Products Information Data Sheet

These products are hermetically sealed state in a vessel, and are exempted from Safety Data Sheet regulations. However, this manual provides you with referential information to safety use the products.

Section 1 - Products and Company Identification

Products name: Carbon Zinc Batteries(R)
Products sizes: R20 R14 R6 R03
Company: TOSHIBA LIFESTYLE PRODUCTS & SERVICES CORPORATION
Address: 25-1, Ekimae-honcho, Kawasaki-ku, Kawasaki,
Kanagawa 210-8543, Japan
Telephone: +81-44-331-7299
Fax: +81-44-222-6279

Section 2 - Composition/ Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS#</th>
<th>PRTR</th>
<th>Weight/Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide (MnO₂)</td>
<td>1313-13-9</td>
<td>1-412</td>
<td>45 wt%</td>
</tr>
<tr>
<td>Acetylene black (C)</td>
<td>1333-86-4</td>
<td>Not regulated</td>
<td>10 wt%</td>
</tr>
<tr>
<td>Zinc chloride (ZnCl₂)</td>
<td>7646-85-7</td>
<td>1-1</td>
<td>10 wt%</td>
</tr>
<tr>
<td>Ammonium chloride (NH₄Cl)</td>
<td>12125-02-9</td>
<td>Not regulated</td>
<td>5 wt%</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>7440-66-6</td>
<td>Not regulated</td>
<td>25 wt%</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>7439-92-1</td>
<td>1-304</td>
<td>5 wt%</td>
</tr>
</tbody>
</table>

Section 3 - Summary of Danger and Toxicity

Fatal danger and toxicity: No information available
Danger and toxicity: Chemical ingredient is hermetically sealed in a vessel, so the product is neither dangerous nor toxic as a cell. Zinc chloride which is the contents of cell is an acute toxic. If adhering to skin, skin may cause inflammation.
Effect to environment: Although no information is available as a cell.
Overview of prospective emergency: A cell may break or be shorted by an external mechanical or electrical stress.

Section 4 - First Aid Measures

There is no problem in the normal state. But take the following measures when the contents have begun to leak by the destruction of the battery.

Inhalation: If a person inhaled steam, move to the place where air is fresh immediately. If he/she feels ill, immediately call a doctor for therapy and treatment.
Skin: If the content adheres to skin, immediately wash it with a large amount of clean water and soap promptly. If irritating, consult a doctor.
Eyes: If the content enters eyes, rinse eyes with a large amount of clean water for more than 15 minutes, and consult a doctor.
Ingestion: If a cell is swallowed, immediately call a doctor for therapy and treatment.
Section 5 - Fire Fighting Measures

Fire extinguishers: Powder extinguisher, foam extinguisher, carbon dioxide gas extinguisher, large amount of dry sand

Specific fire fighting method: In the initial state of a fire, move cells/batteries from near the fire source, to a safe location. At that time, work at a windward location, as far as possible, and be sure to put on a protective breathing mask.

Protection of fire fighting personnel: Be wear protective breathing masks, gloves, glasses and helmet for the keeping safe. (Preferably, use a self-feeding type mask.)

Section 6 - Action upon Leakage and Removing Method

A cell hermetically contains constituents in a vessel, so contents normally may not leak out. However, if the contents leaks because of a mechanical or electrical stress, wipe with liquid-boric to absorb it, and collect in a vessel. After that, flush the site with a large amount of water. At that time, be sure to put on protective-gloves, glasses and mask. (Preferably, use a self-feeding type mask.)

Section 7 - Handling and Storage

Handling: Never solder a cell body.

Do not contact cell terminals between each other, or with another conductor. Neither throws into fire, decompose, heat, dent, deform, charge nor drop a battery. Do not dip a cell in water or seawater.

Storage: Store cells without direct sunlight, high temperature, high humidity, rain, dew, etc., and select a storage location with a temperature as low as possible (preferable temperature 10-25°C and relative humidity 70% or less). In addition, keep cells away from dangerous matter such as combustible or ignitable materials. Absolutely never place a cell in contact with a combustible or conductive substance. Prepare appropriate firefighting equipment.

Note: See handling and storing precautions described in the product catalog, specification, etc.

