



# SAFETY DATA SHEET

## Lithium Metal Batteries

(Lithium-Manganese-Dioxide Photo batteries)



Date of issue: 2009-02-04

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 compiled. ANSMANN makes no warranty expressed or implied.

### 1. IDENTIFICATION

#### 1.1 Product

Non-rechargeable Li-MnO<sub>2</sub> batteries (Mercury free)  
 Trade name and model: CR123, CR2, CR-P2, 2CR5  
 IEC designation: CR.... According IEC 285  
 Electrochemical system: Lithium Manganese Dioxide (Li-MnO<sub>2</sub>)

#### Electrodes:

Positive: Manganese Dioxide  
 Negative: Lithium  
 Electrolyte: Ethylene Carbonate, Butylene Carbonate, Dimethoxyethane  
 Nominal voltage: 3,0Volts

#### 1.2 Supplier 16

Name: ANSMANN AG  
 Address: Industriestraße 10, 97959 Assamstadt  
 Tel/Fax: + 49 62 94 42 04 0 / + 49 62 94 42 04 44  
 Emergency contact: ANSMANN local dealer

### 2. Hazardous Ingredients / Identify Information

IMPORTANT NOTE: The product is a manufactured article as described in 29 CFR 1910.1200. The battery cell is contained in a hermetically-sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances. The following information is provided for the user's information only.

Chemical Name	CAS No.	% / wt	ACGIH TLV (mg/m3)	Classification / Hazard Labeling
Manganese Dioxide	1313-13-9	30 – 45	Mn: 0,2	Specific hazards
Lithium metal	7439-93-2	2,5 – 4	none established	Water forbiddance
Ethylene Carbonate	96-49-1	} 8 - 15	none established	Combustibility
Butylene Carbonate	4437-85-8		none established	Inflammable
Dimethoxyethane	110-71-4		none established	Inflammable
Lithium trifluoro methane sulphonate (LiCF <sub>3</sub> SO <sub>3</sub> )	33454-82-9		none established	

shell: stainless steel



# SAFETY DATA SHEET

## Lithium Metal Batteries

(Lithium-Manganese-Dioxide Photo batteries)



### 3. Physical Data

Boiling Point (°C) PC-242, DME-85	Vapour Pressure (mm HG) PC-0.03, DME-61	Vapour Density (Air=1) DME-3.1
Melting Point (°C) Li-179, MnO <sub>2</sub> -decomposes at 535, LiCl <sub>4</sub> -236	Evaporation Rate (Butyl-Acetate=1) DME-4.99	Specific Gravity (H <sub>2</sub> O=1) MnO <sub>2</sub> -5.03, PC-1.20, DME-0.87 Li-0.54, LiClO <sub>4</sub> -2.43
Solubility in Water DME-complete, PC-moderate	Appearance and Odour Lithium is a soft, silvery metal; MnO <sub>2</sub> is a black powder PC is a colourless, odourless liquid DME is a colourless liquid with a sweet odour	

### 4. Fire and Explosion Hazard Data

Flash Point(°C):	DME: -1
Flammable Limits:	not available
Extinguishing Media:	for surrounding area: dry chemical, alcohol foam, water or carbon dioxide for incipient fires: carbon dioxide extinguishers are more effective than water
Fighting Procedures:	Cool fire-exposed batteries and adjacent structures with water spray from a distance Use self-contained breathing apparatus and full protective gear

Special Fire Explosion Hazards: Like any sealed container, battery cells may rupture when exposed to excessive heat. This could result in the release of flammable or corrosive materials

### 5. Reactivity Data / Hazards Identification

The batteries are stable under normal operating conditions.

