
Primary zinc/silver oxide button cell, mercury free (series V... MF)

1. Identification of the product and of the company undertaking

Product details

Trade name:	Primary Silver oxide battery: button
Voltage:	1,55 V (or multiples of this in case of multi-cell configurations)
Electrochemical system:	Zinc NaOH/KOH electrolyte silver oxide, manganese dioxide
Anode (negative electrode):	Zinc
Cathode (positive electrode):	Silver oxide, manganese dioxide

Supplier details

Address:	VARTA Microbattery GmbH Daimlerstr. 1 D-73479 Ellwangen/Jagst Germany
Emergency telephone number:	+49 7961 921 110 (VAC)

Legal Remark (U.S.A.)

Material Safety Data Sheets (MSDS) 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". OSHA has defined "article" as 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, 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 "preparations" 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 MSDS according to Regulation (EC) 1907/2006, Article 31.

General remark

This "Safety 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.

2. Hazards identification

A sealed zinc/silver oxide button cell is not hazardous in normal use (as defined in chapter 7).

In case of mistreatment (prolonged deep discharge, charge, reverse charge, external short circuit...) and in case of fault, some electrolyte can leak from the cell. In these cases refer to the risk of potassium hydroxide solution or sodium 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

Contents	CAS No.	Classification	R Phrases	Material
5 – 35 %	20667-12-3	O; Xi;	8 41	Silver oxide
0 – 20 %	1313-13-9	Xn;	20/22	Manganese dioxide
5 – 10 %	7440-66-6	N	50/53	Zinc
0 – 3 %	1310-58-3	Xn; C;	22 35	Potassium hydroxide
0– 2 %	1310-73-2	C;	35	Sodium hydroxide
0,01 - 0,06 %	7439-92-1	Repr. Cat. 1; Repr. Cat. 3; Xn; N;	61 62 20/22 33 50/53	Lead

Full text of Classification and R-phrases see section 16.

Heavy Metals

Contents	CAS No.	Material
< 5 mg/kg	7440-43-9	Cadmium
< 5 mg/kg	7439-97-6	Mercury (none intentionally introduced, see Chapter 12)

Other Ingredients

Contents	CAS No.	Material
27 - 70 %		Nickel plated steel
2 - 5 %		Copper
2 - 7 %		Polymers

4. First aid measures

Measures at accidental release

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

5. Fire fighting measures

Suitable extinguishing media:	Use foam, water, or CO ₂ , as appropriate.
Extinguishing media with limited suitability:	(none)
Special protection equipment during fire-fighting:	Contamination cloth including 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 battery 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 battery casing is dismantled, small amounts of electrolyte may leak. Pack the battery including ingredients as described above. Then clean with water (diluted acetic acid may be helpful).

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. Do not short-circuit batteries. Do not recharge primary batteries.
Storage:	Storage preferably at room temperature (approx. 20 °C). Avoid large temperature changes. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.
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 chapter 5 "Fire fighting measures".
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 primary zinc/ nickel oxide hydroxide button cells according to storage category 11 ("combustible solids").

8. Exposure controls/personal protection

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

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 (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 2, 3, and 4.

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

12. Ecological information

Primary zinc/silver oxide button cells do contain lead, and do not contain mercury and cadmium as defined by the European directive 2006/66/EC Article 21.

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 zinc/silver oxide button cells belong to the category of low-mercury battery (mercury content lower than 0.025%).

13. Disposal considerations

USA: Primary zinc/silver oxide button cells are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream.

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 law and rules.

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

Storage of batteries in original packaging
Coverage of the terminals

14. Transport information

VARTA primary zinc/silver oxide button cells are considered to be "dry cell" batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civil 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)..

IATA DGR: Special Provision A123: *"Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride 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...) is forbidden from transport; 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 zinc/silver oxide button cells are not explicitly mentioned in these Dangerous Goods regulations, there are no special Dangerous Goods shipment requirements for these products.

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."*

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.*

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 all batteries have to be marked with the crossed bin; according to Article 21 of this directive primary zinc/silver oxide button cells have to be marked with the element symbol "Pb". Due to the size of the products the battery need not be marked but a symbol (crossed bin plus "Pb") measuring at least 1 × 1 cm shall be printed on the packaging.

International safety standards: IEC 60086-5.

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

16. Other information

Full text of Classification and R Phrases referred to under sections 2 and 3

Classification	Repr. Cat. 1	toxic for reproduction category 1
	Repr. Cat. 3	toxic for reproduction category 3
	Xn	Harmful
	Xi	Irritating
	O	Oxidising
	C	Corrosive
	N	Dangerous for the environment

R Phrases		
	8	Contact with combustible material may cause fire.
	20/22	Harmful by inhalation and if swallowed.
	22	Harmful if swallowed.
	33	Danger of cumulative effects.
	35	Causes severe burns.
	41	Risk of serious damage to eyes.
	50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
	61	May cause harm to the unborn child.
	62	Possible risk of impaired fertility.

Note: Date of issue of the transport regulations: ADR 2011, RID 2011, IATA 2012, IMDG 2010, DOT / 49 CFR 2012.

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