1. Company and Product Identification

1.1 Identification – Product Name: RoClean P111
1.2 Other means of identification
1.3 Synonym:
1.4 Recommended Use Of The Chemical
Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:
1.5 Competent Person email address
24 Hour Emergency No.: klindsey@avistatech.com
1-800-424-9300 (United States)
1-703 527-3887 (International Collect)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is an odorless, white to cream colored solid. This product is a moderate oxidizer. This product can irritate contaminated skin, eyes, mucous membranes, and any other exposed tissues. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g., carbon oxides, phosphorus oxides, and sodium oxides). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.

Physical Hazards Summary
This product is a moderate oxidizer and skin or eye irritant

Potential Health Hazards Summary
Skin Corrosion/Irritation - Category 2
Serious Eye Damage
Eye Irritation - Category 2A
Oxidizing solid, Category 3
Acute toxicity oral, Category 3

Potential Ecological Effects Summary
Acute Hazards to the aquatic environment – Category 3

2.1 Classification Of Product

U.S. OSHA classification
Corrosive, oxidizer, skin/eye irritant

Classification as per EC 1272/2008
Skin Corrosion/Irritation - Category 2
Serious Eye Damage
Eye Irritation - Category 2A
Oxidizing solid, Category 3
Acute toxicity oral, Category 3
Xi Irritant
E, Corrosive

WHMIS classification
C - Oxidizing Materials
D2B - Poisonous and infectious material - Other effects – Toxic

Hazardous Materials Information System (HMIS) Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>D</td>
</tr>
</tbody>
</table>

2.2 Label Elements OSHA/GHS

General Warnings
- P101 If medical advice is needed, have product container or label at hand.
- P102 Keep out of reach of children.
- P103 Read label before use
- P403 Store in a well-ventilated place.
- P233 Keep container tightly closed

Signal Word WARNING

Hazard statements
- H 272 May cause fire or explosion; oxidizer
- H 312 Harmful in contact with skin
- H315 + H320 Causes skin or eye irritation
- H319 Causes serious eye irritation
- H314-H335 Causes severe skin burns and eye damage. May cause respiratory irritation
- H318 Causes serious eye damage
- H335 May cause respiratory irritation
- H402 Harmful to aquatic life

Precautionary statements
- P305 IF IN EYES, RINSE THOROUGHLY WITH RUNNING WATER
- P338 Remove contact lenses if present and easy to do. Continue rinsing.
- P261 Avoid breathing dust
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P271 Use only outdoors or in a well-ventilated area.
- P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P337 + P313 If eye irritation persists: Get medical advice/attention.
- P404 Store in a closed container.
- P273 Avoid release to the environment.

Hazard pictograms - GHS

Hazard pictograms - WHMIS

2.3 Unclassified Hazards
None

2.4 Ingredients with unknown acute toxicity
None
### 3. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>% w/w</th>
<th>US OSHA</th>
<th>GHS/EU CLP</th>
<th>WHMIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyphosphate Proprietary</td>
<td>25 - 30</td>
<td>Corrosive</td>
<td>Acute Hazards to the aquatic environment - Category 3 Specific Target Organ Toxicity Single Exposure - Category 3 Skin Corrosion/Irritation - Category 1B Serious Eye Damage Eye Irritation - Category 1</td>
<td>E, Corrosive</td>
</tr>
<tr>
<td>Oxygenated inorganic salt Proprietary</td>
<td>25 - 30</td>
<td>Oxidizer, Irritant</td>
<td>Acute Tox. 4 H302 Harmful if swallowed. Skin Irrit. 2 H319 Causes skin irritation. Eye Irrit. 2 H315 Causes serious eye irritation. Oxidizing solid Category 2 H272 May intensify fire; oxidiser. CLP: R22: Harmful if swallowed. R36/38: Irritating to eyes and skin. R8: Contact with combustible material may cause fire.</td>
<td>C: Oxidizer D2B - Poisonous and infectious material - Other effects – Toxic</td>
</tr>
<tr>
<td>Chelate Proprietary</td>
<td>25 - 30</td>
<td>Irritant</td>
<td>Eye Irritant, Category 2A H319 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</td>
<td>Class D2B: Toxic Material at &gt; 1%</td>
</tr>
<tr>
<td>Carbonate salt Proprietary</td>
<td>20 - 25</td>
<td>Irritant</td>
<td>GHS: Eye Irritant Cat 2 CLP: Xi - irritant</td>
<td>D2B - Poisonous and infectious material - Other effects – Toxic</td>
</tr>
<tr>
<td>Surfactant Proprietary</td>
<td>1 - 5</td>
<td>Corrosive, Combustible liquid</td>
<td>Skin sensitizer, Category 1 Acute toxicity, oral, Category 3 H317 May cause an allergic skin reaction Acute toxicity, oral, Category 3 H312 Harmful in contact with skin H332 Harmful if inhaled H314 Causes severe skin burns and eye damage P280 Wear protective gloves/protective clothing/eye protection/face protection. P305 IF IN EYES: rinse extensively with large amounts of water P351 Rinse cautiously with water for several minutes. P338 Remove contact lenses, if present and easy to do. Continue rinsing. P310 IF INGESTED or INHALED Immediately call a POISON CENTER or doctor/physician.</td>
<td>B3 Combustible E Corrosive</td>
</tr>
</tbody>
</table>

