This Article Information Sheet (AIS) provides relevant battery information to retailers, consumers, OEMs and others users requesting a GHS-compliant SDS. Articles, such as batteries, are exempt from GHS SDS classification criteria. The GHS criteria is not designed or intended to be used to classify the physical, health and environmental hazards of an article. Branded consumer batteries are defined as electro-technical devices. The design, safety, manufacture, and qualification of branded consumer batteries follow ANSI and IEC battery standards. This document is based on principles set forth in the following hazard communication approaches: ANSI Z-400.1, GHS, JAMP AIS, and IEC 62474.

1. Document Information

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Duracell Alkaline Batteries (Major and Specialty Cells)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document ID</td>
<td>AIS-ALK</td>
</tr>
<tr>
<td>Issue Date</td>
<td>1-May-15</td>
</tr>
<tr>
<td>Version</td>
<td>1</td>
</tr>
<tr>
<td>Preparer</td>
<td>Global Product Stewardship</td>
</tr>
<tr>
<td>Last Revision</td>
<td>New</td>
</tr>
<tr>
<td>Information Contact</td>
<td><a href="mailto:moquet.l@pg.com">moquet.l@pg.com</a></td>
</tr>
</tbody>
</table>

2. Company Information

| Name & Address                                    | P&G Duracell Global Business Unit, 14 Research Drive, Bethel, CT USA 06801 |
| Telephone                                         | (203) 796- 4430                                                   |
| Website                                           | [www.duracell.com](http://www.duracell.com)                        |
| Consumer Relations                                | North America: 1-800-551-2355 (9:00 AM - 5:00 PM EST)             |

3. Article Information

| Description                                       | Duracell branded consumer alkaline battery                     |
| Product Category                                  | Electro-technical device                                       |
| Use                                               | Portable power source for electronic devices                  |
| Global sub-brands (Retail)                        | Coppertop, Plus, Quantum, Simply, Turbo, Ultra, Basic, TurboMax |
| Global sub-brands (B2B)                          | Procell, Industrial, OEM/OEA                                 |
| Sizes                                             | Major Cells: AA,AAA, C, D & 9V                                |
| Sizes                                             | Specialty Cells: AAAA, MN11, MN21, MN27, MN175, PX76 (LR44), PX28, PX625, (LR09), LR43, LR54, N, J, 4.5V, 625A |
| Sizes                                             | Lanterns: MN903, MN908, MN915, MN918; MN1203                  |
| Principles of Operation                          | A battery powers a device by converting stored chemical energy into electrical energy. |
| Representative Product Images                     | ![Representative Product Images](image1) ![Representative Product Images](image2) ![Representative Product Images](image3) |

4. Article Construction

| Electro-technical System                          | Alkaline Manganese Dioxide                                    |
| Electrode - Negative                              | Zinc (CAS # 7440-66-6)                                        |
| Electrode - Positive                              | Manganese Dioxide (CAS # 1313-13-9)                           |
| Electrolyte                                       | Alkali Metal Hydroxide (aqueous potassium hydroxide - CAS # 1310-58-3) |
| Materials of Construction - Can                   | Nickel Plated Steel                                           |
| Declarable Substances (IEC 62474 Criteria 1)      | None                                                       |
| Mercury Free Battery (ANSI C18.4M <500ppm)       | Yes                                                        |
| Small Cell or Battery (ANSI C18.1M Part 2; IEC 60086-5) | Sizes: AAA and Specialty Cells fit inside a specially designed test cylinder 2.25 inches (57.1mm) long by 1.25 inches (31.70 mm) wide. |