Section 8 - Prevention from Exposure

Protection of respiratory organs: Not required in a normal operating state

Protection of eyes: Not required in a normal operating state

Other protective tools etc.: Not required in a normal operating state

Section 9 - Physical and Chemical Properties

Shape: Cylindrical. Contents are sealed in a stiff stainless steel vessel.

PH: Not applicable because a cell is not soluble with water.

Boiling point/boiling range: No information

Melting point: No information

Decomposition temperature: No information

Flash point: No information
Section 10 - Stability and Reactivity

Conditions to be avoided

- If a number of cells are mixed up without insulating terminals, they may short and possibly heat, break and ignite. When a cell is charged, possibly in bursting the electrolyte etc. Or, it may possibly burst or fire. If a cell is heated or thrown into fire, it may explode or fire with the electrolyte etc. bursting from inside of the cell.
- If decomposed, there is a possibility of overheating or fire due to short circuit, and ignition of some material around etc.

Section 11 - Information on Toxicity

There is no toxicity because chemical substances are hermetically sealed in a metal vessel.

As a reference, chemical substances composing a cell are described below.

- **Manganese dioxide**
  - Acute toxicity: $L_{D0}:45$ mg/kg (Intravenous injection, rabbit)
  - $L_{D0}:422$ mg/kg (Hypodermic injection, mouse)
  - Irritation: Irritating eyes, nose, throat and skin.
  - Chronic toxicity: If a person is exposed to powder for a long time or repeatedly, the lung and the nervous system may be affected, possibly causing bronchitis, pneumonia, nervous disease or mental disease.
  - Procreation toxicity: $TCLO:49mg/m^3$ (Inhalation, mouse)

- **Acetylene black**
  - Acute toxicity: $L_{D50}:2,000mg/kg > $(Rat)
  - Carcinogenic property: IARC group 2 (May be carcinogenic)

- **Zinc chloride**
  - Acute toxicity: $TCLO:4800mg/m^3/30min.$
  - $L_{D50}:350mg/kg$ (oral, rat)

- **Ammonium chloride**
  - Acute toxicity: $L_{D50}:1650mg/kg$ (oral, rat)

- **Zinc**
  - Acute toxicity: $LC_{50}:2500mg/m^3$(Rat inhalation)
  - $TCLO:124mg/m^3/50min.$ (Human, via respiratory tract)

- **Lead**
  - Acute toxicity: $LC_{50}:1000ppm/7hours$(Rat inhalation)

Section 12 - Ecological Information

No information as batteries.

Section 13 - Disposal Precautions

Disposal of the substance should be done according to the laws and regulations.

Although used cells can be discarded basically as "nonflammable refuse," some local governments sort and collect them at their own discretion. Therefore, observe instructions of the government you belong to, to dispose of the substance. Keep the following discarding precautions:

- Even a used cell sometimes stores electric energy. Therefore, to prevent the battery from short-circuit, isolate cells from each other by a method such as taping +, - terminals of cells, or using the individual housing case of a cell, used when you bought the battery, and orderly encasing batteries in a box, then submit an application of disposal to the local government of your residence, using the designated form.
• Packing cells so that they are not shorted, and prevent the package from being wetted.
• If cells must be discarded in a country other than Japan, observe the instructions of the country and local government.

Section 14 - Transportation Precautions
TOSHIBA Carbon Zinc Batteries are considered to be “dry cell” batteries and are not regulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods Regulations (IMDG). Shipping these batteries is subject to the only requirements by DOT is Special Provision 130 i.e. “Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals)”. Shipping these batteries is subject to the only requirements by ICAO and IATA is Special Provision A123 i.e. “An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation.” The International Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under Special Provision 304 which says: "Batteries, dry, containing corrosive electrolyte which will not flow out of the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc carbon, nickel metal hydride and nickel-cadmium batteries.

Section 15 - Applicable Laws and Regulations
The laws and ordinances about the battery obey the latest laws and ordinances.

