Material - Safety - Data Sheet (MSDS)

for

Ansmann Alkaline (Manganese Dioxide) Button Cells

single cells and multi-cell batteries

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Section 1 Product and Supplier Identification

Trade name:	Primary zinc / manganese dioxide battery; button cell primary alkaline button cell
Models / types:	LR44; LR43; LR54; LR41; LR9; A10; A11; A23; A27; A29; 4LR44
Electrochemical system:	Zinc - MnO_2 (Manganese Dioxide) - KOH / NaOH Electrolyte
Anode (negative electrode):	Zinc
Cathode (positive electrode):	Manganese Dioxide

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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 ist 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.

Legal remark (EU)
These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006EC. Instead they have to be rarded 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 Hazards 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 below 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

3.1 Substances

Not applicable

3.2 Mixtures

Important Note: The battery should not be opened or exposed to heat because exposure of the following ingredients contained within could be harmful under some circumstances

Hazardous substances contained in the product according to UN-GHS:

Ingredients	Content	CAS No.	Hazard Categories	Hazard Statements
Manganese Dioxide (MnO_2)	15 - 42%	1313-13-9	Acute Tox. 4	H302, H332
Zinc (Zn)	4 - 18%	7440-66-6	Aquatic Chronic 1	H410
Potassium Hydroxide (KOH)	2 - 6%	1310-58-3	Acute Tox. 4 Skin Corr. 1A	H302, H314
Sodium Hydroxide (NaOH)	0 - 0.5%	1310-73-2	Acute Tox. 4 Skin Corr. 1A	H302, H314

Full text of Hazard Statements: see chapter 16

Heavy Metals

Lead (Pb) see chapter no.12	< 0.00004%	7439-92-1		
Cadmium (Cd) see chapter no.12	< 0.002%	7440-43-9		
Mercury (Hg) see chapter no.12	< 0.0005%	7439-97-6		

Other ingredients

Stainless steel (Fe)	30 - 80%	65997-19-5		
Graphite (C)	2 - 4%	7782-42-5	Eye Irrit. 2A; STOT SE3	H228, H319, H335
Plastics, paper, water	10 - 20%			

Section 4 First Aid Measures

None, unless internal material exposure

4.1 Description of necessary first aid measures

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. Drink plenty of water. Seek medical attention immediately.

Inhalation: If battery is leaking, contents may be irritating to respiratory passages. Move to fresh air. If irritation persists, seek medical advice.

Further treatment: All cases of eye contamination, persistent skin irritation and casualities who have swallowed this substance or been affected by breathing its vapours should be seen by a doctor.

4.2 Most important symptoms / effects, acute and delayed

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.
See emergency phone number in section 1.

In case of exposure to inner components/material of the battery:
Harmful if swallowed (Manganesedioxide, electrolyte)
Harmful if inhalated (Manganesedioxide)
May cause damage to organs (brain) through prolonged or repeated exposure (inhalation) (Manganesedioxide)

4.3 Indication of immediate medical attention and special treatment needed

No further information available.

Section 5 Fire Fighting Measures

Fire and explosion hazards
Batteries may burst and release hazardous decomposition products when exposed to a fire situation.

5.1 Suitable extinguishing media

Use foam, water, carbon dioxide (CO_2), as appopriate

5.2 Specific hazards arising from the chemical

Thermal degradation may produce hazardous fumes of zinc and manganese, hydrogen gas, caustic vapors of potassium(sodium) hydroxide and other toxic by-products

5.3 Special protective actions for firefighters

Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing.
Fight fire from a distance or protected area.

Section 6 Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Steps to be taken in case material is released or spilled:
The preferred response is to leave the area and allow batteries to cool and the vapours to disssipate.
Avoid skin and eye contact or inhalation of vapours.

6.2 Environmental precautions

Do not allow product to reach sewage system or any water course
In the event of spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

6.3 Methods and material for containment and cleaning up

In the event of spill or accidental release, collect all released material in a plastic lined metal container and remove spilled liquid with absorbent. Doing this, protect your skin and eyes with chemical resistant protective (EN374) and tightly sealed protective googles (EN166). Avoid direct contact with internal components.

Section 7 Precautions for safe Handling and Storage

When used correctly, alkaline batteries provide a safe and dependable source of power. However, if they are misused or abused, leakage, heating or in extreme case, explosion may result. Therefore pay attention to the following recommendations:

7.1 Storage:
Store batteries in a dry place at normal room temperature.
Do not refrigerate – this will not make them last longer.
Elevated temperatures can result in shortened battery life. Temperautes above 100°C may result in battery leakage and rupture.
Storage of unpacked batteries can cause electrical short circuit and heat generation. Avoid large temperature changes and direct sunlight.

7.2 Storage of big quantities:
If possible, store the batteries in the original packaging.
A fire alarm is recommended.
For automatic fire extinguisher consider chapter 5 "Fire Fighting Measures"

7.3 Handling:
Avoid mechanical or electrical abuse. DO NOT short circuit or install incorrectly.
Install batteries in accordance with equipment instructions.
Do not carry batteries loose in a pocket or bag.
Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access.
Do not swallow batteries.
Do not throw batteries into fire.
Do not throw batteries into water.
In case of battery change always replace all batteries by new ones of identical type and brand.

