leakage and rupture. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles. Keep batteries in original packaging until use and do not jumble them.
<b>Mechanical Containment:</b>	If potting or sealing the battery in an airtight or watertight container is required, consult Ansmann AG representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.
<b>Handling:</b>	Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short-circuit will cause the battery to lose energy, generate significant heat and cause the safety vent release vent to open. Sources of short-circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.  The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and / or explosion. Crushed or damaged batteries may result in a fire.  If soldering or welding to the battery is required, consult your Ansmann representative for proper precautions to prevent seal damage or short-circuit.
<b>Charging:</b>	Do not charge this batteries! This battery type is manufactured in a ready-to-use-state. It is not designed for recharging.  Recharging can cause battery leakage, or in some cases, can cause the safety release vent to open. Inadvertent charging can occur if a battery is installed backwards.
<b>Disposal:</b>	Dispose in accordance with all applicable federal, state and local regulations.

## **8. Special Protection Information**

<b>Ventilation Requirements:</b>	Not necessary under normal conditions. Room ventilation may be required in areas where there are open or leaking batteries.
<b>Respiratory Protection:</b>	Not necessary under normal conditions. Avoid exposure to electrolyte fumes from open or leaking battery. In all fire situations, use self-contained breathing apparatus
<b>Eye Protection:</b>	Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.
<b>Hand Protection:</b>	Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery

## **9. Physical and Chemical Properties**

<b>Appearance:</b>	Cylindrical or prismatic shape
<b>Odour:</b>	If leaking, gives off a pungent corrosive odour.
<b>Flashpoint:</b>	Not applicable unless individual components exposed
<b>Flammability:</b>	Not applicable unless individual components exposed
<b>Relative density:</b>	Not applicable unless individual components exposed
<b>Solubility (water):</b>	Not applicable unless individual components exposed
<b>Solubility (other):</b>	Not applicable unless individual components exposed



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## **10. Stability and Reactivity**

Product is stable under conditions described in Section 7.

**Conditions to avoid:** Heat above 100° or incinerate. Deform. Mutilate. Crush. Pierce. Disassemble. Recharge. Short circuit. Expose over a long period to humid conditions.

**Materials to avoid:** Oxidising agents, alkalis, water. Avoid electrolyte contact with aluminium or zinc.

**Hazardous decomposition products:** Hydrogen (H<sub>2</sub>) as well as Lithium oxide (Li<sub>2</sub>O) and Lithium hydroxide (LiOH) dust is produced in case of reaction of lithium metal with water. Chlorine (Cl<sub>2</sub>), Sulphur dioxide (SO<sub>2</sub>) and Disulphur dichloride (S<sub>2</sub>Cl<sub>2</sub>) are produced in case of thermal decomposition of Thionyl chloride above 140°C. Hydrochloric acid (HCl) and Sulphur dioxide (SO<sub>2</sub>) are produced in case of reaction of Thionyl chloride with water at room temperature. Hydrochloric acid (HCl) fumes, Lithium oxide, (Li<sub>2</sub>O), Lithium hydroxide (LiOH) and Aluminum hydroxide (Al(OH)<sub>3</sub>) dust are produced in case of reaction of Lithium tetrachloroaluminate (LiAlCl<sub>4</sub>) with water.

## **11. Toxicological Information**

**Signs & symptoms:** None, unless battery ruptures. In the event of exposure to internal contents, corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

**Inhalation:** Lung irritant

**Skin contact:** Skin irritant

**Eye contact:** Eye irritant

**Ingestion:** Tissue damage to throat and gastro-respiratory tract if swallowed

**Medical conditions generally aggravated by exposure:**

In the event of exposure to internal contents, eczema, skin allergies, lung injuries, asthma and other respiratory disorders may occur.

## **12. Ecological Information**

**Mammalian effects:** None known if used / disposed of correctly

**Eco-toxicity:** None known if used / disposed of correctly

**Environmental fate:** None known if used / disposed of correctly

## **13. Disposal Information**

Do not incinerate, recharge, disassemble short, or subject cells to temperatures in excess of 100°C. Such abuse can result in loss of seal, leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

When properly used and disposed the battery does not present environmental hazard. The battery does not contain mercury, cadmium, or lead. Do not let internal components enter marine environment.

Avoid release to waterways, wastewater or ground water.

