## 1. Company and Product Identification

### 1.1 Identification – Product Name:

RoClean P112

### 1.2 Synonym:

RoClean P112

### 1.3 Recommended Use Of The Chemical

- Organic and Inorganic Salts
- Mixture, none

### 1.4 Use Of The Chemical

- Membrane filtration or ultrafiltration process cleaner
- Use only as directed on the label.

### 1.5 Competent Person email address

klindsey@avistatech.com

### 1.6 24 Hour Emergency No.:

- 1-800-424-9300 (United States)
- 1-703 527-3887 (International Collect)

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**DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NSF INTERNATIONAL TO ANSI/NSF 60 AS STANDARD**

DRINKING WATER TREATMENT CHEMICAL FOR USE OFF-LINE IN REVERSE OSMOSIS SYSTEMS

---

## 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is an odorless, white to cream colored solid. 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 skin or eye irritant

### Potential Health Hazards Summary

- Skin Corrosion/Irritation - Category 2
- Serious Eye Damage
- Eye Irritation - Category 2A
- Acute toxicity oral, Category 3
- Acute Hazards to the aquatic environment – Category 3

### Potential Ecological Effects Summary

- Corrosive, skin/eye irritant
- Skin Corrosion/Irritation - Category 2
- Serious Eye Damage
- Eye Irritation - Category 2A
- Acute toxicity oral, Category 3
- Xi Irritant

### 2.1 Classification Of Product

- **U.S. OSHA classification**
  - Corrosive, skin/eye irritant
  - Skin Corrosion/Irritation - Category 2
  - Serious Eye Damage
  - Eye Irritation - Category 2A
  - Acute toxicity oral, Category 3
  - Xi Irritant

- **Classification as per EC 1272/2008 (CLP/GHS)**
  - Corrosive, skin/eye irritant
  - Skin Corrosion/Irritation - Category 2
  - Serious Eye Damage
  - Eye Irritation - Category 2A
  - Acute toxicity oral, Category 3
  - Xi Irritant
WHMIS classification
E, Corrosive
D2B - Poisonous and infectious material - Other effects – Toxic

<table>
<thead>
<tr>
<th>Hazardous Materials Information System (HMIS) Rating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2</td>
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<tr>
<td>Flammability</td>
<td>0</td>
</tr>
<tr>
<td>Physical Hazard</td>
<td>0</td>
</tr>
<tr>
<td>Protective Equipment</td>
<td>C</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
- H312: 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
- 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
![GHS Hazard Pictograms]

Hazard pictograms - WHMIS
![WHMIS Hazard Pictograms]

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>Silicate compound</td>
<td>60-70</td>
<td>Corrosive</td>
<td>Corrosive, Category 1B</td>
<td>Class E Corrosive</td>
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<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td>H314-H335 P261-P280-P305 + P351 + P338-P310</td>
<td></td>
</tr>
<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrate compound</td>
<td>15-20</td>
<td>Corrosive</td>
<td>Irritant, Category 2</td>
<td>Class D2B: Toxic Material at &gt; 1%</td>
</tr>
<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td>H319</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P305 + P351 + P338</td>
<td></td>
</tr>
<tr>
<td>Polyphosphate</td>
<td>10-15</td>
<td>Corrosive</td>
<td>Acute Hazards to the aquatic environment - Category 3</td>
<td>E, Corrosive</td>
</tr>
<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td>Specific Target Organ Toxicity Single Exposure - Category 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Corrosion/Irritation - Category 1B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Serious Eye Damage</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irritation - Category 1</td>
<td></td>
</tr>
<tr>
<td>Surfactant</td>
<td>1-5</td>
<td>Corrosive, liquid</td>
<td>Skin sensitizer, Category 1</td>
<td>B3 Combustible</td>
</tr>
<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td>Acute toxicity, oral, Category 3</td>
<td>E Corrosive</td>
</tr>
<tr>
<td>Proprietary</td>
<td></td>
<td></td>
<td>H317 May cause an allergic skin reaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute toxicity, oral, Category 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H312 Harmful in contact with skin</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>H332 Harmful if inhaled</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>H314 Causes severe skin burns</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>and eye damage</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>P280 Wear protective gloves/protective clothing/eye protection/face protection.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>P305 IF IN EYES: rinse</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>extensively with large amounts of water</td>
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<td></td>
<td></td>
<td></td>
<td>P351 Rinse cautiously with water for several minutes.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>P338 Remove contact lenses, if present and easy to do. Continue rinsing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P310 IF INGESTED or INHALED Immediately call a POISON CENTER or doctor/physician.</td>
<td></td>
</tr>
</tbody>
</table>

**PRODUCT CLASSIFICATION**

- Corrosive, oxidizer, skin/eye irritant
- Skin Corrosion/Irritation - Category 2
- Serious Eye Damage
- Eye Irritation - Category 2A
- Acute toxicity oral, Category 3
- Acute Hazards to the aquatic Environment, Category 3

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.

Patients 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 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:

Use extinguishing material suitable to the surrounding fire.

Water spray YES Carbon dioxide YES
Foam YES Dry chemical 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.

Protective equipment  For small releases (< 20 kg), clean up spilled solid 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  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 solid; 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 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>
</tr>
</thead>
<tbody>
<tr>
<td>Silicate compound</td>
<td>Proprietary</td>
<td>60-70</td>
<td>ACGIH-TLVs TWA mg/m³</td>
</tr>
<tr>
<td>Citrate compound</td>
<td>Proprietary</td>
<td>15-20</td>
<td>NE</td>
</tr>
<tr>
<td>Polyphosphate</td>
<td>Proprietary</td>
<td>10-15</td>
<td>NE</td>
</tr>
<tr>
<td>Surfactant</td>
<td>Proprietary</td>
<td>1-5</td>
<td>NE</td>
</tr>
<tr>
<td>Water and other components</td>
<td>Balance</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Silicate compound Proprietary 60-70 NE NE NE NE NE NE
Citrate compound Proprietary 15-20 NE NE NE NE NE NE
Polyphosphate Proprietary 10-15 NE NE NE NE NE NE
Surfactant Proprietary 1-5 NE NE NE NE NE NE

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:** NE
- **Initial Boiling Point °C:** 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:** Litmus paper will turn blue when in contact with solutions of this product.

(RoClean P112 SDS)
10. STABILITY and REACTIVITY

10.1 Reactivity
Not considered reactive.

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 data for hazardous ingredients</th>
<th>Oral LD_50 mg/kg</th>
<th>Dermal LD_50 mg/kg</th>
<th>Inhalation LD_50 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicate compound</td>
<td>LD_50 (Oral, rat) 1153</td>
<td>N/A</td>
<td>Skin irritation (24 hr) severe</td>
</tr>
<tr>
<td>Citrate compound</td>
<td>LD_50 (Oral-Rat) 3 g/kg</td>
<td>LD_50 (Oral-Mouse) 5040 mg/kg</td>
<td>LD_50 (Intraperitoneal-Rat) 883 mg/kg</td>
</tr>
<tr>
<td>Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects</td>
<td></td>
<td></td>
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<tr>
<td>Standard Draize Test (Eye-Rabbit, adult) 750 mg/24 hours: Severe irritation effects</td>
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<tr>
<td>Polyphosphate</td>
<td>LD_50 (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>
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<td>Sex Chromosome Loss and Nondisjunction (Oral-Drosophila melanogaster) 11 pph</td>
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<td></td>
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<tr>
<td>Standard Draize Test (Skin-rabbit) &gt; 300 mg/kg</td>
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</tr>
<tr>
<td>Surfactant</td>
<td>N/A</td>
<td>N/A</td>
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</tbody>
</table>
12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

<table>
<thead>
<tr>
<th>12.1</th>
<th>Ecotoxicity</th>
<th>LC₅₀, mg/L</th>
<th>EC₅₀, mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silicate compound</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
<td>LC₅₀ (Mosquitofish) = 530 mg/L</td>
<td>NE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC₅₀ (Waterflea) 48 hours = 113 mg/L</td>
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<tr>
<td></td>
<td></td>
<td>LC₅₀ (Scud) 96 hours = 160 mg/L</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>LC₅₀ (Polychaete) 28 days = 210-250 g/L</td>
<td></td>
</tr>
</tbody>
</table>
| | | TLₐₐₜₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐ¢

12.1 Ecotoxicity LC₅₀, mg/L | EC₅₀, mg/L |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Silicate compound</strong></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
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<tr>
<td></td>
<td></td>
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| | | TLₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐ¢

| **Citrate compound** | | |
|-----------------------|-----------------------------|
| Aquatic | Water Solubility = 59.2% (20°C); 84% (100°C) | |
| | Biological Oxygen Demand (BOD): 40%, 5 days; 60%, 10-20 days. | |
| | Food Chain Concentration Potential: Very Low | |
| | Experimental Log P = -1.64 | |
| | Persistence: Can ferment on standing. Biodegrades quite rapidly. It is dangerous to aquatic life in high concentrations. Lowers pH in water but does not dissociate to any great extent. | |
| | LC₅₀ fish/96h : 18-32 g/L | |
| Terrestrial | NE | NE |

| **Polyphosphate** | | |
|-------------------|-----------------------------|
| Aquatic | LC₅₀ 28.5 (Gambusia affinis (Western mosquito fish, adult female)) | NE |
| Terrestrial | NE | NE |

| **Surfactant** | | |
|----------------|-----------------------------|
| Aquatic | NE | NE |
| Terrestrial | NE | NE |

