1. IDENTIFICATION

Trade name: **Primary Silver oxide battery: button cell (all sizes)**

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**

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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.

GHS Classification : N/A

3. COMPOSITION / INFORMATION on INGREDIENTS

Ingredients

Contents	CAS No.	Hazard Categories	Hazard Statements	Material
10 - 19 %	7440-66-6	Aquatic Chronic 1	H410	Zinc
5 – 35 %	20667-12-3	Ox. Sol. 1	H271	Silver oxide
		Eye Dam. 1	H318	
		Aquatic Acute 1	H400	
		Aquatic Chronic 1	H410	
24 - 40 %	1313-13-9	Acute Tox. 4	H302	Manganese dioxide
			H332	
4 - 7 %	1310-58-3	Acute Tox. 4	H302	Potassium hydroxide
		Skin Corr. 1A	H314	
0 - 0,4 %	1310-73-2	Acute Tox. 4	H302	Sodium hydroxide
		Skin Corr. 1A	H314	

Full text of Hazard statements: see section 16.

Heavy Metals

Contents	CAS No.	Material
< 5 mg/kg	7440-43-9	Cadmium
< 40 mg/kg	7439-92-1	Lead
< 1 mg/kg	7439-97-6	Mercury (none intentionally introduced, see Chapter 12)
< 5 mg/kg		Hexavalent Chromium (Cr^{6+})

Other Ingredients

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

4. FIRST AID MEASURES

Contact to internal battery content:

- **Skin:** Flush affected areas with plenty of water. Remove contaminated cloth immediately. Seek for medical assistance.
- **Eyes:** Flush the eye gently with plenty of water (at leaset 15 minutes). Seek for medical assistance.
- **Inhalation:** Fresh air. Seek for medical assistance.
- **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)

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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).

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7. HANDLING AND STORAGE

Guidline 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. Do not open or disassemble 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/silver oxide 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 ºC the risk of rupture occurs.

11. TOXIOLOGICAL INFORMATION

Under normal conditions (during 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

VARTA primary zinc/silver oxide button 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 zinc/silver oxide button cells belong to the category of mercury-free battery (mercury content lower than 0,0001 %).

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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 Battery 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

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14. TRANSPORT INFORMATION

Silver Oxide Batteries, which we supply to our customers are not subject to dangerous goods transport regulations due to following regulations:

Air transport: IATA **Dangerous Goods Regulations** 62nd Edition special provision A123
The shipping documents contain “Not restricted, as per Special Provision A123” in the Air Waybill (8.2.6 IATA-DGR)
Sea transport: IMDG Code 40. Amendment
Road and rail transport: ADR/RID 2021 (not restricted to ADR/RID)

All of these batteries are carefully packed and provide appropriate protection for prevention of short circuits

15. REGULATORY INFORMATION

Marking considerations: 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. Due to the size of the battery, this marking has to be placed on the packaging.
International safety standards:	IEC 60086-5
Water hazard class:	The regulations of the German Federal Water Management Act (WHG) are not applicable as primary zinc/silver oxide button cells are articles and not substances, thus there is no risk of water pollution, except the batteries are violated or dismantled.

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16. OTHER INFORMATION

Full text of Hazard Statements referred to under section 3:

H271	May cause fire or explosion; strong oxidizer
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H332	Harmful if inhaled
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects