



Safety Data Sheet (SDS)
for
Ansmann Lithium-Iron-Disulfide (Li-metal) Batteries
single cells and multi-cell battery packs

No.1

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Section 1: Identification

Product Identifier

Product name: "ANSMANN EXTREME Lithium"; "ANSMANN INDUSTRIAL Lithium"
Designation: Lithium Metal Battery
Models / types: AA / FR6 / L91; AAA / FR03 / L92
Electrochemical system: Li-FeS₂ (Lithium-Iron-Disulfide)
Primary, not designated for Recharge

Supplier Details

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EMERGENCY CONTACT: For chemical emergency (spill, leak, fire, exposure or accident)
call phone no.: +49 6294 4204 0

Legal remark (USA)

Safety Data Sheets are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". According to OSHA, "article" means a manufactured item other than a fluid particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard.



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Legal remark (EU)

These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006EC. Instead they have to be regarded as "articles", no substances are intended to be released during handling. Therefore there is no obligation to supply a "safety data sheet according to Regulation (EC)1907/2006, Article 31"

General remark

This safety data sheet is provided as a service to our customers. The details presented are in accordance with our present knowledge and experiences. They are no contractual assurances of product attributes.

Section 2: Hazard(s) Identification**2.1 Classification of the substance or mixture****Classification according to UN-GHS**

Batteries are considered as articles are as such exempted from the UN-GHS classification requirements. The classification based on the hazardous substances contained in the product (electrode materials and liquid electrolyte contained in the batteries) is provided in section 3 and 16; this is for information purposes only.

2.2 GHS Label elements, including precautionary statements

The UN GHS labeling information is not provided in this section as batteries are articles and therefore are exempted from the UN GHS labeling requirements. Other labeling requirements apply for batteries according to EU Directive 2006/66/EC.

Nevertheless the following warning must be observed: Keep out of the reach of children!

2.3 Other hazards which do not result in classification

The chemicals mentioned in section 3 are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety Precautions in section 7). Swallowing of a battery can lead to chemical burns, perforation of soft tissues and death.

Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately.

Section 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.	Hazard Categories	Hazard Statements
Lithium-Aluminum Alloy (Li-Al)	4 - 6%	7439-93-2	Water-react. 1 Skin Corr. 1B	H260 H314
Iron Disulfide (FeS ₂)	25 - 40%	1309-36-0	Skin Corr./Irrit. 3 Serious Eye Damage/Irrit. 2 Specific target organ toxicity - respiratory system 3	H317 H320 H335
Propylene Carbonate	<5%	108-32-7	Eye Irrit. 2	H319
1,2-Dimethoxyethane (DME)	<5%	110-71-4	Flam.Liq. 2; Acute Tox. 4 Repr. 1B	H225; H332 H360-FD
1,3-Dioxolane (DOL)	<10%	646-06-0	Flam.Liq. 2	H225
Lithium Perchlorate (LiClO ₄)	<1%	7791-03-9	Ox. Sol. 2; Skin Irrit. 2 Eye Irrit. 2; STOT SE 3	H272; H315 H319; H335
Graphite	1 - 3%	7782-42-5	Skin Corr./Irrit. 3 Serious Eye Damage/Irrit. 2 Specific target organ toxicity - respiratory system 3	H316 H320 H335
stainless steel (Fe)	30 - 40%	7439-89-6	non-hazardous	
Aluminum (Al)	2 - 8%	7429-90-5	non-hazardous	
Acetylene Carbon black (C)	1 - 2%	1333-86-4	Eye Irrit. 2A STOT SE 3	H319 H335
Polypropylene	2 - 5%	9003-07-0	non-hazardous	
Adhesive CMC	0.1 - 2%	9085-26-1	non-hazardous	
Adhesive SBR	0.1 - 2%	9003-55-8	non-hazardous	

Remark: The weight of metallic lithium is ≤ 1.0g per AA (FR6) cell ≤ 0.50g per AAA (FR03) cell



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Section 4: First Aid Measures

- Inhalation:** Provide fresh air. In severe cases obtain medical attention.
- Skin Contact:** Wash off skin thoroughly with water. Remove contaminated clothing and wash before re-use. In severe cases obtain medical attention.
- Eye Contact:** Irrigate thoroughly with water for at least 15 minutes. Lift upper and lower lids, until no evidence of the chemical remains. Obtain medical attention.
- Ingestion:** Wash out mouth thoroughly with water. Do not induce vomiting or give food or drink. Seek medical attention immediately.
- Further treatment:** 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.