<table>
<thead>
<tr>
<th>12.3 Bioaccumulative Potential</th>
<th>Most components of this product are not expected to bioaccumulate. There is limited information available on the environmental fate and effects of the silicate salt, if released to the environment. This salt has exhibited moderate to high toxicity to aquatic organisms and moderate toxicity to terrestrial organisms. The salt will persist in aquatic and terrestrial systems. Significant releases could have an adverse impact on the pH of an aquatic system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4 Mobility in Soil</td>
<td>When spilled onto soil, this product will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity.</td>
</tr>
<tr>
<td>12.5 Other Adverse Ecological Effects</td>
<td>This product may be harmful to aquatic life if large volumes of it are released into an aquatic environment.</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Preparing Wastes of this Product for Disposal

Disposal of Contaminated Packaging

U.S. EPA Waste Number

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.

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.

This product is not a hazardous waste as shipped. If spilled, the spill residue may exhibit the D002 hazardous waste characteristic.
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. (Sodium metasilicate, sodium triphosphate)
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

International Air Transport Association

14.8 UN Number UN3262
   UN Proper Shipping Name Corrosive solid, basic, inorganic, n.o.s. (Sodium metasilicate, sodium triphosphate)
   Transport Hazard Class(es) 8 (Corrosive)
   Transport label(s) required Corrosive Class 8
   Packing Group II
   Packaging Instructions 822

International Maritime Organization

14.9 UN Number UN3262
   UN Proper Shipping Name Corrosive solid, basic, inorganic, n.o.s. (Sodium metasilicate, sodium triphosphate)
   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>Silicate compound</th>
<th>Citrate compound</th>
<th>Polyphosphate</th>
<th>Surfactant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US EPA PROGRAMS</strong></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>
</tr>
<tr>
<td>Safe Drinking Water Act</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>RCRA F, K, P, U or D-lists</td>
<td>NO</td>
<td>D001</td>
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<td>NO</td>
</tr>
<tr>
<td>SARA 302 RQ</td>
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<td>NO</td>
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<tr>
<td>SARA 302 TPQ</td>
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<td>NO</td>
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<tr>
<td>SARA 313 LISTED</td>
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<td>NO</td>
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<tr>
<td><strong>SARA CHEMICAL CATEGORIES</strong></td>
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<td></td>
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<tr>
<td>SARA 311/312 ACUTE</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>
16. OTHER INFORMATION

16.1 Original Preparation January 5, 2009
16.2 Revision History GHS 11 Dec 2013
16.3 Prepared by ADVANCED CHEMICAL SAFETY, Inc.
16.4 Date of Printing April 22, 2015
### Section 2

**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 3

**CAS #:** Chemical Abstract Service index number  
**EINECS #:** European Chemical Substances Information System index number

### Section 5

**NPPA:** Nation Fire Protection Association  
**Health Hazard:** 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury).  
**Flammability Hazard**

### 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

**LD<sub>50</sub>** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals;  
**LC<sub>50</sub>** - 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/m<sup>3</sup>** - 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.  
**TDL<sub>0</sub>** - the lowest dose to cause a symptom and  
**TCL<sub>0</sub>** - the lowest concentration to cause a symptom;  
**LD<sub>0</sub>, LD<sub>50</sub>, and LD<sub>100</sub>** - or **TC, TC<sub>0</sub>, LC<sub>50</sub>, and LCo** - 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

**LC<sub>50<sub>W</sub></sub>** - The lowest concentration in water which kills 50% of the test subjects.  
**EC<sub>50<sub>W</sub></sub>** - The Effect Concentration in water at which 50% of the test species if affected.

### Section 13

**US EPA Hazardous Waste Codes:** refer to 40 CFR 261.20

### Section 14

**DOT:** US 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:** US Resource Conservation and Recovery Act  
**SARA:** US Superfund Amendments and Reauthorization Act  
**PSM:** US OSHA Process Safety Management  
**CFATS:** US 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:** US Toxic Substances Control Act