RoClean P112
MATERIAL SAFETY DATA SHEET

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):	**RoClean P112**
CHEMICAL NAME/CLASS:	Not Applicable
SYNONYM:	Mixture
PRODUCT USE:	Reverse Osmosis Membrane Treatment
SUPPLIER/MANUFACTURER'S NAME:	**AVISTA TECHNOLOGIES**
ADDRESS:	140 Bosstick Blvd San Marcos, CA 92069
24 HOUR EMERGENCY NO.:	1-800-424-9300 (United States) 1-703-527-3887 (International Collect)
BUSINESS PHONE:	(760) 744-0536
DATE OF PREPARATION:	January 5, 2009, Revised November 22, 2010

2. HAZARD 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.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product, via route of exposure, are as follows:

INHALATION: If large quantities of airborne dusts or particulates of this product are inhaled, difficulty breathing, irritation of the mucus membranes, coughing, nasal congestion, and a sore throat may occur. Prolonged exposures or exposures to high concentrations of this product may damage the tissues of the respiratory system. Severe inhalation overexposures can cause chemical pneumonitis, pulmonary edema, and death. Repeated inhalation of the dusts or particulates may cause respiratory disorders (e.g., bronchitis).

CONTACT WITH SKIN or EYES: Depending on the duration of skin contact, skin overexposures may cause reddening, discomfort, or irritation. Repeated skin overexposures to low concentrations can cause dermatitis (dry, red skin).

CONTACT WITH SKIN or EYES (continued): Eye contact can cause irritation, reddening, or watering.

SKIN ABSORPTION: Skin absorption is not a significant route of exposure for any component of this product.

INGESTION: Ingestion is not anticipated to be a likely route of exposure to this product. If this product is swallowed, it will irritate the mouth, throat, esophagus, and other tissues of the digestive system. Symptoms of such overexposure can include nausea, vomiting, and diarrhea. Ingestion of large volumes of this product may be fatal.

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound.

2. HAZARD IDENTIFICATION (Continued)

HAZARD SYMBOLS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	**2**
Flammability	**0**
Physical Hazard	**0**
Protective Equipment	**C**

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: Industrial Use situations: B; Safety glasses and gloves, body protection

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**.

ACUTE: This product is an irritant. Depending on the duration of contact, overexposures can irritate or burn the eyes, skin, mucous membranes, and any other exposed tissue. Inhalation may cause coughing and difficulty breathing. Eye contact can cause harm

CHRONIC: Repeated skin overexposures to low concentrations can cause dermatitis (dry, red skin). Repeated inhalation of the dusts or particulates may cause respiratory disorders (e.g., bronchitis). Refer to Section 11 (Toxicology Information) for additional information on this product's components.

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

CANADIAN WHMIS SYMBOLS:

E - Corrosive Materials

3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL			OTHER
			TWA mg/m^3	STEL mg/m^3	TWA mg/m^3	STEL mg/m^3	IDLH mg/m^3	mg/m^3
Silicate Compounds	Proprietary	< 75	NE	NE	NE	NE	NE	NE
Citrate Compound	Proprietary	< 20	NE	NE	NE	NE	NE	NE
Polyphosphate	Proprietary	< 20	NE	NE	NE	NE	NE	NE
Surfactant	Proprietary	< 5	NE	NE	NE	NE	NE	NE

NE = Not Established See Section 16 for Definitions of Terms Used

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

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.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Do NOT interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

4. FIRST-AID MEASURES (continued)

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. Do NOT interrupt flushing. Victim must seek medical attention.

INHALATION: If airborne particulates 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.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions or disorders involving the "Target Organs" (see Section 3, "Hazard Identification") may be aggravated by overexposure to dusts or particulates of this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations may prove useful. Consultation with an ophthalmologist is recommended if eye exposure leads to tissue damage.

5. FIRE-FIGHTING MEASURES

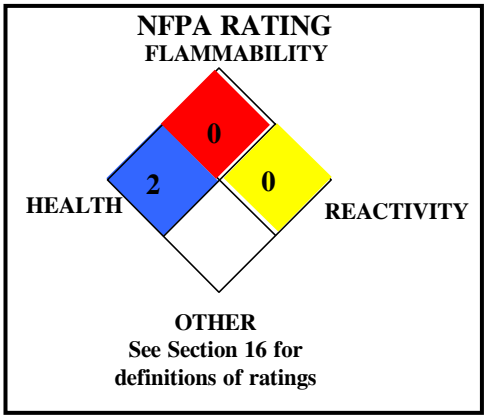
FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower: Not applicable.
Upper: Not applicable.