Section 5: Fire Fighting Measures

CO₂ extinguishers or, even preferably, copious quantities of water or water-based foam, can be used to cool down burning Li-FeS₂ 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 CO₂ on burning Li-FeS₂ cells or batteries and class D fire extinguishing agent only on raw lithium.

Section 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.

Section 7: Precautions for safe Handling and Use

- Storage:** 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.

- Mechanical Containment:** 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.

- Handling:** 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.

- Charging:** 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.



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Disposal: Dispose in accordance with all applicable federal, state and local regulations.

Section 8: Special Protection Information

Ventilation Requirements: Not necessary under normal conditions. Room ventilation may be required in areas where there are open or leaking batteries.



Respiratory Protection: Not necessary under normal conditions. Avoid exposure to electrolyte fumes from open or leaking battery. In all fire situations, use self-contained breathing apparatus



Eye Protection: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.



Hand Protection: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery

Section 9: Physical and Chemical Properties

Appearance: small round cylinders Odour: n/a

Vapour Density: n/a Vapour Pressure: n/a

Boiling Point: n/a VOC Content: n/a

Evaporation Rate: n/a Solubility in Water: n/a

Specific Gravity: not determined pH: not determined

Ingredients:
- FeS₂ is a brass-coloured, odourless mineral powder
melting point: FeS₂ decomposes at 1193°C
- Lithium is a soft, silvery metal
- Electrolyte is an organic solvent, consisting of PC, DME, DOL, lithium perchlorate
this organic solvent is an odourless, colourless or light yellow liquid

Section 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 sulfide gas; Sulfur dioxide gas; Corrosive lithium hydroxide fumes

Section 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.



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Section 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

Section 12: 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)

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

Section 14: Transport Information

General considerations

Ansmann Lithium Iron Disulfide batteries are considered to be UN 3090 Lithium Metal Batteries and are tested according to subsection 38.3 of the "UN Manual of Tests and Criteria" for compliance with the requirements of special provisions ADR 188, IMDG 188, as well as the requirements of DOT / 49 CFR § 173.185, and the requirements of IATA DGR packing instruction 968. Test results as well as other relevant information required for transportation are given in dedicated "Supplier's Test Summaries".

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN 3091.

During the transportation of large amounts of batteries by ship, trailer or railway, do not store them in places of high temperature and do not allow them to be exposed to condensation. During the transportation do not allow the packaging to be damaged, as a damage of the packaging may cause fire.

In the event packaging is damaged, special procedures must be used including inspection and repackaging if necessary and handle with care.

Compilations of transport requirements for Lithium batteries can be found in:

<https://www.lithium-batterie-service.de/en/>

<https://www.iata.org/en/programs/cargo/dgr/lithium-batteries/>

Each cell or battery is manufactured under a quality management program according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 e), and IMDG code clause 2.9.4.5.

IEC 60086-1

Code of practice for packaging and shipment of primary batteries given in IEC 60086-1:

"The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture."

"Shock and vibration shall be kept to a minimum. For instance, boxes should not be thrown off trucks, slammed into position or piled so high as to overload battery containers below.

Protection from inclement weather should be provided."



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Covered regulations:	Latest covered modifications of transport regulations: <ul style="list-style-type: none">- Air: IATA DGR 2025 (66th edition)- Road: ADR 2025- Sea: IMDG Code 2022 (inc. Amendm. 42-22)- Rail: RID 2025 Latest covered modification of the European Battery Regulation (2023/1542)
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Section 15 Regulatory Information

Marking consideration

European Union: According to "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" the batteries have to be marked with the crossed bin.

Ansmann Lithium Iron Disulfide batteries conform to the requirements of the EU Battery Regulation (EU) 2023/1542 and are thus marked with the CE symbol from August 18, 2024.

REACH regulation (1907/2006/EC)

Duty to communicate information on substances in articles (REACH, Article 33):

The product contains the following substance of very high concern (SVHC) in concentrations above 0.1% w/w: DME (CAS 110-71-4): reason for inclusion in the European candidate list - Toxic for reproduction (REACH, Article 57c).

International safety standards

For UL recognition of the basis cells according to UL 1642 see: BBCV2.MH13654

Water hazard class

The regulations of the German Federal Water Management Act (WHG) are not applicable as Ansmann Lithium Iron Disulfide cells are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled.

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

Section 16 Other Information

Full text of Hazard Statements referred to under section 3

H225	Highly flammable liquid and vapour.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H272	May intensify fire; oxidizer.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H316	Causes mild skin irritation
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H320	Causes eye irritation
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H360FD	May damage fertility. May damage the unborn child.

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