Silver Oxide Batteries

High Drain Watch Batteries

Product Safety Data Sheet

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Disclaimer:
The batteries are exempt articles and are not subject to hazard Communication Standard Requirement. This sheet is provided as technical information only. The information contained in this Product Safety Data Sheet has been established to the best of RENATA SA's knowledge and belief. RENATA SA makes no representation and provides no warranty or guarantee regarding the contents of this Product Safety Data Sheet and excludes its liability, express or implied.

Section 1 - Product identification

1.1 Product identifier
Product Name: Primary High Drain silver Oxide Watch Batteries
Nominal Voltage: 1.55V
Electrochemical System: Zinc/KOH Electrolyte/Manganese dioxide
Sizes / Models: See section 3

1.2 Recommended use and restrictions on use
Recommended use: battery, no restrictions, see section 7 handling and storage.

1.3 Suppliers details
RENEATA SA
Kreuzenstrasse 30
CH-4452 ITINGEN / Switzerland
Tel: +41 61 975 75 75
Fax: +41 61 975 75 95
Mail: sales@renata.com

1.4 Emergency phone number
Swallowed a Button Battery? Battery in the Nose or Ear? : National Capital Poison Center
Call 1-202-625-3333 for guidance.
For other countries please contact the local Tox Centers
Section 2 - Hazard Identification

2.1 Classification of the substance or mixture

Classification according to UN-GHS

Batteries are considered as articles and 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.

Ox. Sol. 1  H271: May cause fire or explosion; strong oxidiser.
Eye Dam. 1   H318: Causes serious eye damage.
Skin Corr. 1B  H314: Causes severe skin burns and eye damage.
STOT RE 2   H373: May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation).
Aquatic Acute 1  H400: Very toxic to aquatic life.
Aquatic Chronic 1  H410: Very toxic to aquatic life with long lasting effects.

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 reach of children.

2.3 Other hazards which do not result in classification

The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety precautions in Section VII). No adverse effects expected in case of swallowing an intact silver battery (small diameter and low voltage). Swallowing a damaged battery leads to chemical burns, perforation of soft tissues. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately.
## Section 3 - Composition / Information 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:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No.</th>
<th>Content % of total weight</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cathode:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disilver Oxide (Ag2O)</td>
<td>20667-12-3</td>
<td>24 - 38</td>
<td>Oxid. Solid 1</td>
<td>H271, H318, H400 (M=100)**, H410 (M=100)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Damage 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Acute 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 1</td>
<td></td>
</tr>
<tr>
<td>Manganese Dioxide (MnO₂)</td>
<td>1313-13-9</td>
<td>2 - 16</td>
<td>Acute Tox. 4, Acute Tox. 4, STOT RE 2</td>
<td>H302, H332, H373 (Brain) (Inhalation)</td>
</tr>
<tr>
<td>Graphite (C)</td>
<td>7782-42-5</td>
<td>0.3 - 2</td>
<td>-</td>
<td>not classified</td>
</tr>
<tr>
<td><strong>Anode:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zink powder (Zn)</td>
<td>7440-66-6</td>
<td>8 - 12</td>
<td>Aquatic Acute 1</td>
<td>H400 (M=1)**, H410 (M=1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 1</td>
<td></td>
</tr>
<tr>
<td><strong>Electrolyte:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide (KOH)</td>
<td>1310-58-3</td>
<td>1 - 4</td>
<td>Acute Tox. 4, Skin Corr. 1A</td>
<td>H302, H314</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Models: 350, 357, 361, 370, 376, 380, 386, 389, 391, 392, 393, 396, 399
Brand name: RENATA

M: “M-factor’ means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present;’” (definition in regulation (EC) No 1272/2008)
Section 4 - First Aid Measures

None unless internal material exposure.

If contact with internal components, observe following instructions

4.1 Description of necessary first aid measures

Swallowing:
Contents of an opened battery can cause serious chemical burns of mouth, oesophagus, and gastrointestinal tract. Drink a plenty of water. Do not induce vomiting. Consult a physician immediately.

Inhalation:
Fumes of alkaline solution can cause respiratory irritation. Provide fresh air and consult a physician.

Skin contact:
Skin contact with contents of an opened battery causes severe skin burns. Remove contaminated clothing and wash skin with soap and water. Consult a physician immediately.

Eye contact:
Contents of an opened battery causes serious eye damage. Immediately flush eyes thoroughly with water for at least 15 minutes. Consult a physician immediately.

4.2 Most important symptoms / effects, acute and delayed

The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see Safety precautions in Section VII). 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 1.4 Emergency phone number

In case of exposure to inner component/material of the battery:
Causes serious eye damage. (Disilver Oxide (Ag2O))
Causes severe skin burns and eye damage. (Disilver Oxide (Ag2O), Potassium hydroxide (KOH))
May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation) (Manganese Dioxide)

4.3 Indication of immediate medical attention and special treatment needed

No further information available.
Section 5 - Fire Fighting Measures

5.1 Suitable extinguishing media
In case of fire, any class of extinguisher is effective.

5.2 Specific hazards arising from the chemical
When exposed to heat, the battery may rupture, release hazardous substances and emit hazardous fumes of alkaline.