5. Health & Safety
### Article Information Sheet (AIS)

<table>
<thead>
<tr>
<th>Ingestion/Small Parts Warning</th>
<th>Required for Small Cell or Battery [Sizes: AAA and Specialty Cells]: Keep away from children. If swallowed, consult a physician immediately.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Conditions of Use</td>
<td>Exposure to contents inside the sealed battery will not occur unless the battery leaks, is exposed to high temperatures, or is mechanically abused.</td>
</tr>
<tr>
<td>Note to Physician</td>
<td>A damaged battery will release concentrated and caustic potassium hydroxide.</td>
</tr>
<tr>
<td>First Aid - If swallowed</td>
<td>Do not induce vomiting. Seek medical attention immediately. USA CALLS ONLY - CALL 24-HOUR NATIONAL BATTERY INGESTION HOTLINE: (202) 625-3333 - COLLECT.</td>
</tr>
<tr>
<td>First Aid - Eye Contact</td>
<td>Flush with water for at least 15 minutes. Seek medical care if irritation persists.</td>
</tr>
<tr>
<td>First Aid - Skin Contact</td>
<td>Remove contaminated clothing. Wash skin with soap and water. Seek medical care if irritation persists.</td>
</tr>
<tr>
<td>First Aid - Inhalation</td>
<td>Remove to fresh air.</td>
</tr>
</tbody>
</table>
| Battery Safety Standards & Testing                | Duracell batteries meet the requirements of ANSI C18. 1M Part 2 and IEC 60086-5. These standards specify tests and requirements for alkaline batteries to ensure safe operation under normal use and reasonably foreseeable misuse. The test regimes assess three conditions of safety. These are:  
  1-Intended use simulation: Partial use, vibration, thermal shock, and mechanical shock  
  2-Reasonably foreseeable misuse: Incorrect installation, external short-circuit, free fall (user-drop), over-discharge, and crush  
  3-Design consideration: Thermal abuse, mold stress |
| Precautionary Statements                          | CAUTION: Batteries may explode or leak, and cause burn injury, if recharged, disposed of in fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label. Keep small batteries (i.e., AAA) away from children. If swallowed, consult a physician at once. |
| 6. Fire Hazard & Firefighting                     | Batteries may rupture or leak if involved in a fire. |
| Fire Hazard                                       | Use any extinguishing media appropriate for the surrounding area. |
| Extinguishing Media                               | |
| Fires Involving Large Quantities of Batteries     | Large quantities of batteries involved in a fire will rupture and release caustic potassium hydroxide. Firefighters should wear self-contained breathing apparatus and protective clothing. |
| 7. Handling & Storage                             | Avoid mechanical and electrical abuse. Do not short circuit or install incorrectly. Batteries may rupture or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. |
| Handling Precautions                              | Store batteries in a dry place at normal room temperature. Refrigeration does not make them last longer. |
| Storage Precautions                               | |
| Spills of Large Quantities of Loose Batteries (unpacked) | Notify spill personnel of large spills. Irritating and flammable vapors may be released from leaking or ruptured batteries. Spread batteries apart to stop shorting. Eliminate all ignition sources. Evacuate area and allow vapors to dissipate. Clean-up personnel should wear appropriate PPE to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in appropriate container for disposal. Remove any spilled liquid with absorbent material and contain for disposal. |
| 8. Disposal Considerations (GHS Section 13)       | Dispose of used (or excess) batteries in compliance with federal, state/provincial and local regulations. Do not accumulate large quantities of used batteries for disposal as accumulations could cause batteries to short-circuit. Do not incinerate. In countries, such as Canada and the EU, where there are regulations for the collection and recycling of batteries, consumers should dispose of their used batteries into the collection network at municipal depots and retailers. They should not dispose of batteries with household trash. |
## Article Information Sheet (AIS)

### USA EPA RCRA (40 CFR 261)
Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal.

### California Universal Waste Rule (Cal. Code Regs. Title 22, Div. 4.5, Ch. 23)
California prohibits disposal of batteries as trash (including household trash).

### 9. Transport Information (GHS Section 14)

| Regulatory Status | Not regulated. Alkaline batteries (sometimes referred to as “Dry Cell” or “household” batteries) are not listed or regulated as dangerous goods under IATA Dangerous Goods Regulations, ICAO Technical Instructions, IMDG Code, UN Model Regulations, U.S. Hazardous Materials Regulations (49 CFR), and UNECE ADR. |
| Special Provision (SP) Conformance | Special regulatory provisions require batteries to be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits. Shippers can prepare batteries by taping the terminals, individually packaging batteries, or otherwise segregating the batteries to prevent risk of creating a short circuit. Batteries shipped in original unopened Duracell packaging is compliant. |
| UN Identification Number/Shipping Name | None - Not Required |
| US DOT SP | 49 CFR 172.102 Special Provision 130 |
| Air Transport (IATA/ICAO) SP | Special Provision A123 (56th Edition - 2015). NOTE: The words "NOT RESTRICTED" and "SPECIAL PROVISION A123" must be included on the description of the substance on the Air Waybill, when air way-bill is issued. |
| Passenger Air Travel | No restrictions |
| Emergency Transportation Hotline | CHEMREC 24-Hour Emergency Response Hotline
Within the United States call +703-527-3887
Outside the United States, call +1 703-527-3887 (Collect) |