### PRODUCT CLASSIFICATION

| Corrosive, oxidizer, skin/eye irritant | Skin Corrosion/Irritation - Category 2 Serious Eye Damage Eye Irritation - Category 2A Oxidizing solid, Category 3 Acute toxicity oral, Category 3 Acute Hazards to the aquatic Environment, Category 3 | E, Corrosive C - Oxidizing Materials D2B - Poisonous and infectious material - Other effects – Toxic |

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
4. FIRST-AID MEASURES

4.1 Description of Necessary Measures

Skin exposure: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

Eye exposure: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

Inhalation: If dusts of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

4.2 Most Important Symptoms/Effects:

Immediate: Inhalation exposure may cause coughing or sneezing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.

Delayed: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.

4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary:

TARGET ORGANS: Acute: Skin, eyes. Chronic: Skin.

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

5. FIRE-FIGHTING MEASURES

Flammable properties Non-flammable oxidizing solid

Flash Point °C: Not applicable.

Autoignition Temperature °C: Not applicable.

Flammable Limits (in air by volume, %):
Upper: Not applicable.
Lower: Not applicable.

5.1 Suitable And Unsuitable Extinguishing Media: This material will contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water spray YES Carbon dioxide YES
5.2 Specific Hazards Arising From Chemical:

When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, phosphorous oxides, and nitrogen oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.

Explosion Sensitivity to Static Discharge: Not applicable.

5.3 Special Protective Equipment And Precautions For Fire-Fighters:

Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions

Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Be aware that mixing with acid could release chlorine or chlorine compounds.

Protective equipment

For small releases (< 20 kg), clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incidental releases (more than 20 kg) should be Level C: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and full-face respirator with HEPA filter.

Emergency procedures

Monitoring must indicate that exposure levels are below those provided in Section 8 (Exposure Controls-Personal Protection) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus.

6.2 Methods and Materials for Containment and Cleaning Up

KEEP AWAY FROM ORGANIC READMELY COMBUSTIBLE MATERIALS. Moisten to suppress dust. Shovel up solids into plastic container for recovery/disposal. Neutralize residue with sodium bicarbonate or other neutralizing agent for weak caustics. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable plastic container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).

7. HANDLING and STORAGE

7.1 Precautions for Safe Handling

All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care.

As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating dust of this product. Remove contaminated clothing immediately.

During equipment maintenance follow practices indicated in Section 6 (Accidental Release Measures) to decontaminate equipment or clean-up small spills. Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate local standards.

7.2 Conditions For Safe Storage

Store at temperatures less than 45°C (113°F). Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials. Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Keep container tightly closed when not in use. Store in original vented shipping container. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

Incompatibilities

Strong acids, oxidizers, caustics. It may react with metals to generate pressure.
8. EXPOSURE CONTROLS - PERSONAL PROTECTION

8.1 Control Parameters

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>% w/w</th>
<th>EXPOSURE LIMITS IN AIR</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACGIH-TLVs</td>
<td>OSHA-PELs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA mg/m³</td>
<td>STEL mg/m³</td>
</tr>
<tr>
<td>Polyphosphate</td>
<td>Proprietary</td>
<td>25 - 30</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Oxygenated inorganic salt</td>
<td>Proprietary</td>
<td>25 - 30</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Chelate</td>
<td>Proprietary</td>
<td>25 - 30</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Carbonate salt</td>
<td>Proprietary</td>
<td>20 - 25</td>
<td>10 (inhalable fraction); 3 (respirable fraction)</td>
<td>NE</td>
</tr>
<tr>
<td>Surfactant</td>
<td>Proprietary</td>
<td>1 - 5</td>
<td>NE</td>
<td>NE</td>
</tr>
</tbody>
</table>

Water and other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers and mutagens).

8.2 Appropriate Engineering Controls.

Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in this Section or as low as reasonably achievable. Ensure eyewash/safety shower stations are available near areas where this product is used.

8.3 Personal Protective Equipment

Respiratory protection: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists or vapor. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the applicable local standards. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full-face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134).

Eye protection: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.

Hand protection: Wear chemical impervious gloves (e.g., Solvex™, Neoprene).

Body protection: If needed, use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance: This product is an odorless, white to cream colored solid.

