



1. Company and Product Identification

1.1	Identification – Product Name:	RoClean P112
1.2	Other means of identification Synonym:	Organic and Inorganic Salts Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use: Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	Membrane filtration or ultrafiltration process cleaner Use only as directed on the label. AVISTA TECHNOLOGIES 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
1.4	Competent Person email address	klindsey@avistatech.com
1.5	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-703 527-3887 (International Collect)



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.

2.1	Classification Of Product	This product is a moderate skin or eye irritant
	U.S. OSHA classification	Corrosive, skin/eye irritant Skin Corrosion/Irritation - Category 2
	Potential Health Hazards Summary	Skin Corrosion/Irritation - Category 2 Serious Eye Damage Eye Irritation - Category 2A Acute toxicity oral, Category 3
	Potential Ecological Effects Summary	Acute Hazards to the aquatic environment – Category 3
	Classification as per EC 1272/2008 (CLP/GHS)	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

Hazardous Materials Information System (HMIS) Rating	Health	2
	Flammability	0
	Physical Hazard	0
	Protective Equipment	C

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 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
Precautionary statements	H402	Harmful to aquatic life
	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.
	P302/P352	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

Chemical name CAS # EINECS #	% w/w	US OSHA	GHS/EU CLP	WHMIS
Silicate compound Proprietary Proprietary	60-70	Corrosive	Corrosive, Category 1B H314-H335 P261-P280-P305 + P351 + P338-P310	Class E Corrosive 
Citrate compound Proprietary Proprietary	15-20	Corrosive	Irritant, Category 2 H319 P305 + P351 + P338	Class D2B: Toxic Material at > 1% 
Polyphosphate Proprietary Proprietary	10-15	Corrosive	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	E, Corrosive 
Surfactant Proprietary Proprietary	1-5	Corrosive, liquid Combustible	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.	B3 Combustible E Corrosive 
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	E, Corrosive 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.

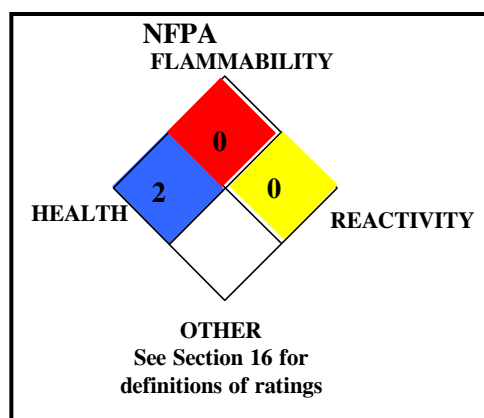
4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary:

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 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

	Halon	YES	Other	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).			
	<u>Explosion Sensitivity to Mechanical Impact:</u> Not applicable.			
	<u>Explosion Sensitivity to Static Discharge:</u> 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-incident 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	<p>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.</p> <p>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.</p> <p>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.</p>
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

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLVs		OSHA-PELs		IDLH mg/m ³	OTHER mg/m ³
			TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³		
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).		Balance	None of the other components contribute significant additional hazards at the concentration present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

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	Odor Threshold	N/A
Melting Point °C	NE	pH (1% aqueous solution)	12.0-12.9
Initial Boiling Point °C	NE	Boiling Point Range °C	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	N/A
Vapor Density (air = 1)	N/A	Vapor Pressure mm Hg @ 20°C:	N/A
Solubility (in water)	Soluble	Relative density (water = 1)	NE
Viscosity	Flowing solid	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	NE		
How To Detect This Substance (Warning Properties):	Litmus paper will turn blue when in contact with solutions of this product.		

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

Toxicity data for hazardous ingredients	Oral LD ₅₀ mg/kg	Dermal LD ₅₀ mg/kg	Inhalation LD ₅₀ mg/kg
Silicate compound	LD ₅₀ (Oral, rat) 1153	N/A Skin irritation (24 hr) severe	N/A
Citrate compound	LD ₅₀ (Oral-Rat) 3 g/kg LD ₅₀ (Oral-Mouse) 5040 mg/kg LD ₅₀ (Intraperitoneal-Rat) 883 mg/kg LD ₅₀ (Intraperitoneal-Mouse) 903 mg/kg LD ₅₀ (Subcutaneous-Rat) 5500 mg/kg LD ₅₀ (Subcutaneous-Mouse) 2700 mg/kg LD ₅₀ (Intraperitoneal-Mouse) 903 mg/kg LD ₅₀ (Intravenous-Rabbit, adult) 330 mg/kg LD ₅₀ (Intravenous-Mouse) 42 mg/kg LDLo (Oral-Rabbit, adult) 7000 mg/kg	LD ₅₀ (dermal, rabbit) > 2000 mg/kg	N/A
	Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects Standard Draize Test (Eye-Rabbit, adult) 750 mg/24 hours: Severe irritation effects		
Polyphosphate	LD ₅₀ (oral, rat) > 7400 mg/kg LDLo (Intravenous-Rabbit, adult) 1580 mg/kg	LDLo (skin, rabbit) > 300 mg/kg	N/A
	Sex Chromosome Loss and Nondisjunction (Oral-Drosophila melanogaster) 11 pph Standard Draize Test (Skin-rabbit) > 300 mg/kg		
Surfactant	N/A	N/A	N/A