### 10. Regulatory Information (GHS Section 15)

#### 10a. Battery Requirements

| USA EPA Mercury Containing & Rechargeable Battery Management Act of 1996 | During the manufacturing process, no mercury is added. |
| EU Battery Directive 2006/66/EC & amendment 2013/56/EU | Compliant with marking and substance restrictions for mercury (<0.0005%); cadmium (<0.0020%) and lead (<0.0040%). Global labels are marked with the special collection symbol and the EU qualifier in accordance with EU Battery Directive 2006/66/EC, Article 11, Paragraph 1 on batteries and accumulators and waste batteries and accumulators |

#### 10b. General Requirements

| USA CPSIA 2008 (PL. 11900314) | Exempt |
| USA CPSC FHSA (16 CFR 1500) | Consumer batteries are not listed as a hazardous product. |
| USA EPA TSCA Section 13 (40 CFR 707.20) | For customs clearance purpose, batteries are defined as an "Article". |
| USA EPA RCRA (40 CFR 261) | Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal. |
| California Prop 65 | No warning required per 3rd party assessment. |
| CANADA Products Containing Mercury Regulations SOR/20140254 | Mercury free |
| EU REACH SVHC’s (161 Substances) Candidate List December 2014 | No listed substances are present (>0.01% w/w) |
| EU REACH Article 31 | SDS is not required consumer alkaline batteries. |
10c. Regulatory Definitions - Articles

**USA OSHA**
29 CFR 1910.1200(b)(6)(v)

**USA TSCA**
40 CFR 704.3; 710.2(3)(c); and [19 CFR 12.1209a]

**EU REACH**
Title 1 - Chapter 2 - Article 3(3)

**GHS**
Section 1.3.2.1

11. Other Information

11a. Certification & 3rd Party Approvals

**UL (UTGT2.S50939 Single Multiple Station Smoke Alarms - Component)**
AA, 9V
Certification Standard: ANSI/UL 217 Single & Multiple Station Smoke Alarms

11b. AIS Hazard Communication Approaches (consulted in developing this document):

**Globally Harmonized System (GHS)**
GHS SDS requirements and classification criteria do not apply to articles or products (such as batteries) that have a fixed shape, which are not intended to release a chemical. The article exemption is found in Section 1.3.2.1.1 of the GHS and reads: The GHS applies to pure substances and their dilute solutions and to mixtures. "Articles" as defined by the Hazard Communication Standard (29 CFR 1900.1200) of the OSHA of the USA, or by similar definition, are outside the scope of the system."

**Joint Article Management Promotion Consortium JAMP**
JAMP is a Japanese Industry Association who developed the concept of an Article Information Sheet as a supply chain tool to share and communicate chemical information in articles. The AIS authoring process is based on “declarable” substances to meet global regulatory requirements as well as substances to be reported by GADSL, JIG, etc.

**IEC 62474 Ed. 1.0 B:2012 Material Declaration for Products of and for the Electro-technical Industry**

**IEC 62474 Database - Publicly available online (maintained by TC11: Environmental Standardization for electrical and electronic products and systems.**
The general principle for a substance to be included in the database as a declarable substance is: 1) existing national laws or regulations in an IEC member country that are relevant to Electro-technical products and that prohibit or restrict substances, or that have a labeling, communication, reporting or notification requirement, and 2) applying IEC 62474 criteria results in identification of declarable substance.

2.1 Scope: Applies to preparation of SDSs for hazardous chemicals used under occupational conditions. Does not address how the standard may be applied to articles. It presents basic information on how to develop and write a SDS. Additional information is provided to help comply with state and federal environmental and safety laws and regulations. Elements of the standard may be acceptable for International use.

