



Material - Safety - Data Sheet (MSDS)

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for
Ansmann Lithium-Manganese-Dioxide (Li-metal) Batteries
single cells and multi-cell battery packs

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1. Product and Supplier Identification

- 1.1 Product name: ANSMANN Lithium Photo Battery
Designation: Lithium Metal Battery
Models / types: CR123, CR2, CR-P2, 2CR5
- 1.2 Product name: ANSMANN Lithium Button Cell
Designation: Lithium Metal Battery
Models / types: CR1216, CR1220, CR1225, CR1616, CR1620, CR1632, CR2016, CR2025, CR2032, CR2330, CR2430, CR2450, CR2477
- 1.3 Product name: ANSMANN EXTREME Lithium
Designation: Lithium Metal Battery
Models / types: E-Block, 9V, (CR-V9, ER9V)
Electrochemical system: Li-MnO₂ (Lithium-Manganese-Dioxide)
- Supplier:
Germany ANSMANN AG
Address: Industriestraße 10; 97959 Assamstadt; Germany
Phone / Facsimile: + 49 (0) 6294 42040 / + 49 (0) 6294 42044
Home / email: ansmann.de / info@ansmann.de
- USA ANSMANN USA Corporation
Address: 10 Washington Avenue; 07004 Fairfield; New Jersey; USA
Phone / Facsimile: +1 973 4395244 1012 / +1 973 2062006
email: USA@ansmann.de
- United Kingdom ANSMANN Energy (UK) LTD
Address: Units 19/20, Maple Park; Essex Road; Hoddesdon; Hertfordshire EN11 0EX; UK
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email: UK@ansmann.de
- Hong Kong ANSMANN Energy Int. LTD.
Address: Unit 01-02, 10/F Floor Tung Wai Commercial Building, 109-111 Gloucester Road, Wan Chai, Hong Kong
- China HuiZhou City ANSMANN Trading Co. LTD
Address: Da Lian Industrial Park, Rengtu Village Ruhu Town Huicheng District, 516169 Huizhou City Guangdong, China
- Sweden ANSMANN Nordic AB
Address: Victor Hasselblads Gata 11, 421 31 Västra Frölunda, Sweden
- EMERGENCY CONTACT:** For chemical emergency only (spill, leak, fire, exposure or accident)
call CHEMTREC at: 800-424-9300 within the USA and Canada
+1 703-527-3887 outside the USA and Canada
Non-emergency calls cannot be serviced at this number.

2. Product and Supplier Identification

The Lithium-Manganese-Dioxide 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 contained 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.

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.

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.

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

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



Other: Not necessary under normal conditions. Use chemical apron in case of leakage





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9. Physical and Chemical Properties

Appearance:	cylindrical shape
Odour:	not applicable; unless in case of leakage, then smell of ether appears
Flash Point:	not applicable; unless individual components exposed
Flammability:	not applicable; unless individual components exposed
Relative density:	not applicable; unless individual components exposed
Solubility (water):	not applicable; unless individual components exposed
Solubility (other):	not applicable; unless individual components exposed

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.
Hazardous reactions:	Lithium metal reacts with water to produce highly flammable gases
Hazardous decomposition reactions:	Toxic fumes, and may form peroxides

11. Toxicological Information

Signs & symptoms:	None, unless battery ruptures. In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
Inhalation:	Lung irritant
Skin contact:	Skin irritant
Eye contact:	Eye irritant
Ingestion:	Poisoning if swallowed
Medical conditions aggravated by exposure:	In the event of exposure to internal contents, moderate to severe irritation, burning and dryness of the skin may occur. Target organs nerves, liver and kidneys.

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.



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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.

14. Transport Information

In general, the transportation of lithium-metal cells and batteries is regulated by the International Air Transport Association (IATA), International Civil Aviation Organization (ICAO), International Maritime Dangerous Goods Code (IMDG) and the US Department of Transportation.

Li-metal batteries are classified in class 9 - miscellaneous dangerous goods as:

- UN 3090, Lithium metal batteries
- UN 3091, Lithium metal batteries contained in equipment, or
- UN 3091, Lithium metal batteries packed with equipment.

In the absence of exceptions, these batteries must be shipped in quantities that comply with the limitations contained in the Regulations (see DGR Table 4.2). Also, they must be contained in specification packaging prescribed by the ICAO Technical Instructions and IATA Dangerous Goods Regulations. A completed package must display a Class 9 hazard label in addition to markings that identify the applicable proper shipping name and UN number. A shipper must document the shipment using a Shipper's Declaration for Dangerous Goods.

Exceptions:

Ansmann Li-MnO₂ cells containing less than 1gram of lithium or multicell packs containing less than 2g of lithium which are type proven to meet the requirement of each test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3, 5th revised edition, **can be shipped as none regulated as Dangerous Goods when they meet the following criteria for shipment:**

1. For air shipments, meet the requirements listed in the IATA Dangerous Goods Regulations (DGR), 53rd edition, section II of packing instructions 968 (lithium batteries), 969 (lithium batteries packed with equipment) , 970 (lithium batteries contained in equipment)
2. International Maritime Dangerous Goods Code (IMDG) pursuant to Special Provisions 188 and 230
3. Meet the requirements for the US Department of Transport (DOT) listed in 49 CFR 173.185, special provision 185 and 188

With limited exceptions, the transport of primary lithium batteries is prohibited aboard passenger aircraft. They must be marked : **"PRIMARY LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT"** or **"LITHIUM METAL BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT"**

Note: when manufacturing a new battery pack, one must assure that it is tested in accordance with the UN Model Regulations, Manual of Tests and Criteria, Part III, subsection 38.3

Label for Conveyance: For the single cell batteries and multicell battery packs that are non-restricted to transport (**non-assigned to the Miscellaneous Class 9**), use **Lithium Batteries Inside** label.