Section 16 - Other Information
The Carbon Zinc cells/batteries fall in the category of “Article” defined by EPA (U.S. Environment Protection Agency), and chemical substances used in a battery satisfy the application exemption conditions (40.crf.720.3.c) as part of “Article,” so the batteries are not regulated by TSCA.
Safety Data Sheet

The batteries are exempt articles and are not subject to the OSHA Hazard Communication Standard Requirement. This sheet is only provided as technical information and is referred normal use of the product in question. Pairdeer makes no warranty expressed or implied.

Section 1 - Product and Company Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon-Zinc (Super Heavy Duty) Batteries</td>
<td>AA/AAA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Telephone Numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zhongyin (Ningbo) Battery Co., Ltd.</td>
<td>+86 574 87491087 / 87493214</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>Fax Numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>128 Xingguang Road, Hi-Tech Park Ningbo China</td>
<td>+86 574 87493903</td>
</tr>
</tbody>
</table>

Date of preparation
Jan.2, 2019

Section 2 - Hazards Identification

This contains zinc chloride solution (ZnCl₂), and other combustible materials, all sealed in Zinc can. For this reason, improper handling of the battery could lead to distortion, leakage*, overheating, explosion and cause human injury or equipment trouble. Please strictly observe safety instructions.

(*leakage is defined as an unintended escape of liquid from a battery.)

GHS classifications do not apply to our batteries.
Section 3-Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS#</th>
<th>Approximate Content (wt%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese Dioxide (MnO₂)</td>
<td>1313-13-9</td>
<td>27.1</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>7440-66-6</td>
<td>28.5</td>
</tr>
<tr>
<td>Water (H₂O)</td>
<td>7732-18-5</td>
<td>16.9</td>
</tr>
<tr>
<td>Zinc Chloride (ZnCl₂)</td>
<td>7646-85-7</td>
<td>7.2</td>
</tr>
<tr>
<td>Ammonium Chloride (NH₄Cl)</td>
<td>12125-02-9</td>
<td>1.3</td>
</tr>
<tr>
<td>Acetylene Black</td>
<td>1333-86-4</td>
<td>4.9</td>
</tr>
<tr>
<td>Steel</td>
<td>7439-89-6</td>
<td>3</td>
</tr>
<tr>
<td>Carbon</td>
<td>7440-44-0</td>
<td>7.6</td>
</tr>
<tr>
<td>PE</td>
<td>9002-88-4</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Section 4-First Aid Measures

None unless internal materials exposure. If contents are leaked out, observe following instructions:

Inhalation       Fumes can cause respiratory irritation. Remove to fresh air and consult a physician.

Skin             Immediately flush skin with plenty of water. If itch or irritation by chemical burn persists, consult a physician.

Eyes             Immediately flush eye with plenty of water for at least 15 minutes. Consult a physician immediately.

Ingestion        If swallowing a battery, consult a physician immediately.

If contents come into mouth, immediately rinse by plenty of water and consult a physician.

Section 5-Fire Fighting Measures

In case of fire, it is permissible to use any class of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.

Fire fighters should wear self-contained breathing apparatus.
Section 6-Accidental Release Measures
Steps to be taken in case material is released or spilled.
Batteries that are leakage should be handled with rubber gloves.
Avoid direct contact with electrolyte.
Wear protective clothing and a positive pressure Self-Contained Breathing Apparatus (SCBA).

Section 7-Handling and Storage
1) Handling
2) Storage
Never store the battery in hot and high humid place.

Section 8-Exposure Controls, Personal Protection
No engineering measure is necessary during normal use. If internal cell materials are leaked, the information in Section 4 & Section 6 will be useful.

Section 9-Physical/Chemical Characteristics
Nominal Voltage: 1.5V

Section 10-Stability and Reactivity
Stability Stable
Hazardous polymerization Will not occur
Condition to avoid See section 7.
Hazardous Decomposition or Byproducts Hydrogen

Section 11-Toxicological Information
NA

Section 12-Ecological Information
NA
Section 13-Disposal condition
The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

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 Pairdeer Carbon Zinc batteries has been designed to be compliant with these regulatory concerns.

