# Safety Data Sheet

## 1 Identification

### Product identifier

- **Trade name**: Silver Oxide Button Cell (Mercury Free)-Cell

### Item No.


### Recommended use of the chemical and restrictions on use:

- **Application of the substance / the preparation**: Electronic products

### Details of the supplier of the safety data sheet

- **Manufacturer/Supplier**: CHUNG PAK BATTERY WORKS LIMITED
  - CHUNG PAK (GUANG DONG) BATTERY INDUSTRIAL CO., LTD
- **Full address**:
  - 7/F., CHUNG PAK COMMERCIAL BUILDING, 2 CHO YUEN STREET, YAU TONG BAY, KOWLOON, HONGKONG
  - GANCUN SECTION FOCHEN ROAD CHEN CUN COUNTY SHUNDE DISTRICT FOSHAN CITY GUANGDONG PROVINCE CHINA
- **Phone number**: 852-27171338
- **Fax**: 852 2772 7727
- **Email**: dylan.cai@chungpak.com
- **Other US contact point**: No available

### Further information obtainable from

- **CHUNG PAK BATTERY WORKS LIMITED
  - CHUNG PAK (GUANG DONG) BATTERY INDUSTRIAL CO., LTD**

### Emergency telephone number:

- USA Poison Center Tel: +1 800 222 1222
- +86-757-23312338 Dylan

### Remark:

*This sample is likely to be classified as article and is out of scope of a SDS as set out in 29 CFR Part 1910.1200. This SDS is generated for client’s reference only.*

## 2 Hazard(s) identification

### Classification of the substance or mixture

Classification according to OSHA Hazard Communication Standard (29 CFR 1910.1200)

- **GHS08 Health hazard**
  - Carc. 2 H351 Suspected of causing cancer.
  - STOT RE 1 H372 Causes damage to organs through prolonged or repeated exposure.

- **GHS05 Corrosion**
  - Skin Corr. 1A H314 Causes severe skin burns and eye damage.
  - Eye Dam. 1 H318 Causes serious eye damage.

- **GHS07**
  - Acute Tox. 4 H302 Harmful if swallowed.
  - Acute Tox. 4 H332 Harmful if inhaled.
  - Skin Sens. 1 H317 May cause an allergic skin reaction.

### Information concerning particular hazards for human and environment:

The product has to be labeled due to the calculation procedure of OSHA Hazard Communication Standard (29 CFR 1910.1200).

(Contd. on page 2)
3 Composition / information on ingredients

. Chemical characterization: Mixtures
. Description:
Mixture of the substances listed below with nonhazardous additions.
For the wording of listed risk phrases refer to section 16.

. Composition:

<table>
<thead>
<tr>
<th>Substance Code</th>
<th>Substance Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-13-9</td>
<td>manganese dioxide</td>
<td>21-23%</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td>40-45%</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>zinc</td>
<td>10.5-12%</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>potassium hydroxide</td>
<td>4.5-5.2%</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td>0.01-0.05%</td>
</tr>
<tr>
<td>7782-42-5</td>
<td>Graphite</td>
<td>5.3-6%</td>
</tr>
<tr>
<td>25038-54-4</td>
<td>Polyamide (iminocarbonylpentamethylene)</td>
<td>1.5-2%</td>
</tr>
<tr>
<td>20667-12-3</td>
<td>silver oxide</td>
<td>5-12</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
# Safety Data Sheet

## Trade Name: Silver Oxide Button Cell (Mercury Free) - Cell

### Effective Date: 10/08/2015

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-02-0</td>
<td>nickel</td>
<td>1-2%</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Carc 2, H351; STOT RE 1, H372; Skin Sens. 1, H317" /></td>
<td></td>
</tr>
<tr>
<td>9004-34-6</td>
<td>Cellulose</td>
<td>0.5-1%</td>
</tr>
<tr>
<td>1314-13-2</td>
<td>zinc oxide</td>
<td>0.5-1%</td>
</tr>
<tr>
<td>9003-04-7</td>
<td>2-Propenoic acid, homopolymer, sodium salt</td>
<td>0.1-0.3%</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Eye Irrit. 2A, H319" /></td>
<td></td>
</tr>
<tr>
<td>9003-01-4</td>
<td>Polyacrylic acid</td>
<td>0.05-0.1%</td>
</tr>
<tr>
<td>7789-23-3</td>
<td>potassium fluride</td>
<td>0.05-0.1%</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Acute Tox. 3, H301; Acute Tox., H311; Acute Tox. 3, H331" /></td>
<td></td>
</tr>
<tr>
<td>20661-21-6</td>
<td>indium trihydroxide</td>
<td>0.01-0.1%</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335" /></td>
<td></td>
</tr>
<tr>
<td>21645-51-2</td>
<td>aluminium hydroxide</td>
<td>0.05-0.1%</td>
</tr>
</tbody>
</table>