See Section 16 for Definition of Ratings



FIRE EXTINGUISHING MATERIALS: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water Spray: YES Carbon Dioxide: YES
Foam: YES Dry Chemical: YES
Halon: YES Other: Any "ABC" Class

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is corrosive and presents a severe inhalation and contact hazard to firefighters. When involved in a fire, this product may decompose and produce irritating fumes and toxic gases (e.g., carbon oxides, phosphorus oxides, and sodium oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.
Explosion Sensitivity to Static Discharge: Not applicable.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. 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. Rinse contaminated equipment thoroughly with citric acid solution (or another neutralizer for bases) before returning such equipment to service.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: 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. For small releases, clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incidental releases should be **Level B: triple-gloves (neoprene gloves and nitrile gloves over thin-mil Nitrile gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus.** Monitor the area for dusts of this product's components and the level of oxygen. Monitoring must indicate that exposure levels are below those provided in Section 2 (Composition and Information on Ingredients) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus. Sweep up or vacuum spilled solid. Neutralize residue with citric acid or other neutralizing agent for bases. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residue in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate Canadian standards (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: 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 airborne dusts of this product. Remove contaminated clothing immediately. Wipe down area routinely to avoid the accumulation of dusts of this product.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. If this product is transferred into another container, only use portable containers and tools approved for basic solid. Store containers in a cool, dry location, away from direct sunlight, or sources of intense heat. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of corrosion resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers may contain residual material that is corrosive; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). 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 Canadian standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: None needed under normal conditions of use. Maintain airborne contaminate concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). Use NIOSH approved respirators if ventilation is inadequate to control airborne dusts. 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 Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

EYE PROTECTION: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. A full face-shield should be used when handling more than 10 pounds of this material. Splash goggles with a faceshield may be needed if splash hazards exist.

HAND PROTECTION: Wear chemical impervious gloves (e.g., rubber, Neoprene).

BODY PROTECTION: Use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: C (Safety Glasses, Gloves, Apron)

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Not applicable.
EVAPORATION RATE (water = 1): Not applicable.
SPECIFIC GRAVITY: Not established.
MELTING/FREEZING POINT: Not established.
SOLUBILITY IN WATER: Soluble.
BOILING POINT: Not established.
VAPOR PRESSURE, mm Hg @ 20°C: Not established.
pH: 12-13 (2% aqueous solution)
ODOR THRESHOLD: Odorless
COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not established.
APPEARANCE AND COLOR: This product is an odorless, white solid.
HOW TO DETECT THIS SUBSTANCE (warning properties): Litmus paper will turn blue when in contact with solutions of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate carbon oxides, phosphorus oxides, and sodium oxides.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, oxidizers

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1 % in concentration.

CITRATE COMPOUND:

Skin-Rabbit, adult 500 mg/24H Moderate irritation effects

Eye effects-Rabbit, adult 750 mg/24H Severe irritation effects

Oral-Rat LD50:3 g/kg

Intraperitoneal-Rat LD50:883 mg/kg

Subcutaneous-Rat LD50:5500 mg/kg

Oral-Mouse LD50:5040 mg/kg

Intraperitoneal-Mouse LD50:903 mg/kg

Subcutaneous-Mouse LD50:2700 mg/kg

Intravenous-Mouse LD50:42 mg/kg

Oral-Rabbit, adult LDLo:7000 mg/kg

Intravenous-Rabbit, adult LD50:330 mg/kg

SILICATE COMPOUND:

Skin Irritancy (human) = 250 mg/24 hours; Severe

Skin Irritancy (rabbit) = 250 mg/24 hours; Severe

Skin Irritancy (guinea pig) = 250 mg/24 hours; Moderate

LDLo (oral, dog) = 250 mg/kg; Lungs, Thorax, or Respiration: other changes; Gastrointestinal: other changes; Kidney, Urethra, Bladder: other changes

POLYPHOSPHATE:

TDLo (oral, rat) = 2730 mg/kg/13 weeks/intermittent; Endocrine: changes in spleen weight

LD_{50} (oral, rat) = 3120 mg/kg; Behavioral: somnolence (general depressed activity); coma

SILICATE COMPOUND (continued):

TDLo (oral, rat) = 15 g/kg/male 14 weeks pre-mating/female 14 weeks pre-mating, 3 weeks post-birth; Reproductive: Effects on Newborn: stillbirth, live birth index (measured after birth), weaning or lactation index (e.g., # alive at weaning per # alive at day 4)

TDLo (subcutaneous, rat) = 9766 μg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: testes, epididymis, sperm duct

TDLo (intratesticular, rat) = 9766 μg/kg; male 1 day pre-mating; Reproductive: Paternal Effects: testes, epididymis, sperm duct

LD_{50} (oral, rat) = 1153 mg/kg

LD_{50} (oral, mouse) = 770 mg/kg

LDLo (oral, pig) = 250 mg/kg

LDLo (intraperitoneal, guinea pig) = 200 mg/kg

POLYPHOSPHATE: (continued)