For the single cell batteries and multicell battery packs which are restricted to transport (**assigned to Class 9**), use **Class 9 Miscellaneous Dangerous Goods** and UN Identification Number labels.

In all cases, refer to the product transport certificate issued by the manufacturer.

UN Numbers: **UN 3090** (shipment of cells and batteries in bulk)
UN 3091 (cells and batteries contained in equipment or packed with it)

Shipping Names: **Lithium Metal Batteries**

Hazard Classification: Depending on their lithium metal content, some single cells and small multicell battery packs may be non-assigned to Class 9 (refer to transport certificate)

Packing Group: **II**

IMDG Code: 3090 (Lithium batteries)
3091 (Lithium batteries in or with equipment)



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Ems No. F-A, S-I
Marine Pollutant: No
ADR Class: Class 9

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 R34	Reacts violently with water, liberating extremely flammable gases. Causes burns.
Manganese-Dioxide	R20/22	Harmful by inhalation and if swallowed
Lithium Perchlorate	R8 R36/37/38	Contact with combustible material may cause fire. Irritating to eyes, respiratory system and skin.
Propylene Carbonate	R36	Irritating to the eyes.
1,2 Dimethoxyethane	R11 R19 R20	Highly flammable. May form explosive peroxides Harmful by inhalation
Lithium Trifluoromethyl sulfonate	R36/37/38	Irritating to eyes, respiratory system and skin.
Lithium Perchlorate	R20/22 R36/37/38 R9	Harmful by inhalation and if swallowed Irritating to eyes, respiratory system and skin. Explosive when mixed with combustible material

substance	Safety Phrases	
Lithium (Li)	S1/S2 S8 S43 S45	Keep locked up and out of reach of children Keep container dry. In case of fire, use Lith-X (Graphite based) fire extinguisher. Never use water. In case of accident or if you feel unwell, seek medical advice immediately.
Manganese Dioxide	S25	Avoid contact with eyes.
Lithium Perchlorate	S17 S26 S27 S36/37 S38	Keep away from combustible material. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice Take off immediately all contaminated clothing Wear suitable protective clothing and gloves. In case of insufficient ventilation wear suitable respiratory equipment.
1,2 Dimethoxyethane	S45 S53	In case of accident or if you feel unwell seek medical advice immediately. Avoid exposure - obtain special instructions before use
Propylene Carbonate	S24/25	Avoid contact with skin and eyes.
Lithium trifluoromethyl sulfonate	S26 S37/39	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice Wear suitable gloves and eye/face protection
Graphite, synthetic	S22 S24/25	Do not breathe dust Avoid contact with skin and eyes

15. Other Information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.

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battery type: Lithium - Manganese-Dioxide
battery size: IEC: 6AM6; ANSI: 1604LC; LA522; 9V-Block
chemical system: Li-MnO₂

Conditions

nominal voltage: 9 V
open circuit voltage: 9.4...10.2 V new battery
 9.3...10.2 V after 1 year storage at 20°C

capacity rated: 800 mAh all measurements at 20°C ambient discharge at 600Ω load; 24h/d End Voltage (EV): 5.4V
minimum: 750 mAh discharge at 10mA load; 24h/d End Voltage (EV): 5.4V
 700 mAh discharge at 50mA load; 24h/d End Voltage (EV): 5.4V

typical service output (new batteries)

≥ 54 h load resistor: 600Ω; EV: 5.4V discharge 24h/d
 ≥ 20.5 h load resistor: 270Ω; EV: 6.0V discharge 1h/d
 ≥ 47 h load resistor: 620Ω; EV: 6.0V discharge 2h/d

max. continuous discharge current: 200 mA

max. peak discharge current: 400 mA

internal resistance: ≤ 2 Ω at 1kHz, sine wave measurement (new battery) according to IEC 896-2

shelf life: 10 years under proper storage conditions

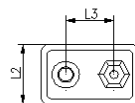
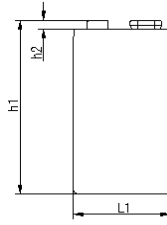
leakage resistance over discharge: no leakage 180ohms continuous discharge for 48h; ta: 20°C; RH: 60±15%
high temperature: no leakage store 20days at ta: 60°C; RH:90±5%

ambient temperature range: - 40...60 °C

recommended storage conditions: -20...40 °C ambient temperature
 45...75 % rel. humidity

mechanical specifications

cell dimensions
 length L1: 26.5 -1 mm
 length L2: 17.5 -2 mm
 length L3: 12.7 ± 0.25 mm
 height h1: 48.5 -2 mm
 weight: 34 ± 2 g



blister card dimensions: 120 x 85 mm
weight (incl. batteries): 45 ± 2 g



	ANSMANN Specifications for model:	Ansmann Lithium Battery
		9V - E-Block 1pcs blister package
	data sheet no. / part no.	5021023
	supplier no.	315040
	author / date	Gramlich / 17.02.2012