7.4 Charging:
Do not charge this batteries! This battery type is manufactured in a ready-to-use-state. It is not designed for recharging.

7.5 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

n/a*: not applicable for closed batteries

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.
Hazardous decomposition products:	Thermal decomposition may produce hazardous fumes of zinc and manganese; caustic vapors of potassium hydroxide and other toxic by-products.
Hazardous polymerization:	Will not occur.

Section 11 Toxicological Information

Potential Health Effects:	The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused. Damaged battery will release concentrated potassium hydroxide, which is caustic.
Inhalation:	Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.
Skin contact:	Contact with battery contents may cause severe irritation and burns.
Eye contact:	Contact with battery contents may cause severe irritation and burns. Eye damage is possible.
Ingestion:	Swallowing of Alkaline button cells is possible and can be harmfull.
Acute Toxicity Data:	Manganese Dioxide: LD50 oral rat >3478 mg/kg Potassium Hydroxide: LD50 oral rat 273 mg/kg
Chronic Effects:	The chemicals in this product are contained in a sealed can and exposure does not occur during normal handling and use. No chronic effects would be expected from handling a leaking battery.
Target Organs:	Skin, eyes and respiratory system.
Carcinogenicity:	None of the components of this product are listed as carcinogens by the EU Directive on the classification and labeling of substances.

Section 12 Ecological Information

ANSMANN Alkaline (zinc-manganese-dioxide) button cells described in this MSDS do not contain heavy metals as defined by the European Directive 2006/66/EC Article 21; they comply with the chemical composition requirements of this directive.

Mercury has not been "intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)" in the sense of the USA "Mercury-Containing and Rechargeable Battery Management Act" (May 13 1996).

The Regulation on Mercury Content Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines 'low mercury' as 'mercury content by weight in battery as less than 0.025%' , and mercury free' as 'mercury content by weight in battery as less than 0.0001%'. And therefore: Ansmann zinc / manganese (alkaline) cells/batteries belong to the category of mercury-free battery (mercury content lower than 0.0001%).

Section 13 Disposal Considerations

USA: Alkaline (zinc-manganese-dioxide) button cells/batteries are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. End-users may, however, go to te website of Call2Recycle, Inc. at www.call2recycle.org to obtain additional information for local options of collection and recycling.

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.

In order to avoid short circuit and heating, used zinc / manganese (alkaline) button cells should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals

Section 14 Transport Information

14.1 General considerations
Alkaline (zinc-manganese-dioxide) button cells cells/batteries are considered to be "dry cell" batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civic Aviation Administration (ICAO), International Air Transport Association (IATA), the International Maritime Organization (IMO), the "Accord Europeèn Relatif au Transport International des Merchandises Dangereuses par Route" (ADR) and the "Règlement concernant le transport international ferroviaire de marchandises Dangereuses" (RID).
All Ansmann alkaline button cells are packed in such a way to prevent short circuits or the generation dangerous quantities of heat and meet the special provisions listed below.

14.2 IATA DGR:
Special Provision A123: "Examples of such batteries are: alkali-manganese, zinc-carbon and nickel-cadmium batteries. Any electrical battery…having the potential of a dangerous evolution of heat must be prepared for transport as to prevent:
(a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals…)
(b) an accidential activation
The words “Not Restricted” and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.

14.3 EU: ADR / RID / IMDG Code:
As primary zinc/manganese dioxide batteries/cells are not explicitly mentioned in these Dangerous Goods regulations, there are no special Dangerous Goods spipment requirements for these products.

14.4 USA: 49 CFR § 172.102 Special Provision 130:
USA: 49 CFR § 172.102 Special Provision 130: "For other than a dry battery specifically covered by another entry in the § 172.101. table, "Batteries, dry" are not subject to the requirements of this subchapter when they are securely packaged and offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals) and protects against short-circuits".

14.5 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.

Section 15 Regulatory Information

Marking consideration:

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 primary zinc-manganese batteries have to be marked with the crossed bin.

International safety standard:

IEC 60086-5:
"….system L button cells or batteries under 250mAh capacity….
are exempt from any testing".

US DOT:
Alkaline button cells marketed by ANSMAN are not classified as dangerous goods by the US Department of Transportation or the major international regulatory bodies and are therefore not regulated

Water hazard class:

(according to German Federal Water Management Act)
non-water pollution according to VwVwS Appendix 1 (no.1443 and 766)

Section 16 Other Information

Full text of Hazard Statements referred to uner section 3

Pictograms acc. GHS

H302	Harmful if swallowed
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H314	Causes severe skin burns and eye damage
H410	Very toxic to aquatic life with long lasting effects
H228	Flammable solid

Abbreviations

Acute Tox. 4	Acute toxicity, Hazard category 4
Aquatic Chronic 1	Long-term aquatic hazard, chronic 1
Skin Corr. 1A	Skin corrosion, category 1A
Eye Irrit. 2A	Serious eye irritation, category 2A
STOT SE 2	Specific target organ toxicity - single exposure, category 2

Note:

Date of issue of the transport regulations: ADR 2021; RID 2021, IATA 2021 (62nd edition), IMDG 2021 / 40-20, DOT / CFR 2020
Latest covered modification of the European Battery Directice 2006/66/EC: Directive 2013/56/EU

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