**Remark:**
- zinc (CAS: 7440-66-6)
  Note: Zn
- manganese dioxide (CAS: 1313-13-9)
  Note: MnO₂
- potassium hydroxide (CAS: 1310-58-3)
  Note: KOH
- Graphite (CAS: 7782-42-5)
  Note: Carbon(C)
- iron (CAS: 7439-89-6)
  Note: Fe
- Poly(iminocarbonylpentamethylene) (CAS: 25038-54-4)
  Note: Polyamide 6
- 2-Propenoic acid, homopolymer, sodium salt (CAS: 9003-04-7)
  Note: 12. Sodium Polyacrylic Acid

## First-aid measures

### Description of first aid measures

**General description:**
Immediately remove any clothing soiled by the product. Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

**After inhalation:**
In case of unconsciousness place patient stably in side position for transportation. Get medical aid immediately. Remove from exposure and move to fresh air immediately. Use oxygen if available. Use oxygen device such as mask or bag.

**After skin contact:**
Get medical aid at once. Immediately remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Discard contaminated clothing in a manner which limits further exposure.

**After eye contact:**
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**After swallowing:**
Drink copious amounts of water and provide fresh air. Immediately call a doctor. Do not induce vomiting; immediately call for medical help.

**Most important symptoms and effects, both acute and delayed:**
No further relevant information available.

**Indication of any immediate medical attention and special treatment needed**
No further relevant information available.
5 Fire-fighting measures

- **Suitable extinguishing agents:**
  - CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture:** No further relevant information available.
- **Special protective equipment and precautions for firefighters**
  - **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures:**
  - Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**
  - Do not allow product to reach sewage system or any water course.
  - Inform respective authorities in case of seepage into water course or sewage system.
  - Do not allow to enter sewers/surface or ground water.
- **Methods and material for containment and cleaning up:**
  - Use neutralizing agent.
  - Dispose contaminated material as waste according to item 13.
  - Ensure adequate ventilation.

7 Handling and storage

- **Precautions for safe handling:**
  - Thorough dedusting.
  - Ensure good ventilation/exhaustion at the workplace.
  - For the general occupational hygienic measures refer to Section 8.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.

8 Exposure controls / personal protection

- **Components with limit values that require monitoring at the workplace:**

<table>
<thead>
<tr>
<th>Compound</th>
<th>PEL (USA)</th>
<th>REL (USA)</th>
<th>TLV (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-13-9 manganese dioxide</td>
<td>Ceiling limit value: 5mg/m³ as Mn</td>
<td>Short-term: 3mg/m³</td>
<td>Long-term: 1mg/m³ as Mn</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1310-58-3 potassium hydroxide</td>
<td>Ceiling limit value: 2mg/m³</td>
<td>Ceiling limit value: 2mg/m³</td>
<td></td>
</tr>
<tr>
<td>7782-42-5 Graphite (5.3-6%)</td>
<td>Long-term value: 15mppcf*mg/m³</td>
<td>Long-term value:2.5*mg/m³</td>
<td>Long-term value:2*mg/m³</td>
</tr>
<tr>
<td></td>
<td>*impinge samples counted by light field techn.</td>
<td>*respirable dust</td>
<td>all forms except graphite fibers; *resp. fraction</td>
</tr>
<tr>
<td>7440-02-0 nickel(1-2%)</td>
<td>Long-term value:1mg/m³</td>
<td>Long-term value: 0.015mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

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29 CFR 1910.1200
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Trade Name: Silver Oxide Button Cell (Mercury Free)

### TLV (US)
- **Long-term value:** 1.5*mg/m$^3$
  - elemental, *inhalable fraction

### 9004-34-6 Cellulose (0.5-1%)
- **PEL (USA)**
  - Long-term value: 15*5**mg/m$^3$
  - *total dust **respirable fraction
- **REL (USA)**
  - Long-term value: 10*5**mg/m$^3$
  - *total dust **respirable fraction
- **TLV (USA)**
  - Long-term value: 10mg/m$^3$