5.3 Special protective actions for fire-fighters
Wear self-contained breathing apparatus and full gear to avoid inhalation and eyes or skin contact with harmful alkaline mist.
In case of major fire and large quantities, evacuate 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 the batteries to cool and the vapours to dissipate. 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 gloves (EN374, material: rubber) and tightly sealed protective googles (EN166). Avoid direct contact with internal components.
When used correctly, primary batteries provide a safe and dependable source of power. However, if they are misused or abused, leakage, venting, or in extreme cases explosion and/or fire may result.

7.1 Precautions for safe handling
- Do not insert batteries in reverse. Observe the polarity markings on battery and equipment
- Do not short-circuit batteries
- Do not charge batteries
- Do not force discharge batteries
- Do not mix old and new batteries or batteries of different types or brands
- Exhausted batteries should be immediately removed from equipment and properly disposed of
- Do not heat batteries by exposure to high temperatures and direct sunlight.
- Do not weld or solder directly to batteries
- Do not dismantle batteries
- Do not deform batteries
- Do not dispose of batteries in fire
- Keep batteries out of the reach of children. In case of ingestion of a cell or battery, the person involved should seek medical assistance promptly.
- Do not allow children to replace batteries without adult supervision
- Do not encapsulate and/or modify batteries
- Remove batteries from equipment if it is not to be used for an extended period of time unless it is for emergency purposes.

7.2 Conditions for safe storage, including any incompatibilities
The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and packaging design shall be chosen so as to prevent the development of unintentional electrical contact, corrosion of the terminals and some protection from the environment.
- Store unused batteries in their original packaging away from metal objects. If already unpacked, do not mix or jumble batteries.
- Batteries shall be stored in well-ventilated, dry and cool conditions
- Battery cartons should not be piled up in several layers (or should not exceed a specified height)
- When batteries are stored in warehouses or displayed in retail stores, they should not be exposed to direct sun rays for a long time or placed in areas where they get wet by rain
- Do not mix unpacked batteries so as to avoid mechanical damage and/or short-circuit among each other
- For normal storage, the temperature should be between +10°C and +25°C, and should never exceed +30°C (according to IEC 60086-5). Extremes of humidity (over 95% R.H. and below 40% R.H) for sustained periods should be avoided since they are detrimental to both batteries and packaging. Batteries should therefore not be stored next to radiators or boilers nor in direct sunlight.
Section 8 - Exposure Controls / Personal Protection

8.1 Control parameters
Occupational exposure limits are observed as long as the battery remains intact.

8.2 Appropriate engineering controls
Ventilation is not necessary under conditions of normal use.

8.3 Individual protection measures, such as personal protective equipment (PPE)
In case of exposure to inner component/material (i.e. when handling damaged batteries), protect your skin and eyes with chemical resistant protective gloves (EN374, material: rubber) and tightly sealed protective googles (EN166).

Respiratory protection (specify type): Not necessary under conditions of normal use.
Ventilation: Not necessary under conditions of normal use.
Protective gloves: Not necessary under conditions of normal use.
Eye protection: Not necessary under conditions of normal use.
Other protective clothing or equipment: Not necessary under conditions of normal use.
Section 9 - Physical and Chemical Properties

9.1 Basic physical and chemical properties

- **Physical state:** Solid
- **Colour:** according to product specifications
- **Odour:** Not applicable
- **Melting point / Freezing point:** Not applicable
- **Boiling point/Boiling range:** Not applicable
- **Flammability:** Not determined
- **Lower and upper explosion limits / Flammability limit:** Not determined
- **Flash point:** Not applicable
- **Auto-ignition temperature:** Not applicable
- **Decomposition temperature:** No decomposition under normal conditions of use
- **pH:** Not applicable
- **Kinematic viscosity:** Not applicable
- **Solubility:** Not applicable
- **Partition coefficient (n-octanol/water) log value:** Not applicable
- **Vapour pressure:** Not applicable
- **Density or relative density:** Not applicable
- **Relative vapour density:** Not applicable
- **Particle characteristics:** Not applicable
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Section 10 - Stability and Reactivity

The batteries are contained in a stable container and are sealed to avoid any chemical release under conditions of normal use.

10.1 Reactivity
No reactions if article is used according to specifications.

10.2 Chemical stability
No decomposition if article is used according to specifications.

10.3 Possibility of hazardous reactions
No dangerous reactions if article is used according to specifications.

10.4 Conditions to avoid
See section 7

10.5 Incompatible materials
See section 7

10.6 Hazardous decomposition products
No further information available
Section 11 - Toxicological Information

11.1 Information on toxicological effects
The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see handling and storage in section 7).

Classification based on the hazardous substances contained in the product (electrode materials and electrolyte solution contained in the batteries):

Acute toxicity
Based on classification of ingredients, the classification criteria are not met.