Carbon Zinc batteries (sometimes referred to as “Dry cell” batteries) are not listed as dangerous goods under the ADR European Agreement Concerning the International Carriage of Dangerous Goods by Road, the IMDG International Maritime Dangerous Goods Code, UN Dangerous Good Regulations, 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>Regulatory Body</th>
<th>Special Provisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>Not regulated</td>
</tr>
<tr>
<td>IMDG</td>
<td>Not regulated</td>
</tr>
<tr>
<td>UN</td>
<td>Not regulated</td>
</tr>
<tr>
<td>US DOT</td>
<td>49 CFR 172.102 Provision 130</td>
</tr>
<tr>
<td>IATA</td>
<td>A123</td>
</tr>
<tr>
<td>ICAO</td>
<td>Not regulated</td>
</tr>
</tbody>
</table>

All Pairdeer Carbon Zinc 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 2019 IATA (60th edition) 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.
**Section 15-Regulatory Information**
USA EPA Mercury Containing & Rechargeable Battery Management Act of 1996: No mercury added

**Section 16-Other Information**
If you want further information, please contact Pairdeer sales representative
1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name: E91BP-4, E91BP-4UP, E91BP-8, E91BP-12, E91BP-20W

Other means of identification

Synonyms: None

Recommended use of the chemical and restrictions on use

Recommended Use: Alkaline battery

Uses advised against: No information available

Details of the supplier of the safety data sheet

Supplier Name: Energizer Battery

Supplier Address: 533 Maryville University Drive
St. Louis
MO
63141
US

Supplier Phone Number: Phone:314-985-2000

Supplier Email: travisr.stevener@energizer.com

Emergency telephone number

Company Emergency Phone Number: 314-985-1500

2. HAZARDS IDENTIFICATION

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.
Acute toxicity - Oral | Category 4
Acute toxicity - Inhalation (Gases) | Category 2
Acute toxicity - Inhalation (Vapors) | Category 2
Acute toxicity - Inhalation (Dusts/Mists) | Category 2
Skin corrosion/irritation | Category 1 Sub-category A
Serious eye damage/eye irritation | Category 1
Skin sensitization | Category 1
Carcinogenicity | Category 1A
Reproductive Toxicity | Category 1A
Specific target organ toxicity (single exposure) | Category 3
Specific target organ toxicity (repeated exposure) | Category 1

GHS Label elements, including precautionary statements

Emergency Overview

Signal word | Danger
---|---

**Hazard Statements**
Harmful if swallowed
Fatal if inhaled
Causes severe skin burns and eye damage
May cause an allergic skin reaction
May cause cancer
May cause fertility or the unborn child
May cause respiratory irritation. May cause drowsiness or dizziness

This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture: the above hazards exist.

**Appearance** | **Physical state** | **Odor**
---|---|---
Silver | Solid | None

**Precautionary Statements - Prevention**
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

**Precautionary Statements - Response**
Specific treatment is urgent (see .? on this label)
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see supplemental first aid instructions on this label)

**Eyes**
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing immediately call a POISON CENTER or doctor/physician

**Skin**
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention

**Inhalation**
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell

**Ingestion**
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. Do NOT induce vomiting.

**Precautionary Statements - Storage**
Store locked up. Store in a well-ventilated place. Keep container tightly closed.

**Precautionary Statements - Disposal**
Dispose of contents/container to an approved waste disposal plant.

**Hazards not otherwise classified (HNOC)**
Not applicable

**Unknown Toxicity**
6 % of the mixture consists of ingredient(s) of unknown toxicity

**Other information**
Very toxic to aquatic life with long lasting effects. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons

**Interactions with Other Chemicals**
No information available.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td>1313-13-9</td>
<td>30 - 60</td>
<td>*</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Steel manufacture, chemicals</td>
<td>65997-19-5</td>
<td>10 - 30</td>
<td>*</td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>5 - 10</td>
<td>*</td>
</tr>
<tr>
<td>Graphite</td>
<td>7782-42-5</td>
<td>3 - 7</td>
<td>*</td>
</tr>
</tbody>
</table>

*The exact percentage (concentration) of composition has been withheld as a trade secret

### 4. FIRST AID MEASURES
First aid measures

General Advice
This is a battery. In case of rupture: Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Seek immediate medical attention/advice.

Skin contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek immediate medical attention and advice. May cause an allergic skin reaction.

Inhalation
Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get medical attention immediately if symptoms occur. Do not breathe dust.

