Safety Data Sheet MSDS 2.001.003
Primary Alkaline Manganese Cylindrical Cell

1 Identification of the product and of the company

Product details

Trade name	Primary Alkaline cylindrical
Electrochemical system:	MnO_2 | KOH | Zinc
Anode (negative):	Zinc
Cathode (positive):	Manganese dioxide

This MSDS applies to the following cell and battery types.

Type	IEC designation	Nominal voltage
AAA	LR03	1.5 V
AA	LR6	1.5 V
C	LR14	1.5 V
D	LR20	1.5 V
9V	6LR61	9.0 V

Supplier details

Address:	VARTA Microbattery GmbH VARTA-Platz 1 73479 Ellwangen Germany
Emergency Phone Number:	+49 7961 921 110 (VAC)

General remark

This information 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.

Legal remark (EU)

These batteries are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. 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) No 1907/2006, Article 31.

The headings used in this safety data sheet are in line with Annex II of Regulation (EC) No 1907/2006 as amended by Regulation (EU) 2020/878.

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 or 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.

2 Hazards identification

Sealed VARTA primary alkaline manganese cylindrical cells are not hazardous in normal use (as defined in section 7).

In case of mistreatment (prolonged deep discharge, abusive charge, reverse charge, external short circuit...) and in case of fault, some electrolyte can leak from the cell through the sealing system. In these cases refer to the risk of potassium hydroxide solution (corrosive, pH > 14). Charging may cause rupture. The electrode materials are only hazardous, if the materials are released by mechanical damaging of the cell or if exposed to fire.

3 Composition/information on ingredients

Ingredients

Content	CAS no.	EC no.	Material	Hazard Categories	Hazard Statements
20 – 40 %	1313-13-9	215-202-6	Manganese dioxide	Acute Tox. 4	H302, H332
15 – 27 %	proprietary	proprietary	Steel and nickel		
10 – 19 %	7440-66-6	231-175-3	Zinc	Aquatic Chronic 1	H410
4 – 7 %	1310-58-3	215-181-3	Potassium hydroxide	Acute Tox. 4, Skin Corr. 1A	H302, H314
2 – 6 %	proprietary	proprietary	Polymers		
< 0.4 %	1310-73-2	215-185-5	Sodium hydroxide	Acute Tox. 4, Skin Corr. 1A	H302, H314

For full text of hazard statements see section 16.

Substances relevant for Battery Directive 2006/66/EC

Content	CAS no.	EC no.	Material
< 0.0040 %	7439-92-1	231-100-4	Lead
< 0.0005 %	7440-43-9	231-152-8	Cadmium
< 0.0001 %	7439-97-6	231-106-7	Mercury (none intentionally introduced, see section 12)

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4 First-aid measures

After inhalation:	Fresh air. Seek for medical assistance.
After skin contact:	Remove solid particles immediately. Flush affected areas with plenty of water (at least 15 min). Remove contaminated cloth immediately. Seek for medical assistance.
After eye contact:	Flush the eye gently with plenty of water (at least 15 min). Seek for medical assistance.
After ingestion of battery components:	Drink plenty of water. Avoid vomiting. Seek for medical assistance. No trials for neutralization.

5 Fire-fighting measures

Suitable extinguishing media:	Use foam, dry powder or carbon dioxide (CO_2) as appropriate.
Extinguishing media with limited suitability:	Water is only applicable for incipient fire.
Special protection equipment during firefighting:	Firefighting clothing and self-contained breathing apparatus.
Special hazard:	(none)

6 Accidental release measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, cloth).
Environment protection measures:	In the event of cell rupture, prevent skin contact and collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.
Treatment for cleaning:	If cell casing is dismantled, small amounts of electrolyte may leak. Pack the cell or its remains including ingredients as described above. Then clean with water.

7 Handling and storage

Guideline for safe handling:	Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries. Do not recharge primary batteries. Do not open or disassemble batteries.

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Environmental conditions:	10 °C to 30 °C and 20 % to 80 % relative humidity for storage –10 °C to 65 °C and 5 % to 95 % relative humidity for short exposition (e.g. transport) Avoid large temperature changes. Do not store close to heating devices. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.
Storage category according to TRGS 510:	It is recommended to consider the "Technical Rule for Hazardous Substances TRGS 510 - Storage of hazardous substances in nonstationary containers" and to handle VARTA primary alkaline manganese cylindrical cells according to storage category 11 ("combustible solids").
Storage of large amounts:	If possible, store the batteries in original packaging (short circuit protection). A fire alarm is recommended. For automatic fire extinction consider section 5.

8 Exposure controls/personal protection

Under normal conditions (discharge) release of ingredients does not occur. Avoid prolonged deep discharge.