Conditions to avoid:	Do not short circuit, recharge, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the temperature range of the battery. Thermal degradation may produce hazardous fumes of Manganese and Lithium, oxides of Carbon and other toxic by-products
Incompatible materials:	Contents incompatible with strong oxidizing agents
Hazardous reactions:	Lithium metals reacts with water to produce highly flammable gases
Hazardous decomposition reactions:	Toxic fumes, and may form peroxides
Hazardous decomposition products:	Thermal degradation may produce hazardous fumes of Manganese and Lithium; oxides of Carbon and other toxic by-products

### 6. 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



# SAFETY DATA SHEET

## Lithium Metal Batteries

(Lithium-Manganese-Dioxide Photo batteries)



Eye contact: Eye irritant

Ingestion: Poisoning 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

### 7. Health Hazard Data / First Aid Measures

Threshold Limit Values: See Section 2

Effects of Overexposure: None (In fire or rupture situation see section 2 and section 4)

Inhalation: During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach in the battery cell case, exposure to the constituents may occur.

Ingestion: If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.

Skin Absorption: No evidence of adverse effects from available data.

Skin Contact: Exposure to the electrolyte contained inside the battery may result in chemical burns.

Eye Contact: Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

Emergency and First Aid Procedures:

Ingestion: Harmful or poisoning if swallowed. Do not induce vomiting. Seek medical attention immediately.

Skin: If the internal cell materials of an opened battery cell comes into contact with the skin, immediately flush with water for at least 15 minutes. Remove contaminated clothing and wash before reuse. In severe cases obtain medical attention.

Inhalation: If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

Eyes: If the contents from an opened battery comes into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

### 8. Spill and Leak Procedures

Steps to be taken if material is released to the environment or spilled in the work area:  
Evacuate the area and allow vapours to dissipate. Increase ventilation. Avoid eye and skin contact. Do not inhale vapours. Clean-up personnel should wear appropriate protective gear. Remove spilled liquid with absorbent and contain for disposal.

Reporting Procedure:  
Report all spills in accordance with Federal, State and Local reporting requirements.

Waste disposal method:  
Open cells should be disposed of in accordance with local regulations



# SAFETY DATA SHEET

## Lithium Metal Batteries

(Lithium-Manganese-Dioxide Photo batteries)



### 9. Safe Handling and Storage

Handling: Do not short circuit or expose to temperatures above the temperature rating of the battery. Do not recharge, over-discharge, force discharge, immerse, puncture or crush. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag. Install batteries in accordance with equipment instructions.

Storage: Store in a cool place but prevent condensation on cells and batteries. Elevated temperatures can result in shortened battery life and degrade performance. Do not store batteries in high humidity environments for long periods.

### 10. Recycling and Disposal

Lithium batteries are best disposed of as a non-hazardous waste when fully or mostly discharged. The Federal Environmental Protection Agency (EPA) does not list or exempt Lithium as a hazardous waste. However, if waste Lithium batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of non-reacted, or unconsumed Lithium remaining in the spent battery. Such batteries may qualify as "Universal Waste" in many jurisdictions within the U.S. and thus can be shipped for disposal or recycling in accordance with Universal Waste requirements. Use a professional disposal firm for disposal of mass quantities of non-discharged Lithium batteries.

DO NOT INCINERATE or subject cells to temperatures in excess of 212°F. Such treatment can cause cell rupture.

### 11. Transportation

Ansmann Lithium Metal cells and batteries are excepted from the requirements of UN3090/UN3091 transport regulation, as the Lithium content is lower than the defined limits.

Each Ansmann cell or battery has been type tested under provisions of the UN Manual of Tests and Criteria, Part III, Sub-section 38.3.

If Ansmann Lithium cells are used to construct battery packs, the assembler of that pack is responsible to ensure the battery has been tested in accordance with the requirements contained in the UN Manual of Tests and Criteria and shipped in accordance with applicable regulations.

All Ansmann Lithium Metal Cells and Batteries can be shipped by air in accordance with International Civil Aviation Organization (ICAO), section II or International Air Transport Association (IATA), Part 1 Packing Instructions PI968 (batteries), PI969 (batteries, packed with equipment) and PI970 (batteries, contained in equipment) as appropriate.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Ansmann AG makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.