**DISCLAIMER:** This AIS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and are accurate to the best of the Company’s knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations. This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumes no responsibility for injury to the recipient or third persons or for any damage to any property resulting from misuse of the product.
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 damage fertility or the unborn child
May cause respiratory irritation. May cause drowsiness or dizziness

Appearance: Silver
Physical state: Solid
Odor: 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


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</td>
<td>TWA: 0.02 mg/m³ Mn</td>
<td>(vacated) Ceiling: 5 mg/m³ Mn</td>
<td>IDLH: 500 mg/m³ Mn</td>
</tr>
<tr>
<td>1313-13-9</td>
<td>TWA: 0.1 mg/m³ Mn</td>
<td>Ceiling: 5 mg/m³ Mn</td>
<td>TWA: 1 mg/m³ Mn</td>
</tr>
<tr>
<td>Zinc</td>
<td>STEL: 10 mg/m³ Zr</td>
<td>TWA: 5 mg/m³ fume</td>
<td>IDLH: 500 mg/m³ Zr</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>STEL: 10 mg/m³ Zr Respirable</td>
<td>TWA: 15 mg/m³ total dust</td>
<td>Ceiling: 15 mg/m³ dust and fume</td>
</tr>
<tr>
<td></td>
<td>fraction</td>
<td>TWA: 5 mg/m³ respirable fraction</td>
<td>STEL: 10 mg/m³ fume</td>
</tr>
<tr>
<td>Steel manufacture, chemicals</td>
<td>STEL: 10 mg/m³ Zr</td>
<td>TWA: 50 µg/m³ Pb TWA: 2 µg/m³ Be</td>
<td>IDLH: 4 mg/m³ Be</td>
</tr>
<tr>
<td>65997-19-5</td>
<td>STEL: 0.05 mg/m³ Pb TWA: 0.0005</td>
<td>TWA: 0.2 mg/m³ Se TWA: 5 mg/m³ Zr</td>
<td>IDLH: 500 mg/m³ Cu dust and mist</td>
</tr>
<tr>
<td></td>
<td>mg/m³ Be inhalable fraction TWA: 1 mg/m³ Cu dust and mist TWA: 0.2 mg/m³ Se TWA: 1 mg/m³ Y TWA: 0.02 mg/m³ Mn TWA: 0.1 mg/m³ Mn TWA: 0.5 mg/m³ Hf S²</td>
<td>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: 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 Action Level: 30 µg/m³ Pb Poison, See 29 CFR 1910.1025</td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>Ceiling: 2 mg/m³</td>
<td>(vacated) Ceiling: 2 mg/m³</td>
<td>IDLH: 1250 mg/m³</td>
</tr>
<tr>
<td>1310-58-3</td>
<td></td>
<td></td>
<td>TWA: 2.5 mg/m³ respirable dust</td>
</tr>
<tr>
<td>Graphite</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></td>
</tr>
</tbody>
</table>
ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits Immediately Dangerous to Life or Health

Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (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>Physical state</td>
<td>Solid</td>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>Appearance</td>
<td>Silver</td>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>Color</td>
<td>No information available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Melting / freezing point</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>No data available</td>
<td></td>
<td>None known</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
<td></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 1313-13-9</td>
<td>= 9000 mg/kg (Rat)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Potassium hydroxide 1310-58-3</td>
<td>= 284 mg/kg (Rat)</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</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: 0.41 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>48h EC50: 0.139 - 0.908 mg/L</td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>96h LC50: 80 mg/L (Gambusia affinis)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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</td>
<td>&lt;0</td>
</tr>
<tr>
<td>Potassium hydroxide</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</td>
<td>Ignitable powder Toxic</td>
</tr>
<tr>
<td>7440-66-6</td>
<td></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</td>
<td>Toxic</td>
</tr>
<tr>
<td>1310-58-3</td>
<td>Corrosive</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
Proper Shipping Name: NOT REGULATED
Hazard Class: N/A

TDG
Not regulated

MEX
Not regulated

ICAO
Not regulated

IATA
Proper Shipping Name: NOT REGULATED
Hazard Class: N/A

IMDG/IMO
Hazard Class: N/A

RID
Not regulated

ADR
Not regulated

ADN
Not regulated

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 - 7440-66-6</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel manufacture, chemicals - 65997-19-5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium hydroxide - 1310-58-3</td>
<td>1000 lb</td>
<td></td>
<td></td>
<td>X</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 - 7440-66-6</td>
<td>1000 lb</td>
<td></td>
<td>RQ 454 kg final RQ</td>
</tr>
<tr>
<td>Potassium hydroxide - 1310-58-3</td>
<td>1000 lb</td>
<td></td>
<td>RQ 1000 lb 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.
Zinc 7440-66-6 X X X X
Potassium hydroxide 1310-58-3 X X X X
Manganese dioxide 1313-13-9 X X X
Graphite 7782-42-5 X X X

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

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