USA: Batteries must be completely discharged prior to disposal and / or the terminals must be taped or capped to prevent short circuit. This product does not contain any materials listed by the United States EPA as requiring specific waste disposal requirements. When completely discharged it is not considered hazardous. Disposal of large quantities of lithium power cells may be subject to Federal, State, or Local regulations.

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association ([http://www.epbaeurope.net/legislation\\_national.html](http://www.epbaeurope.net/legislation_national.html))

Importers and users outside EU should consider the local laws and rules.



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**14. Transport Information**

**ADR**

UN-Number:	3090
description	Lithium metal batteries
class:	9
packaging order:	P903
special provision:	188; 230; 310; 376; 377; 387; 636
tunnel forbidden code:	E
UN-Number:	3091
description	Lithium metal batteries contained in equipment / packed with equipment
class:	9
packaging order:	P903
special provision:	188; 230; 310; 360; 376; 377; 387; 390; 670
tunnel forbidden code:	E

**IATA**

UN-Number:	3090
description	Lithium metal batteries
class:	9
packaging order:	968
special provision:	A88; A99; A154; A164; A183; A201; A206; A213; A334; A802
UN-Number:	3091
description	Lithium metal batteries contained in equipment
class:	9
packaging order:	970
special provision:	A48; A88; A99; A154; A164; A181; A185; A206; A213
UN-Number:	3091
description	Lithium metal batteries packed with equipment
class:	9
packaging order:	969
special provision:	A88; A99; A154; A164; A181; A185; A206; A213

**IMDG-Code 2021**

UN-Number:	3090
description	Lithium metal batteries
class:	9
packaging order:	P903
special provision:	188; 230; 310; 376; 377; 384; 387
UN-Number:	3091
description	Lithium metal batteries contained in equipment / packed with equipment
class:	9
packaging order:	P903
special provision:	188; 230; 310; 360; 376; 377; 384; 390; 387



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Since 1<sup>st</sup> of January 2013 it is necessary to produce both, lithium cells and lithium batteries under an existing quality assurance program.

The quality assurance program is detailed in following parts of the international dangerous goods laws:

- ADR (2021): 2.2.9.1.7 (e)
- IATA (2021, 62<sup>nd</sup> edition): 3.9.2.6 (e)
- IMDG-Code 2021 (Amendment 40-20): 2.9.4 (5.)

Ansmann hereby declare that all lithium cells and batteries of the Ansmann product range are produced according the above named quality assurance program.

## **15. Regulatory Information**

Regulations specifically applicable to the product:

- ACGIH and OSHA: see exposure limits of the internal
- IATA / ICAO (air transportation): UN 3090 or UN 3091
- Transportation within the US-DOT, 49 Code of Federal Regulations

### **substance**

### **Risk Phrases**

Lithium (Li)	R14 / R15 R21 R22 R35 R41 R42 / 43	Reacts violently with water, liberating extremely flammable gases. Harmful in contact with skin. Harmful if swallowed. Causes severe burns. Risk of serious damage to eyes May cause sensitization by inhalation and skin contact.
Thionyl Chloride (SOCl <sub>2</sub> )	R14 R22 R35 R37 R41 R42 / 43	Reacts with water. Harmful if swallowed. Causes burns. Irritating to respiratory system. Risk of serious damage to eye. May cause sensitization by inhalation and skin contact.
Aluminum Chloride anhydros	R14 R22 R37 R41 R43	Reacts with water. Harmful if swallowed. Irritating to respiratory system. Risk of serious risk to eye May cause sensitization by skin contact.

### **substance**

### **Safety Phrases**

Lithium (Li)	S2 S8 S45	Keep out of reach of children Keep away from moisture In case of incident, seek medical attention
Thionyl Chloride (SOCl <sub>2</sub> )	S2 S8 S24 S26 S36 S37 S45	Keep out of reach of children Keep away from moisture Avoid contact with skin In case of contact with eyes, rinse immediately with plenty of water. Wear suitable protective clothing. Wear suitable gloves. In case of incident, seek medical attention.
Aluminum Chloride anhydros	S2 S8 S22 S24 S26 S36	Keep out of reach of children. Keep away from moisture. Do not breath dust. Avoid contact with skin In case of contact with eyes, rinse immediately with plenty of water. Wear suitable protective clothing.



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**16. Other Information**

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