### 1314-13-2 Zinc Oxide (0.5-1%)
- **PEL (USA)**
  - Long-term value: 15*5**mg/m$^3$
  - *total dust **respirable fraction and fume
- **REL (USA)**
  - Short-term value: 10*5**mg/m$^3$
  - Long-term value: 5*5**mg/m$^3$
  - Ceiling limit value: 15*mg/m$^3$
  - *dust only **fume
- **TLV (USA)**
  - Short-term value: 10*mg/m$^3$
  - Long-term value: 2*mg/m$^3$
  - *as respirable fraction

### 7789-23-3 Potassium Fluoride (0.05-0.1%)
- **PEL (USA)**
  - Long-term value: 2.5mg/m$^3$
  - as F
- **REL (USA)**
  - Long-term value: 2.5mg/m$^3$
  - as F
- **TLV (USA)**
  - Long-term value: 2.5mg/m$^3$
  - as F, *BEI

### 21645-51-2 Aluminium Hydroxide (0.05-0.1%)
- **REL (USA)**
  - Long-term value: 2mg/m$^3$
  - as Al
- **TLV (USA)**
  - Long-term value: 1*mg/m$^3$
  - as Al; *as respirable fraction

### 7440-50-8 Copper (0.01-0.05%)
- **PEL (USA)**
  - Long-term value: 1*0.1**mg/m$^3$
  - as Cu *dusts and mists **fume
- **REL (USA)**
  - Long-term value: 1*0.1**mg/m$^3$
  - as Cu *dusts and mists **fume
- **TLV (USA)**
  - Long-term value: 1*0.2**mg/m$^3$
  - *dusts and mists **fume; as Cu

### Ingredients with biological limit values:

#### 7789-23-3 Potassium Fluoride
- **BEI (US)**
  - 2mg/L
  - Medium: urine
  - Time: prior to shift
  - Parameter: Fluoride (background, nonspecific)
  - 3mg/L
  - Medium: urine
  - Time: end to shift
  - Parameter: Fluoride (background, nonspecific)

#### Additional information:
The lists that were valid during the creation were used as basis.

#### Based on the composition shown in Section 3, the following measures are suggested for occupational safety measure.

#### Appropriate engineering controls:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.

(Contd. on page 6)
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
See Section 7 for information about design of technical facilities.

**Personal protective equipment:**

**Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

**Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

**Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

**Penetration time of glove material:**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

**Eye protection:**

Tightly sealed goggles

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### 9 Physical and chemical properties

**General Information**

**Appearance:**
- **Form:** Solid, button cell
- **Color:** Silvery
- **Odor:** Odorless
- **Odor threshold:** Not available
- **pH-value:** Not applicable. Not available

**Change in condition**
- **Melting point/ Melting range:** Not available
- **Freezing point:** Not available
- **Boiling point/ Boiling range:** Not available

**Flash point:** Not available

**Flammability (solid, gaseous):** Not available

**Auto-Ignition temperature:** Not available

**Decomposition temperature:** Not available

**Explosion limits:**
- **Lower:** Not available
- **Upper:** Not available

**Vapor pressure:** Not available

**Density:** Not available

**Relative density:** Not available
Trade Name: Silver Oxide Button Cell (Mercury Free)-Cell

10 Stability and reactivity

- Reactivity: Data not available
- Chemical stability: Stable under normal operating and storage conditions.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Acute toxicity:
  - LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th></th>
<th>LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310-58-3</td>
<td>273</td>
<td>mg/kg (rat)</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>30000 mg/kg (rat)</td>
<td></td>
</tr>
<tr>
<td>9004-34-6</td>
<td>&gt;5000 mg/kg (rat)</td>
<td></td>
</tr>
<tr>
<td>9003-04-7</td>
<td>&gt;40000 mg/kg (rat)</td>
<td></td>
</tr>
<tr>
<td>7789-23-3</td>
<td>245</td>
<td>mg/kg (rat)</td>
</tr>
</tbody>
</table>

- skin corrosion/irritation: Caustic effect on skin and mucous membranes.
- Serious eye damage/irritation: Strong caustic effect.
- Respiratory or skin sensitization: Sensitizing possible through skin contact.
- Additional toxicological information:
  - The product shows the following dangers according to internally approved calculation methods for preparations:
  - Harmful
  - Corrosive
  - Irritant
  - Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

- Carcinogenic categories

<table>
<thead>
<tr>
<th>IARC (International Agency for Research on Cancer)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25038-54-4 Poly(iminocarbonylpentamethylene)</td>
<td>3</td>
</tr>
<tr>
<td>7440-02-0 nickel</td>
<td>1</td>
</tr>
<tr>
<td>7789-23-3 potassium fluoride</td>
<td>3</td>
</tr>
<tr>
<td>9003-01-4 Polyacrylic acid</td>
<td>3</td>
</tr>
</tbody>
</table>

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Trade Name: Silver Oxide Button Cell (Mercury Free)-Cell

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- NTP (National Toxicology Program)
  7440-02-0 nickel R

- OSHA-Ca (Occupational Safety & Health Administration)
  None of the ingredients is listed.