Ingestion
Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

Self-protection of the first aider
Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8). Do not breathe dust. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects

Indication of any immediate medical attention and special treatment needed

Notes to Physician
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. May cause sensitization in susceptible persons. Treat symptomatically.
5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical
The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. Product is or contains a sensitizer. May cause sensitization by skin contact.

Explosion Data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Avoid generation of dust. Do not breathe dust.

Other Information
Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so.

Methods for cleaning up
Pick up and transfer to properly labeled containers.
7. HANDLING AND STORAGE

Precautions for safe handling

Handling
In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.

Conditions for safe storage, including any incompatibilities

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

Incompatible Products

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide 1313-13-9</td>
<td>TWA: 0.02 mg/m³ Mn TWA: 0.1 mg/m³ Mn</td>
<td>(vacated) Ceiling: 5 mg/m³ Ceiling: 5 mg/m³ Mn</td>
<td>IDLH: 500 mg/m³ Mn TWA: 1 mg/m³ Mn STEL: 3 mg/m³ Mn</td>
</tr>
<tr>
<td>Zinc 7440-66-6</td>
<td>STEL: 10 mg/m³ respirable fraction TWA: 2 mg/m³ respirable fraction</td>
<td>TWA: 5 mg/m³ fume TWA: 15 mg/m³ total dust TWA: 5 mg/m³ respirable fraction</td>
<td>IDLH: 500 mg/m³ Ceiling: 15 mg/m³ dust and fume STEL: 10 mg/m³ fume</td>
</tr>
<tr>
<td>Steel manufacture, chemicals 65997-19-5</td>
<td>TWA: 0.05 mg/m³ Pb TWA: 0.00005 mg/m³ Be TWA: 0.2 mg/m³ Cu dust and mist TWA: 0.2 mg/m³ Se TWA: 2 mg/m³ Y TWA: 0.02 mg/m³ Mn TWA: 0.1 mg/m³ Mn TWA: 0.5 mg/m³ Hf S*</td>
<td>TWA: 50 µg/m³ Pb TWA: 2 µg/m³ Be TWA: 0.2 mg/m³ Se TWA: 5 mg/m³ Zr Action Level: 30 µg/m³ Pb Poison, See 29 CFR 1910.1025 (vacated) TWA: 2 µg/m³ Be (vacated) TWA: 0.2 mg/m³ Se (vacated) TWA: 5 mg/m³ Zr (vacated) STEL: 25 µg/m³ 30 min (vacated) STEL: 10 mg/m³ Zr (vacated) Ceiling: 5 µg/m³ (vacated) Ceiling: 5 µg/m³ Be Ceiling: 5 mg/m³ Mn</td>
<td>IDLH: 4 mg/m³ Be IDLH: 100 mg/m³ Cu dust and mist IDLH: 500 mg/m³ Mn IDLH: 1 mg/m³ Se IDLH: 500 mg/m³ Y IDLH: 25 mg/m³ Zr IDLH: 100 mg/m³ Pb IDLH: 10 mg/m³ Ni IDLH: 50 mg/m³ Hf Ceiling: 0.05 mg/m³ V dust and fume 15 min Ceiling: 0.0005 mg/m³ Be TWA: 1 mg/m³ Cu dust and mist TWA: 1 mg/m³ Mn TWA: 0.2 mg/m³ except Selenium hexafluoride Se TWA: 1 mg/m³ Y TWA: 5 mg/m³ except Zirconium tetrachloride Zr TWA: 0.050 mg/m³ Pb TWA: 0.015 mg/m³ except Nickel carbonyl Ni TWA: 0.5 mg/m³ Hf STEL: 3 mg/m³ Mn STEL: 10 mg/m³ Zr</td>
</tr>
<tr>
<td>Potassium hydroxide 1310-58-3</td>
<td>Ceiling: 2 mg/m³</td>
<td>(vacated) Ceiling: 2 mg/m³</td>
<td>Ceiling: 2 mg/m³</td>
</tr>
<tr>
<td>Graphite 7782-42-5</td>
<td>TWA: 2 mg/m³ respirable fraction all forms except graphite fibers</td>
<td>TWA: 15 mg/m³ total dust synthetic TWA: 5 mg/m³ respirable fraction synthetic</td>
<td>IDLH: 1250 mg/m³ TWA: 2.5 mg/m³ respirable dust</td>
</tr>
</tbody>
</table>