Odor: None

Melting Point °C (°F): NE

Initial Boiling Point °C (°F): NE

Flammability: Non-flammable

Vapor Density (air = 1): N/A

Solubility (in water): Soluble

Viscosity: Flowing solid

Decomposition Temperature: NE

How To Detect This Substance (Warning Properties): Litmus paper will turn blue when in contact with solutions of this product. Starch-iodide paper will turn dark.

This product has been tested and shown NOT TO BE an oxidizer per the U.S. DOT specifications. It does exhibit moderate oxidizer properties and must be handled as such.
10. STABILITY and REACTIVITY

10.1 Reactivity
Not considered reactive. Moderate oxidizer

10.2 Chemical Stability
Stable

10.3 Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4 Conditions to avoid
Avoid mixing with incompatible materials.

10.5 Incompatible Materials
Strong acids, oxidizers, caustics. It may react with metals to generate pressure.

10.6 Hazardous Decomposition Products
Thermal decomposition of this product may generate carbon monoxide, carbon dioxide, phosphorous oxides and nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Toxicity for hazardous ingredients</th>
<th>Oral LD₅₀ mg/kg</th>
<th>Dermal LD₅₀ mg/kg</th>
<th>Inhalation LD₅₀ mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyphosphate</td>
<td>LD₅₀ (oral, rat) &gt; 7400 mg/kg</td>
<td>LDLo (Intravenous-Rabbit, adult) 1580 mg/kg</td>
<td>LDLo (skin, rabbit) &gt; 300 mg/kg</td>
</tr>
<tr>
<td>Sex Chromosome Loss and Nondisjunction (Oral-Drosophila melanogaster) 11 pph</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Standard Draize Test (Skin-rabbit) &gt; 300 mg/kg</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygenated inorganic salt</td>
<td>&gt; 1034</td>
<td>&gt; 2000</td>
<td>N/A</td>
</tr>
<tr>
<td>Chelate</td>
<td>LD₅₀ (Intraperitoneal-Rat) 1548 mg/kg: Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or function of salivary glands</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects</td>
<td>Standard Draize Test (Eye -Rabbit, adult) 1900 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Draize Test (Eye-Rabbit, adult) 100 mg/24 hours: Moderate irritation effects</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbonate salt</td>
<td>4090</td>
<td>N/A</td>
<td>2300</td>
</tr>
<tr>
<td>Surfactant</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1 Ecotoxicity

<table>
<thead>
<tr>
<th>LC₅₀s mg/L</th>
<th>EC₅₀s mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoClean P111</td>
<td>342 P. promelas Fathead minnow</td>
</tr>
<tr>
<td>41 C. dubia Water flea</td>
<td></td>
</tr>
<tr>
<td>250, NOEL, 96 hrs P. promelas Fathead minnow</td>
<td></td>
</tr>
<tr>
<td>31 NOEL,48 hrs, C. dubia Water flea</td>
<td></td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative Potential
The components of this product are not expected to bioaccumulate. Significant releases could have an adverse impact on the pH of an aquatic system.

12.4 Mobility in Soil
When spilled onto soil, this product will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity.

12.5 Other Adverse Ecological Effects
This product may be harmful to aquatic life if large quantities of it are released into an aquatic environment.
13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal

Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with local regulations. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.

Disposal of Contaminated Packaging

Cleaned containers can be recycled or disposed of as non-contaminated waste, if authorized by your local authorities. Dispose of containers as required by local regulations.

U.S. EPA Waste Number

Not applicable.

14. TRANSPORT INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1 UN Number

UN3262

14.2 UN Proper Shipping Name

Corrosive solid, basic, inorganic, n.o.s. (Soda ash, Sodium percarbonate)

14.3 Transport Hazard Class(es)

8 (Corrosive)

Transport label(s) required

Corrosive Class 8

14.4 Packing Group

II

14.5 Marine Pollutant

Not applicable

NA Emergency Response Guide Number (2012)

154

14.6 Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)

Not applicable

14.7 Special Transport Precautions

Not applicable

National Motor Freight Classification

#70

14.8 International Air Transport Association

UN3262

Corrosive solid, basic, inorganic, n.o.s. (Soda ash, Sodium percarbonate)

Transport Hazard Class(es)

8 (Corrosive)

Transport label(s) required

Corrosive Class 8

Packing Group

II

Packaging Instructions

822

International Maritime Organization

UN3262

Corrosive solid, basic, inorganic, n.o.s. (Soda ash, Sodium percarbonate)

Transport Hazard Class(es)

8 (Corrosive)

Transport label(s) required

Corrosive Class 8

Packing Group

II

Marine Pollutant

Not applicable

NA Emergency Response Guide Number (2012)

154

Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)

Not applicable
15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS
SPECIFIC FOR THE PRODUCT