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1	Ecotoxicity	LC ₅₀ , mg/L	EC ₅₀ , mg/L
Silicate compound			
	Aquatic	LC ₅₀ (Mosquitofish) = 530 mg/L LC ₅₀ (Waterflea) 48 hours = 113 mg/L LC ₅₀ (Scud) 96 hours = 160 mg/L LC ₅₀ (Polycheate) 28 days = 210-250 □g/L TLm (Mosquitofish) 96 hours = 2320 ppm (fresh water)	NE
	Terrestrial	NE	NE
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. LC ₅₀ fish/96h : 18-32 g/L	EC ₅₀ (daphnia/48h) = 5.6-10 g/L EC ₅₀ (chlorella vulgaris/5d) = >18-32 g/L EC ₁₀ (pseudomonas putita/16h) = EC50/8h ps. fluorescens : >1.800-3.2 g/L
	Terrestrial	NE	NE
Polyphosphate			
	Aquatic	LC ₅₀ 28.5 (Gambusia affinis (Western mosquito fish, adult female)	NE
	Terrestrial	NE	NE
Surfactant			
	Aquatic	NE	NE
	Terrestrial	NE	NE
12.3	Bioaccumulative Potential	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.	
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 <u>if large volumes</u> 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	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

PROGRAM	Silicate compound	Citrate compound	Polyphosphate	Surfactant
US EPA PROGRAMS				
Clean Air Act Hazardous Air Pollutants	NO	NO	NO	NO
Safe Drinking Water Act	NO	NO	NO	NO
RCRA F, K, P, U or D-lists	NO	D001	NO	NO
SARA 302 RQ	NO	NO	NO	NO
SARA 302 TPQ	NO	NO	NO	NO
SARA 313 LISTED	NO	NO	NO	NO
SARA CHEMICAL CATEGORIES				
SARA 311/312 ACUTE	YES	YES	NO	YES

SARA 311/312 CHRONIC	YES	YES	NO	NO
SARA 311/312 FIRE	NO	NO	NO	NO
SARA 311/312 PRESSURE	NO	NO	NO	NO
SARA 311/312 REACTIVITY	NO	YES	NO	NO
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO	NO	NO	NO
CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)				
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)				
US OSHA PROGRAMS				
PEL	NO	NO	NO	NO
PSM	NO	NO	NO	NO
CHEMICAL SECURITY PROGRAMS				
DHS CFATS	NO	NO	NO	NO
CHEMICAL WEAPONS CONVENTION				
	NO	NO	NO	NO
US DRUG ENFORCEMENT ADMINISTRATION				
DEA Controlled Substances	NO	NO	NO	
CHEMICAL INVENTORY PROGRAMS				
WHMIS	E	C, D2B	D2B	B3, E
DSL	YES	YES	YES	YES
NDSL	N/A	N/A	N/A	N/A
REACH Pre-registered List	YES	YES	YES	YES
TSCA	YES	YES	YES	YES
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES	YES	YES
EU No-Longer Polymers List (NLP)	N/A	N/A	N/A	N/A
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	Xi	NO	Xi	NO
Philippines	YES	YES	YES	YES
Japan	YES	YES	YES	YES
Australia	YES	YES	YES	YES
Korea	YES	YES	YES	YES
China	YES	YES	YES	YES
New Zealand Inventory of Chemicals	YES	YES	YES	YES

16. OTHER INFORMATION

- 16.1 Original Preparation
16.2 Revision History
16.3 Prepared by

16.4 Date of Printing

January 5, 2009
GHS 11 Dec 2013
ADVANCED CHEMICAL SAFETY, Inc.
PO Box 152329
San Diego, CA 92195
(858)-874-5577
April 22, 2015

DEFINITIONS OF TERMS

16.5	A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:	
	Section 2	<p>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</p>
	Section 3	<p>CAS #: Chemical Abstract Service index number EINECS #: European Chemical Substances Information System index number</p>
	Section 5	<p>NFPA: 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 Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".</p> <p>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.</p>
	Section 8	<p>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.</p>
	Section 11	<p>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. 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.</p>
	Section 12	<p>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 is affected.</p>
	Section 13	US EPA Hazardous Waste Codes: refer to 40 CFR 261.20
	Section 14	<p>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</p>
	Section 15	<p>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</p>