Page 6 / 14
<table>
<thead>
<tr>
<th><strong>E91BP-4, E91BP-4UP, E91BP-8, E91BP-12, E91BP-20W</strong></th>
<th><strong>Revision Date</strong></th>
<th>13-Apr-2016</th>
</tr>
</thead>
</table>

### Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 982 (11th Cir., 1992)

### Appropriate engineering controls

#### Engineering Measures
- Showers
- Eyewash stations
- Ventilation systems

#### Individual protection measures, such as personal protective equipment

#### Eye/face protection
- Face protection shield.

#### Skin and body protection
- Wear protective gloves and protective clothing. Long sleeved clothing. Chemical resistant apron. Impervious gloves.

#### Respiratory protection
- If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

#### Hygiene Measures
- Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. For environmental protection, remove and wash all contaminated protective equipment before re-use. Do not breathe dust.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>Solid</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Silver</td>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>No information available</td>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Melting / freezing point</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Boiling point / boiling range</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
<tr>
<td><strong>Flammability Limit in Air</strong></td>
<td>No data available</td>
<td>None known</td>
<td></td>
</tr>
</tbody>
</table>

**Upper flammability limit**

No data available
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>None known</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Insoluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>None known</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Softening Point</td>
<td>No data available</td>
</tr>
<tr>
<td>VOC Content (%)</td>
<td>No data available</td>
</tr>
<tr>
<td>Particle Size</td>
<td>No data available</td>
</tr>
<tr>
<td>Particle Size Distribution</td>
<td></td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

**Reactivity**

No data available.

**Chemical stability**

Stable under recommended storage conditions.

**Possibility of Hazardous Reactions**

None under normal processing.

**Conditions to avoid**

Exposure to air or moisture over prolonged periods. Excessive heat.

**Incompatible materials**


**Hazardous Decomposition Products**

None known based on information supplied.

### 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure**

**Product Information**

Product does not present an acute toxicity hazard based on known or supplied information. In case of rupture:

**Inhalation**

Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract. Fatal if inhaled.
Eye contact
Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact
Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns.

Ingestion
Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Harmful if swallowed.

Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td>= 9000 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1313-13-9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>= 284 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1310-58-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization
May cause sensitization in susceptible persons. May cause sensitization by skin contact.

Mutagenic Effects
No information available.

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel manufacture, chemicals</td>
<td>A1</td>
<td>Group 1</td>
<td>Known</td>
<td>X</td>
</tr>
<tr>
<td>65997-19-5</td>
<td>A3</td>
<td>Group 2A</td>
<td>Reasonably Anticipated</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group 2B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproductive toxicity
Contains a known or suspected reproductive toxin.

STOT - single exposure
No information available.

STOT - repeated exposure
Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).

Chronic Toxicity
Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Effects from this product caused by acute exposure may cause permanent damage to target organs and/or may
cause chronic conditions. Contains a known or suspected carcinogen. Contains a known or suspected reproductive toxin. Possible risk of irreversible effects. Avoid repeated exposure. Prolonged exposure may cause chronic effects.

**Target Organ Effects**


**Aspiration Hazard**

No information available.

**Numerical measures of toxicity**

The following values are calculated based on chapter 3.1 of the GHS document

- **ATEmix (oral)**
  - 307.00 mg/kg
- **ATEmix (inhalation-gas)**
  - 435.00 ppm (4 hr)
- **ATEmix (inhalation-dust/mist)**
  - 0.21 mg/l
- **ATEmix (inhalation-vapor)**
  - 2.00 ATEmix
12. ECOLOGICAL INFORMATION