LD_{50} (oral, mouse) = 3100 mg/kg; Peripheral Nerve and Sensation: flaccid paralysis without anesthesia (usually neuromuscular blockage); Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold

LD_{50} (intraperitoneal, rat) = 525 mg/kg; Behavioral: excitement; Nutritional and Gross Metabolic: weight loss or decreased weight gain

POLYPHOSPHATE: (continued):

LD_{50} (subcutaneous, rat) = 2060 mg/kg

LD_{50} (intraperitoneal, mouse) = 700 mg/kg; Kidney, Urethra, Bladder: changes in tubules (including acute renal failure, acute tubular necrosis)

LD_{50} (subcutaneous, mouse) = 900 mg/kg

LD_{50} (intravenous, mouse) = 71 mg/kg

LD_{50} (subcutaneous, guinea pig) = 750 mg/kg

SUSPECTED CANCER AGENT: The components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA, and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product can irritate contaminated tissue.

SENSITIZATION TO THE PRODUCT: The components of this product are not known to be skin or respiratory sensitizers.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: No information is currently available on toxicologically synergistic products of this material

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to produce mutagenic effects in humans.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) determined for the components of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will decompose into other organic and inorganic compounds over time under normal environmental conditions. Additional environmental data are available as follows:

SILICATE COMPOUND:

Solubility: Soluble.

There is limited information available on the environmental fate and effects of this material, if released to the environment. Sodium Metasilicate has exhibited moderate to high toxicity to aquatic organisms and moderate toxicity to terrestrial organisms. Sodium Metasilicate will persist in aquatic and terrestrial systems. Significant releases could have an adverse impact on the pH of an aquatic system.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to animal life if large volumes of it are released into the environment.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment. Additional aquatic toxicity data are available as follows:

SILICATE COMPOUND:

LC_{50} (Mosquitofish) = 530 mg/L

LC_{50} (Waterflea) 48 hours = 113 mg/L

SILICATE COMPOUND: (continued):

LC_{50} (Scud) 96 hours = 160 mg/L

LC_{50} (Polycheate) 28 days = 210-250 μg/L

TLm (Mosquitofish) 96 hours = 2320 ppm (fresh water)

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. 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.

EPA WASTE NUMBER: Not applicable as supplied.

14. TRANSPORTATION INFORMATION

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

PROPER SHIPPING NAME:	Corrosive solid, basic, inorganic, n.o.s. (Sodium metasilicate, sodium triphosphate)
HAZARD CLASS NUMBER and DESCRIPTION:	8 (Corrosive)
UN IDENTIFICATION NUMBER:	UN 3262
DOT LABEL(S) REQUIRED:	CORROSIVE
PACKAGING GROUP:	PG II

NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (2000): 154

NATIONAL MOTOR FREIGHT CLASSIFICATION: LTL: 100; T: 70

MARINE POLLUTANT: No component of this product is listed as a marine pollutant by the D.O.T. (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is considered as dangerous goods, per regulations of Transport Canada. Use above information for Canadian shipments.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: No component of this product is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: All components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: No.
California - Permissible Exposure Limits for Chemical Contaminants: No.
Florida - Substance List: No.
Illinois - Toxic Substance List: No.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: No.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: No.
Missouri - Employer Information/Toxic Substance List: No.
New Jersey - Right to Know Hazardous Substance List: Sodium Percarbonate.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: No.
Rhode Island - Hazardous Substance List: No.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **DANGER!** CAUSES SKIN, EYE, DIGESTIVE TRACT, AND RESPIRATORY TRACT IRRITATION. Do not taste or swallow. Do not get on skin or in eyes. Do not breathe airborne dusts. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, and suitable body protection if necessary. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if any adverse effects occur. IN CASE OF FIRE: Use water fog, dry chemical, CO_2, or "alcohol" foam. IN CASE OF SPILL: Sweep up spill and place in suitable container. Neutralize area with citric acid solution or other material suitable for bases. Consult Material Safety Data Sheet for additional information.

ENVIRONMENTAL HAZARDS: Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

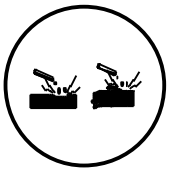
ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: Not applicable.

CANADIAN WHMIS SYMBOLS: **Class E** (Corrosive)



This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

PREPARED BY: ADVANCED CHEMICAL SAFETY, Inc.
7563 Convoy Court
San Diego, CA 92111
(858)-874-5577

DATE OF PRINTING July 24, 2013

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each compound.

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.

OSHA - U.S. Occupational Safety and Health Administration.

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. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL 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 and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - 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^3** 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. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **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. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, 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. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.