



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

No.4

1/7

Date of issue: 2011 - 07 - 06  
Revision no: 7  
Revision date: 2016 - 01 - 04  
Editor: Ansmann AG

The information contained within is provided as a service to our customers and for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate at the date of preparation. ANSMANN AG makes no warranty expressed or implied.

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

Product names: "ANSMANN CR..." Lithium Photo Battery; ANSMANN CR... Lithium Button Cell; "ANSMANN EXTREME Lithium"; "ANSMANN INDUSTRIAL Lithium"

Designation: Lithium Metal Battery

Models / types: CR123, CR2

CR1025, CR1216, CR1220, CR1225, CR1616, CR1620, CR1632, CR2016  
CR2025, CR2032, CR2330, CR2354, CR2430, CR2450, CR2477, CR3032  
E-Block, 9V, (CR-V9, ER9V)

Electrochemical system: Li-MnO<sub>2</sub> (Lithium-Manganese-Dioxide)

Supplier:

Germany

ANSMANN AG

Address:

Industriestraße 10; 97959 Assamstadt; Germany

Phone / Facsimile:

+ 49 (0) 6294 42040 / + 49 (0) 6294 420444

Home / email:

ansmann.de / info@ansmann.de

USA

ANSMANN USA Corporation

Address:

1001 Lower Landing Rd. Ste 101; Blackwood, NJ08012; USA

Phone / Facsimile:

+1 973 4395244 1012 / +1 973 2062006

email:

USA@ansmann.de

United Kingdom

ANSMANN UK LTD.

Address:

Units 11-12, RO24, Harlow Business Park, Harlow, Essex. CM19 5QB. UK

Phone / Facsimile:

+44 (0) 870 609 2233 / +44 (0) 870609 2234

email:

UK@ansmann.de

Hong Kong

ANSMANN Energy Int. LTD.

Address:

Unit 3117-18, 31/F; Tower 1; Millenium City 1; No. 388 Kwun Tong Road;  
Kwun Tong, kowloon; Hong-Kong

email:

hongkong@ansmann.de

China

HuiZhou City ANSMANN Trading Co. LTD

Address:

Da Lian Industrial Park, Rengtu Village Ruhu Town Huicheng District,  
516169 Huizhou City Guangdong, China

email:

china@ansmann.de

Sweden

ANSMANN Nordic AB

Address:

Victor Hasselblads Gata 11, 421 31 Västra Frölunda, Sweden  
nordic@ansmann.de

### **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.



# Material - Safety - Data Sheet (MSDS)

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

No.4

2/7

## 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)                                             | 2 - 5%   | 7439-93-2  |   | F;C<br>R14/15; R34<br>S43C; S45; S8                        |
| Manganese Dioxide (MnO <sub>2</sub> )                    | 15 - 45% | 1313-13-9  |                                                                                    | Xn<br>R20/22<br>S25                                        |
| Propylene Carbonate                                      | <10%     | 108-32-7   |                                                                                    | Xi<br>R36<br>S24/25                                        |
| 1,2-Dimethoxyethane                                      | <10%     | 110-71-4   |   | F;T<br>R11; R19; R20; R60; R61<br>S45; S53                 |
| Lithium trifluoromethyl sulfonate (only Photo Batteries) | <5%      | 33454-82-9 |                                                                                    | Xi<br>R36/37/38<br>S26; S37/39                             |
| Lithium Perchlorate (only Button Cells)                  | <1%      | 7791-03-9  |   | O; Xn<br>R20/22; R36/37/38; R9<br>S17; S26; S27; S36/37/38 |
| Graphite, synthetic (only Button Cells)                  | 3 - 10%  | 7440-44-0  |                                                                                                                                                                     | S22; S24/25                                                |
| stainless steel                                          | 30 - 75% | 7439-89-6  |                                                                                                                                                                     |                                                            |
| plastic                                                  | 0 - 10%  |            |                                                                                                                                                                     |                                                            |

### Weight of metallic lithium per cell:

|                 |                |                |               |                     |
|-----------------|----------------|----------------|---------------|---------------------|
| CR1025: 0.008 g | CR1620: 0.02 g | CR2032: 0.07 g | CR2450: 0.18g | CR123: 0.6 g        |
| CR1216: 0.008 g | CR1632: 0.04 g | CR2330: 0.08 g | CR2477: 0.29g | CR2: 0.33 g         |
| CR1220: 0.01 g  | CR2016: 0.03 g | CR2354: 0.17 g | CR3032: 0.15g | <b>per battery:</b> |
| CR1616: 0.02 g  | CR2025: 0.05 g | CR2430: 0.09 g | CR1/3N: 0.06g | CR-V9: 1.36 g       |

## 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. Lifting 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. |

## 5. Product and Supplier Identification

CO<sub>2</sub> extinguishers or, even preferably, copious quantities of water or water-based foam, can be used to cool down burning Li- MnO<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-MnO<sub>2</sub> cells or batteries and class D fire extinguishing agent only on raw lithium.