9 Physical and chemical properties

Not applicable if closed.

10 Stability and reactivity

Dangerous reactions:	When heated above 70 °C the risk of rupture occurs.

11 Toxicological information

Under normal conditions (discharge) release of ingredients does not occur. Avoid prolonged deep discharge. If accidental release occurs see information in sections 2 to 4 and 6.

Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up. See section 4.

12 Ecological information

VARTA primary alkaline manganese cylindrical cells do not contain heavy metals as defined by the European directives 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 U.S.A. "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: VARTA primary alkaline manganese cylindrical cells belong to the category of mercury-free battery (mercury content lower than 0.0001 %).

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13 Disposal considerations

In order to avoid short circuit and heating, used VARTA primary alkaline manganese cylindrical 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
- Embedding in dry sand

European Union

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 on batteries and accumulators and waste batteries and accumulators. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (www.epbaeurope.net).

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

USA

VARTA primary alkaline manganese cylindrical cells are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by Call2Recycle, Inc. Please go to their website at www.call2recycle.org for additional information.

14 Transport information

General considerations

VARTA primary alkaline manganese cylindrical cells 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 Européen Relatif au Transport International des Marchandises Dangereuses par Route (ADR) and the Règlement concernant le transport international ferroviaire de marchandises Dangereuses (RID).

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."

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. … by the effective insulation of exposed terminals…); and (b) accidental 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."

ADR/RID/IMDG Code

As primary alkaline cells are not explicitly mentioned in these Dangerous Goods regulations, there are no special Dangerous Goods shipment requirements for these products.

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49 CFR §172.102 Special Provision 130: "Dry batteries not specifically covered by another entry in the §172.101 Table are covered by this entry (i.e., Batteries, dry, sealed, n.o.s.) and are not subject to requirements of this subchapter except for the following: [...] (b) Preparation for transport. Batteries and battery-powered device(s) containing batteries must be prepared and packaged for transport in a manner to prevent: (1) A dangerous evolution of heat; (2) Short circuits, including but not limited to the following methods: [...] (ii) Separating or packaging batteries in a manner to prevent contact with other batteries, devices or conductive materials (e.g., metal) in the packagings [...]; and (3) Damage to terminals. If not impact resistant, the outer packaging should not be used as the sole means of protecting the battery terminals from damage or short circuiting. Batteries must be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short circuits."

15 Regulatory information

Marking consideration (EU)

VARTA Primary Alkaline Manganese Cylindrical Cell conform to the requirements of the EU Battery Regulation (EU) 2023/1542 and are thus marked with the CE symbol from August 18, 2024.

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 alkaline cylindrical cells/batteries of size LR6, LR14, LR20, and 6LR61 have to be marked with the crossed bin on the battery casing, those of size LR03 have to be marked with the crossed bin on the packaging.

Marking consideration (USA)

The casing of VARTA primary alkaline manganese cylindrical cells is made out of Nickel plated steel. For the exposition to Nickel no safe-harbour level is given in California Proposition 65, officially known as the Safe Drinking Water and Toxic Enforcement Act of 1986. Therefore the following warning must be given to customers in the State of California: "WARNING: This product can expose you to chemicals including nickel, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov." The warning must be given together with a triangular yellow warning symbol.

Water hazard class

The regulations of the German Federal Water Management Act (WHG) are not applicable as VARTA primary alkaline manganese cylindrical cells are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled.

16 Other information

Full text of Hazard Statements referred to under section 3:

Code	Phrase
H225	Highly flammable liquid and vapour.
H228	Flammable solid.
H250	Catches fire spontaneously if exposed to air.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H271	May cause fire or explosion; strong oxidiser.
H272	May intensify fire; oxidiser.

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Code	**Phrase** (continued)
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H350	May cause cancer
H350i	May cause cancer by inhalation.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H360D	May damage the unborn child.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

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Covered regulations:	Latest covered modifications of transport regulations: • Air: IATA DGR 2024 (65th edition) • Road: ADR 2023 • Sea: IMDG Code 2022 (inc. Amdt. 41-22) • Rail: RID 2023 Latest covered modification of the European Battery Regulation (2023/1542):
RoHS:	See special Declaration
REACH:	See special Declaration
Issued by:	VARTA Microbattery GmbH Product Compliance
Contact:	https://www.varta-ag.com/en/about-varta/contact VARTA Microbattery GmbH VARTA-Platz 1, 73479 Ellwangen info@varta-microbattery.com +497961 921-0
Updates:	Current SDS can be downloaded from VARTA's web page https://www.varta-ag.com/en/industry/product-solutions

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