Skin corrosion/irritation
Causes severe skin burns (Disilver Oxide (Ag2O), Potassium hydroxide (KOH))

Serious eye damage/irritation
Causes serious eye damage. (Disilver Oxide (Ag2O))

Respiratory or skin sensitization
Based on classification of ingredients, the classification criteria are not met.

Germ cell mutagenicity
Based on classification of ingredients, the classification criteria are not met.

Carcinogenicity
Based on classification of ingredients, the classification criteria are not met.

Reproductive toxicity
Based on classification of ingredients, the classification criteria are not met.

STOT-single exposure
Based on classification of ingredients, the classification criteria are not met.

STOT-repeated exposure
May cause damage to organs (Brain) through prolonged or repeated exposure (Inhalation) (Manganese Dioxide)

Aspiration hazard
Based on classification of ingredients, the classification criteria are not met.

11.2 Information on the likely routes of exposure
The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (exposure via ingestion, skin or eye contact or inhalation). The most likely risk is acute exposure when a cell vents.

11.3 Symptoms related to the physical, chemical and toxicological characteristics
No further information available.

11.4 Delayed and immediate effects and also chronic effects from short and long term exposure
The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Risk of exposure occurs only if the battery is mechanically or electrically abused or if it is ingested (see handling and storage in Section 7). No adverse effects expected in case of swallowing an intact silver battery (small diameter and low voltage). Swallowing a damaged battery leads to chemical burns, perforation of soft tissues. Severe burns can occur within 2 hours of ingestion. In case of ingestion, seek medical attention immediately.
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11.5 Numerical measures of toxicity
No further information available.

11.6 Interactive effects
No further information available.
Section 12 - Ecological Information

The chemicals mentioned in Section 3 are contained in a stable container and are sealed. Under conditions of normal use, the chemicals will not be released.

12.1 Toxicity
Classification based on the hazardous substances contained in the product (electrode materials and electrolyte solution contained in the batteries):
Aquatic toxicity: Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability
Not biodegradable.

12.3 Bioaccumulative potential
No further information available.

12.4 Mobility in soil
No further information available.

12.5 Other adverse effects
No further information available.
Section 13 - Disposal Considerations

13.1 Disposal methods

a) **Be sure to comply with your federal, state and local regulation disposal of used batteries.**

   Please dispose of used batteries or batteries you don’t need any more at an official collection point (if official collection point existing).

   Dispose in accordance with appropriate national and international regulations, below some references.

   **European Community:** according to Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), Annex VII, batteries have to be removed from any separately collected WEEE. The removed batteries have to be treated according to the Battery directive 2006/66/EC

   **US:** Batteries are neither specifically listed nor exempted from the Federal Environmental Protection Agency (US EPA) hazardous waste regulations.

   As electric capacity can be left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or rupture, so make sure to cover the (+) or (-) terminals with electrical or adhesive tape or some other insulator before disposal.

   **Use a professional disposal firm for disposal of mass quantities of undischarged batteries.**

b) Open cells should be treated as hazardous waste
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Section 14 - Transportation Information

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for RENATA silver oxide batteries has been designed to be compliant with these regulatory concerns.

Silver oxide batteries (sometimes referred to as “Dry cell” batteries) are not listed as dangerous goods under the IATA Dangerous Goods Regulations, ICAO Technical Instructions and the U.S. hazardous materials regulations (49 CFR).

These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following special provisions:

<table>
<thead>
<tr>
<th>Method</th>
<th>Technical Guidelines</th>
<th>Packing Instruction and Special Provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine</td>
<td>International Maritime Dangerous Goods (IMDG)</td>
<td>Special Provision A304</td>
</tr>
</tbody>
</table>

All RENATA silver oxide batteries are packed in such a way to prevent short circuits or the generation dangerous quantities of heat and meet the special provisions listed above. In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words “not restricted” and the Special Provision number A123 be provided on the air waybill, when an air waybill is issued.
Environment-related law of batteries: EU nations have applicable law in accordance with Directive 2006/66/EC and other some countries, China, Korea, Brazil, some provinces of USA and Canada or so have similar law.
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Section 16 - Other Information

If you need further information, please contact Renata SA sales representative.

Abbreviations
Acute Tox. 4: Acute toxicity, Hazard Category 4
Aquatic Acute 1: Hazardous to the aquatic environment, Acute Hazard Category 1
Aquatic Chronic 1: Hazardous to the aquatic environment, Chronic Hazard Category 1
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Ox. Sol. 1: Oxidising Solids, Hazard Category 1
Ox. Liq. 1: Oxidising Liquids, Hazard Category 1
Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
STOT RE 2 Specific target organ toxicity — Repeated exposure, Hazard Category 2
H271: May cause fire or explosion; strong oxidiser.
H302: Harmful if swallowed
H314: Causes severe skin burns and eye damage
H318: Causes serious eye damage
H332: Harmful if inhaled
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.
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS: Chemical Abstracts Service (division of the American Chemical Society)
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
IATA: International Air Transport Association
IMDG: International Maritime Code for Dangerous Goods