# Material - Safety - Data Sheet (MSDS)

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

No.4

3/7

## 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





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

No.4

4/7

**9. Physical and Chemical Properties**

|                            |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| <b>Appearance:</b>         | cylindrical shape                                                      |
| <b>Odour:</b>              | not applicable; unless in case of leakage, then smell of ether appears |
| <b>Flash Point:</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                   |

**10. Stability and Reactivity**

Product is stable under conditions described in Section 7.

|                                           |                                                                                                                                                      |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conditions to avoid:</b>               | Heat above 100° or incinerate. Deform. Mutilate. Crush. Pierce. Disassemble. Recharge. Short circuit. Expose over a long period to humid conditions. |
| <b>Materials to avoid:</b>                | Oxidising agents, alkalis, water.                                                                                                                    |
| <b>Hazardous reactions:</b>               | Lithium metal reacts with water to produce highly flammable gases                                                                                    |
| <b>Hazardous decomposition reactions:</b> | Toxic fumes, and may form peroxides                                                                                                                  |

**11. Toxicological Information**

|                                                   |                                                                                                                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Signs &amp; symptoms:</b>                      | None, unless battery ruptures. In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.                           |
| <b>Inhalation:</b>                                | Lung irritant                                                                                                                                                     |
| <b>Skin contact:</b>                              | Skin irritant                                                                                                                                                     |
| <b>Eye contact:</b>                               | Eye irritant                                                                                                                                                      |
| <b>Ingestion:</b>                                 | Poisoning if swallowed                                                                                                                                            |
| <b>Medical conditions aggravated by exposure:</b> | 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**

|                            |                                            |
|----------------------------|--------------------------------------------|
| <b>Mammalian effects:</b>  | None known if used / disposed of correctly |
| <b>Eco-toxicity:</b>       | None known if used / disposed of correctly |
| <b>Environmental fate:</b> | 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.





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

No.4

6/7

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 (2015): 2.2.9.1.7 (e)
- IATA (57<sup>th</sup> edition): 3.9.2.6 (e)
- IMDG-Code (Amendment 37-14): 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<br>R34                   | Reacts violently with water, liberating extremely flammable gases.<br>Causes burns.                                                                                                                                                                                                                                 |
| Manganese-Dioxide                 | R20/22                             | Harmful by inhalation and if swallowed                                                                                                                                                                                                                                                                              |
| Lithium Perchlorate               | R8<br>R36/37/38                    | Contact with combustible material may cause fire.<br>Irritating to eyes, respiratory system and skin.                                                                                                                                                                                                               |
| Propylene Carbonate               | R36                                | Irritating to the eyes.                                                                                                                                                                                                                                                                                             |
| 1,2 Dimethoxyethane               | R11<br>R19<br>R20                  | Highly flammable.<br>May form explosive peroxides<br>Harmful by inhalation                                                                                                                                                                                                                                          |
| Lithium Trifluoromethyl sulfonate | R36/37/38                          | Irritating to eyes, respiratory system and skin.                                                                                                                                                                                                                                                                    |
| Lithium Perchlorate               | R20/22<br>R36/37/38<br>R9          | Harmful by inhalation and if swallowed<br>Irritating to eyes, respiratory system and skin.<br>Explosive when mixed with combustible material                                                                                                                                                                        |
| substance                         | Safety Phrases                     |                                                                                                                                                                                                                                                                                                                     |
| Lithium (Li)                      | S1/S2<br>S8<br>S43<br>S45          | Keep locked up and out of reach of children<br>Keep container dry.<br>In case of fire, use Lith-X (Graphite based) fire extinguisher.<br>Never use water.<br>In case of accident or if you feel unwell, seek medical advice immediately.                                                                            |
| Manganese Dioxide                 | S25                                | Avoid contact with eyes.                                                                                                                                                                                                                                                                                            |
| Lithium Perchlorate               | S17<br>S26<br>S27<br>S36/37<br>S38 | Keep away from combustible material.<br>In case of contact with eyes, rinse immediately with plenty of water and seek medical advice<br>Take off immediately all contaminated clothing<br>Wear suitable protective clothing and gloves.<br>In case of insufficient ventilation wear suitable respiratory equipment. |
| 1,2 Dimethoxyethane               | S45<br>S53                         | In case of accident or if you feel unwell seek medical advice immediately.<br>Avoid exposure - obtain special instructions before use                                                                                                                                                                               |
| Propylene Carbonate               | S24/25                             | Avoid contact with skin and eyes.                                                                                                                                                                                                                                                                                   |
| Lithium trifluoromethyl sulfonate | S26<br>S37/39                      | In case of contact with eyes, rinse immediately with plenty of water and seek medical advice<br>Wear suitable gloves and eye/face protection                                                                                                                                                                        |
| Graphite, synthetic               | S22<br>S24/25                      | Do not breathe dust<br>Avoid contact with skin and eyes                                                                                                                                                                                                                                                             |



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

No.4

7/7

**16. 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.

This information relates to the specific materials designated and may not be valid for such material used in combination with any other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his particular use. ANSMANN AG does not accept liability for any loss or damage that may occur, whether direct, indirect, incidental or consequential, from the use of this information. Ansmann AG does not offer warranty against patent infringement.