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>Polyphosphate</th>
<th>Oxygenated inorganic salt</th>
<th>Chelate</th>
<th>Carbonate salt</th>
<th>Surfactant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US EPA PROGRAMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Air Act Hazardous Air Pollutants</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
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<tr>
<td>Safe Drinking Water Act</td>
<td>NO</td>
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<td>NO</td>
<td>NO</td>
<td>NO</td>
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<tr>
<td>RCRA F, K, P, U or D-lists</td>
<td>NO</td>
<td>D001</td>
<td>NO</td>
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<tr>
<td>SARA 302 RQ</td>
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<td>SARA 302 TPQ</td>
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<td>SARA 313 LISTED</td>
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<td>NO</td>
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<td><strong>SARA CHEMICAL CATEGORIES</strong></td>
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<tr>
<td>SARA 311/312 ACUTE</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
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<tr>
<td>SARA 311/312 CHRONIC</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>SARA 311/312 FIRE</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>SARA 311/312 PRESSURE</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>SARA 311/312 REACTIVITY</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>EPA EXTREMELY HAZARDOUS SUBSTANCE</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><strong>CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)</td>
<td></td>
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<tr>
<td><strong>US OSHA PROGRAMS</strong></td>
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<td></td>
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<tr>
<td>PEL</td>
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<tr>
<td>PSM</td>
<td>NO</td>
<td>NO</td>
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<td><strong>CHEMICAL SECURITY PROGRAMS</strong></td>
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<tr>
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<td><strong>CHEMICAL WEAPONS CONVENTION</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><strong>US DRUG ENFORCEMENT ADMINISTRATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>DEA Controlled Substances</td>
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<td>WHMIS</td>
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16. OTHER INFORMATION

16.1 Original Preparation
January 6, 2009

16.2 Revision History
26 Feb 2011; 25 July 2011; GHS 5 Nov 2013; 2 December 2013
minor correction section 12

16.3 Prepared by
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16.4 Date of Printing
April 22, 2015
A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

### Section 15

- **GHS**: Global Harmonization System
- **OSHA**: U.S. Occupational Safety and Health Administration.
- **CLP**: Classification and Packaging
- **WHMIS**: Workplace Hazardous Materials Information System
- **STOT**: Specific Target Organ Toxicity.

### Section 5

- **PEL** - Maximum Exposure Level, similar to the U.S. PEL.
- **IDLH** - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The DFG - MAK is the Republic of Germany’s Maximum Exposure Level, similar to the U.S. PEL. NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE (Not Established) is made for reference.

### Section 8

- **ACGIH** - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.
- **TLV** - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.
- **PEL** - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register, 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, “Vacated 1989 PEL,” is placed next to the PEL which was vacated by Court Order.
- **IDLH** - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The DFG - MAK is the Republic of Germany’s Maximum Exposure Level, similar to the U.S. PEL. NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE (Not Established) is made for reference.

### Section 11

- **LD50**: Lethal Dose (solids & liquids) which kills 50% of the exposed animals;
- **LC50**: Lethal Concentration (gases) which kills 50% of the exposed animals;
- **ppm**: Concentration expressed in parts of material per million parts of air or water;
- **mg/m³**: Concentration expressed in weight of substance per volume of air;
- **mg/kg**: Quantity of material, by weight, administered to a test subject, based on their body weight in kg.
- **IARC** - the International Agency for Research on Cancer;
- **NTP** - the National Toxicology Program;
- **RTECS** - the Registry of Toxic Effects of Chemical Substances;
- **OSHA** and **CAL/OSHA**.
- **IARC** and **NTP** rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used.
- **TDL0**, the lowest dose to cause a symptom and
- **TCL0**, the lowest concentration to cause a symptom;
- **LD0**, **LD10**, **LD50**, **LD90**, **LDL0**, and **LDL0**, the lowest dose (or concentration) to cause lethal or toxic effects.
- **BEI**, Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

### Section 12

- **LC50**: The lowest concentration in water which kills 50% of the test subjects.
- **EC50**: The Effect Concentration in water at which 50% of the test species if affected.

### Section 14

- **DOT**: U.S. Department of Transportation
- **IATA**: International Air Transport Association
- **IMO**: International Maritime Organization
- **MARPOL**: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978
- **IBC Code**: Merchant Shipping Code

### Section 15

- **RCRA**: U.S. Resource Conservation and Recovery Act
- **SARA**: U.S. Superfund Amendments and Reauthorization Act
- **PSM**: U.S OSHA Process Safety Management
- **CFATS**: U.S. Department of Homeland Security Chemical Facility Anti-terrorism Standard
- **DSL**: Canadian Domestic Substances List
- **NDSL**: Canadian Non-Domestic Substances List
- **REACH**: European Registration, Evaluation, Authorization and Restriction of Chemicals list
- **TSCA**: U.S. Toxic Substances Control Act