Ecotoxicity
Harmful to aquatic life. Very toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Daphnia Magna (Water Flea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc 7440-66-6</td>
<td>96h EC50: 0.11 - 0.271 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.09 - 0.125 mg/L (Pseudokirchneriella subcapitata)</td>
<td>96h LC50: 3.5 mg/L (Lepomis macrochirus) 96h LC50: 7.8 mg/L (Cyprinus carpio) 96h LC50: 0.24 mg/L (Oncorhynchus mykiss) 96h LC50: 0.59 mg/L (Oncorhynchus mykiss) 96h LC50: 0.211 - 0.269 mg/L (Pimephales promelas) 96h LC50: 2.66 mg/L (Pimephales promelas) 96h LC50: 30 mg/L (Cyprinus carpio) 96h LC50: 0.45 mg/L (Cyprinus carpio) 96h LC50: 2.16 - 3.05 mg/L (Pimephales promelas)</td>
<td></td>
<td>48h EC50: 0.139 - 0.908 mg/L</td>
</tr>
</tbody>
</table>

Potassium hydroxide 1310-58-3 | 96h LC50: 80 mg/L (Gambusia affinis) | |

Persistence and Degradability
No information available.

Bioaccumulation
No information available

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide 1313-13-9</td>
<td>&lt;0</td>
</tr>
<tr>
<td>Potassium hydroxide 1310-58-3</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Other adverse effects
No information available.
13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal methods

This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging

Do not reuse empty containers.

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>California Hazardous Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc 7440-66-6</td>
<td>Ignitable powder Toxic</td>
</tr>
<tr>
<td>Steel manufacture, chemicals</td>
<td>Toxic</td>
</tr>
<tr>
<td>65997-19-5</td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide 1310-58-3</td>
<td>Toxic Corrosive</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>DOT Proper Shipping Name</th>
<th>NOT REGULATED NON REGULATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>N/A</td>
</tr>
<tr>
<td>TDG</td>
<td>Not regulated</td>
</tr>
<tr>
<td>MEX</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ICAO</td>
<td>Not regulated</td>
</tr>
<tr>
<td>IATA Proper Shipping Name</td>
<td>Not regulated NON REGULATED</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>N/A</td>
</tr>
<tr>
<td>IMDG/IMO Hazard Class</td>
<td>Not regulated N/A</td>
</tr>
<tr>
<td>RID</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ADR</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ADN</td>
<td>Not regulated</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

International Inventories
TSCA Complies
DSL All components are listed either on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide - 1313-13-9</td>
<td>1313-13-9</td>
<td>30 - 60</td>
<td>1.0</td>
</tr>
<tr>
<td>Zinc - 7440-66-6</td>
<td>7440-66-6</td>
<td>10 - 30</td>
<td>1.0</td>
</tr>
<tr>
<td>Steel manufacture, chemicals - 65997-19-5</td>
<td>65997-19-5</td>
<td>10 - 30</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

- Acute Health Hazard: No
- Chronic Health Hazard: No
- Fire Hazard: No
- Sudden release of pressure hazard: No
- Reactive Hazard: No

CWA (Clean Water Act)
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Steel manufacture, chemicals</td>
<td>65997-19-5</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>1000 lb</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>1000 lb</td>
<td>RQ 454 kg final RQ</td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>1000 lb</td>
<td>RQ 454 kg final RQ</td>
</tr>
</tbody>
</table>

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
This product does not contain any substances regulated by state right-to-know regulations.
### International Regulations

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Carcinogen Status</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese dioxide</td>
<td>A3 A2</td>
<td>Mexico: TWA= 0.2 mg/m³</td>
</tr>
<tr>
<td>Steel manufacture, chemicals</td>
<td></td>
<td>Mexico: TWA 0.15 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 0.002 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 0.2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: STEL 10 mg/m³</td>
</tr>
<tr>
<td>Graphite</td>
<td></td>
<td>Mexico: TWA= 2 mg/m³</td>
</tr>
</tbody>
</table>

**Canada**

**WHMIS Hazard Class**

Not determined

### 16. OTHER INFORMATION

**NFPA**

- Health Hazards: 1
- Flammability: 0
- Instability: 0

**HMIS**

- Health Hazards: 0
- Flammability: 0
- Physical Hazard: 0
- Personal Protection: X

**Prepared By**

Product Stewardship

23 British American Blvd.

Latham, NY 12110

1-800-572-6501

**Issuing Date**

15-Jun-2015

**Revision Date**

13-Apr-2016

**Revision Note**

No information available

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**