

Safety data sheet according to 2006/66/EC

Edition: February 01, 2011 Version: 2 / Silver oxide

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/mercury | NaOH/KOH electrolyte | silver oxide, manganese dioxide

Anode (negative electrode): Zinc/mercury

Cathode (positive electrode): Silver oxide, manganese dioxide

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2. COMPOSITION / INFORMATION on INGREDIENTS

Ingredients

Contents	CAS No.	Hazard Symbols	R Phrases	Material
5 – 35 %	20667-12-3	O, C, Xi	R 8-34-44	Silver oxide
0 – 20 %	1313-13-9	Xn	R20/22	Manganese dioxide
5 – 10 %	7440-66-6	N	R50/53	Zinc
0 – 3 %	1310-58-3	C	R22-35	Potassium hydroxide
0– 2 %	1310-73-2	C	R35	Sodium hydroxide
0,15 – 0,5 % < 25 mg/cell	7439-97-6	T, N	R 23-33-50/53	Mercury (in zinc alloy)

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

Heavy Metals

Contents	CAS No.	Material
20 – 60 mg/kg	7439-92-1	Lead
< 5 mg/kg	7440-43-9	Cadmium

Other Ingredients

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

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3. 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.

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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 least 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.
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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

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"
VCI storage category:	It is recommended to consider the "VCI Guideline for the mixed storage of chemicals" and to handle primary zinc/silver button cells according to storage category 11 ("combustible solids")

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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

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9. PHYSICAL AND CHEMICAL PROPERTIES

Not applicable if closed.

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10. STABILITY AND REACTIVITY

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

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11. TOXIOLOGICAL INFORMATION

Under normal conditions 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.

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12. ECOLOGICAL INFORMATION

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

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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

14. TRANSPORT INFORMATION

The Silver Oxide Button Cells that we supply to our customers are not subject to dangerous goods transport regulations due to following regulations:

Air transport: IATA Resolution 52. Edition special provision 123

The shipping documents contain "Not restricted, as per Special Provision A123"

See transport: IMDG Code 32. Amendment special provision 304

Road and rail transport: ADR/RID 2011 special provision 304

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

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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; according to article 21 of this directive zinc/silver oxide button cells have to be marked with the element symbols "Hg" and "Pb". 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: (according to German Federal Water Management Act) non-water pollution according to VwVwS Appendix 1 (No. 1443 and 766)

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16. OTHER INFORMATION

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

Classification	Xn	Harmful
	T	Toxic
	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.
	23	Toxic by inhalation.
	33	Danger of cumulative effects.
	34	Causes burns.
	35	Causes severe burns.
	44	Risk of explosion if heated under confinement.
	50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.