12 Ecological information
- Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Other adverse effects: No further relevant information available.

13 Disposal considerations
- Waste treatment methods
- Recommendation:
  Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
  Recommendation: Disposal must be made according to official regulations.

14 Transport information
- Silver Oxide Button Cell (Mercury Free) is exempt from dangerous goods. It is considered non-dangerous goods by the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), International Maritime Dangerous Goods regulations (IMDG), the《Recommendations on the Transport of Dangerous Goods Model Regulations》 (17th) and also is not classified as dangerous goods under the 56th Edition of the IATA Dangerous Good Regulation 2015 Special Provision A123.
  Separate batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.
  Transport Fashion: By air, by sea, by road.

15 Regulatory information
- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara
  - Section 335 (extremely hazardous substances):
    None of the ingredients is listed.
  - Section 313 (specific toxic chemical listings):
    1313-13-9 manganese dioxide
    7440-02-0 nickel
    1314-13-2 zinc oxide
    7440-50-8 copper

- TSCA (Toxic Substances Control Act):
  7439-89-6 iron
  1313-13-9 manganese dioxide
  1310-58-3 potassium hydroxide

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Trade Name: Silver Oxide Button Cell (Mercury Free)-Cell

<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7782-42-5</td>
<td>Graphite</td>
</tr>
<tr>
<td>25038-54-4</td>
<td>Poly (iminocarbonylpentamethylene)</td>
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<td>9003-01-4</td>
<td>Polycrylic acid</td>
</tr>
<tr>
<td>21645-51-2</td>
<td>aluminium hydroxide</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
</tr>
</tbody>
</table>

Proposition 65

- **Chemical known to cause cancer:**
  
  7440-02-0 nickel

- **Chemicals known to cause reproductive toxicity for females:**
  None of the ingredients is listed.

- **Chemicals known to cause reproductive toxicity for males:**
  None of the ingredients is listed.

- **Chemicals known to cause developmental toxicity:**
  None of the ingredients is listed.

Cancerogenity categories

- **EPA (Environmental Protection Agency)**
  
<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>Chemical Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-13-9</td>
<td>manganese dioxide</td>
<td>D</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>zinc</td>
<td>II</td>
</tr>
<tr>
<td>1314-13-2</td>
<td>zinc oxide</td>
<td>D, I, II</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td>D</td>
</tr>
</tbody>
</table>

- **TLV (Threshold Limit Value established by ACGIH)**
  
<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>Chemical Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-02-0</td>
<td>nickel</td>
<td>A5</td>
</tr>
<tr>
<td>7789-23-3</td>
<td>potassium fluoride</td>
<td>A4</td>
</tr>
</tbody>
</table>

- **NIOSH-Ca (National Institution for Occupational Safety & Health)**
  
<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>Chemical Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-02-0</td>
<td>nickel</td>
<td></td>
</tr>
</tbody>
</table>

16 Other information

- **Relevant phrases**
  
  H301 Toxic if swallowed.
  H302 Harmful if swallowed.
  H311 Toxic in contact with skin.
  H314 Causes severe skin burns and eye damage.
  H317 May cause an allergic skin reaction.
  H331 Toxic if inhaled.
  H332 Harmful if inhaled.
  H351 Suspected of causing cancer.
  H372 Cause damage to organs through prolonged or repeated exposure.

***************************************************************************

(Contd. on page 8)
The contents and format of this SDS are in accordance with 29 CFR 1910.1200 (g)

DISCLAIMER OF LIABILITY
The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in anyway connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

Remark:
*This sample is likely to be classified as article and is out of scope of a SDS as set out in 29 CFR Part 1910.1200. This SDS is generated for client’s reference only.

. Date of preparation/last revision 2015.08.10/-

. Abbreviations and acronyms:
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Acute Tox. 3: Acute toxicity, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Skin Sen. 1: Sensitisation – skin, Hazard Category 1
Carc. 2: Carcinogenicity, Hazard Category 2
STOT RE 1: Specific target organ toxicity – Repeated exposure, Hazard Category 1

End of document