



### 1. Company and Product Identification

1.1	Identification – Product Name:	<b>RoClean L403</b>
1.2	Other means of identification Synonym:	Organic / Inorganic acid mixture Mixture, none
1.3	Recommended Use Of The Chemical and Restrictions On Use:	Reverse osmosis membrane cleaner Use only as directed on the label.
1.4	Name, Address, And Telephone Number Of The Manufacturer, Or Other Responsible Party:	<b>AVISTA TECHNOLOGIES</b> 140 Bosstick Street San Marcos, CA 92069 (760) 744-0536
	Competent Person email address	klindsey@avistatech.com
1.5	24 Hour Emergency No.:	1-800-424-9300 (United States) 1-202-483-7616 (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 a clear, colorless to amber-colored, corrosive solution with a light, disinfectant odor. Depending on the duration of contact, over-exposures can moderately to severely irritate the skin or eyes, or cause burns. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. carbon monoxide, carbon dioxide, phosphorous oxides, and sodium oxide). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.*

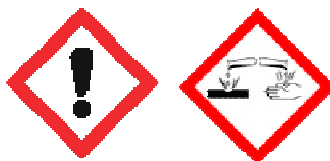
2.1	Physical Hazards Summary	None
	Potential Health Hazards Summary	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 A STOT repeated exposure category 2
	Potential Ecological Effects Summary	The components of this product will decompose into other organic and inorganic compounds over time under normal environmental conditions
2.1	Classification Of Product	
	U.S. OSHA classification	Corrosive, Skin, eye irritant
	Classification as per EC 1272/2008 (CLP/GHS)	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 A STOT repeated exposure category 2
	WHMIS classification	E, corrosive

Hazardous Materials Information System (HMIS) Rating

<b>Health</b>	<b>2</b>
<b>Flammability</b>	<b>0</b>
<b>Physical Hazard</b>	<b>0</b>
<b>Protective Equipment</b>	<b>C</b>

2.2 Label Elements OSHA/GHS


General Warnings	P101 P102 P103 P403 P233	If medical advice is needed, have product container or label at hand. Keep out of reach of children. Read label before use Store in a well-ventilated place. Keep container tightly closed
Signal Word	WARNING!	
Hazard statements	H319 H 312 H332 H314	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Harmful in contact with skin Harmful if inhaled Causes severe skin burns and eye damage
Precautionary statements	P280 P305 P351 P338 P310	Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: rinse extensively with large amounts of water Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. F INGESTED or INHALED Immediately call a POISON CENTER or doctor/physician.
Hazard pictograms		



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
Inorganic phosphorous compound Proprietary Proprietary	25-35	Corrosive	Acute Oral Toxicity, category 4 Skin irritation, category 2B Eye irritation category 2 B STOT repeated exposure category 2 Xn Harmful; R 22-36-38; S2-13-24-25-26-36-46 Keep out of reach of children. Keep away from food, drink and animal feeding stuffs. Avoid contact with skin. Avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.	E, corrosive

			Wear suitable protective clothing. If swallowed, seek medical advice immediately and show this container or label	
Chelate Proprietary Proprietary	25-35	Irritant	Eye Irritant, Category 2A H319 P305 + P351 + P338	Class D2B: Toxic Material at > 1% 
Organic acid Proprietary Proprietary	10-20	Corrosive	Irritant, Category 2 H319 P305 + P351 + P338	Class D2B: Toxic Material at > 1%

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 mist 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.

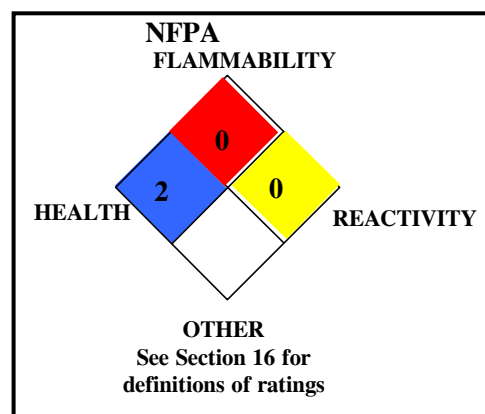
### 4.3 Indication Of Immediate Medical Attention And Special Treatment Needed, If Necessary:

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

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 aqueous solution



Autoignition Temperature °C: Not applicable.

Flammable Limits (in air by volume, %):

Upper: Not applicable.

Lower: Not applicable.

- 5.1 Suitable And Unsuitable Extinguishing Media: This material will 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          | 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 L), clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incident releases (more than 20 L) 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 acid mist and 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 Vacuum or soak- up solids liquid for recovery/disposal. Neutralize residue with sodium bicarbonate or other neutralizing agent for dilute acids. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residues in a suitable plastic container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).

## 7. HANDLING and STORAGE

### 7.1 Precautions for Safe Handling

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

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

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

### 7.2 Conditions For Safe Storage

Store 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. 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 bases, oxidizers, and water reactive materials.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

### 8.1 Control Parameters

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL			OTHER
			TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	TWA mg/m <sup>3</sup>	STEL mg/m <sup>3</sup>	IDLH mg/m <sup>3</sup>	
Inorganic phosphorous compound	Proprietary	25 - 35	1	3	1	3	1000	NIOSH REL: TWA = 1 STEL= 3
Chelate	Proprietary	25 - 35	NE	NE	NE	NE	NE	NE
Organic acid	Proprietary	10 - 20	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 (1910.134-1998).

#### 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 a clear, colorless to amber-colored liquid.		
Odor	Light disinfectant odor	Odor Threshold	NE
Freezing Point °C	< 0	pH (2% solution)	2.5-3.5
Initial Boiling Point °C	> 100	Boiling Point Range °C	N/A
Flammability	Non-flammable	Evaporation Rate (water = 1)	Similar to water
Vapor Density (air = 1)	<1	Vapor Pressure mm Hg @ 20°C:	18 - 20
Solubility (in water)	Soluble	Relative density (water = 1)	1.3-1.4
Viscosity	Similar to water	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	NE		
How To Detect This Substance (Warning Properties):	Litmus paper will turn red in contact with 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 bases, oxidizers, and water reactive materials
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate nitrogen oxides, carbon monoxide, phosphorous oxides, and carbon dioxide.

## 11. TOXICOLOGICAL INFORMATION

Toxicity data for hazardous ingredients	Oral LD <sub>50</sub> mg/kg	Dermal LD <sub>50</sub> mg/kg	Inhalation LD <sub>50</sub> mg/kg
Inorganic phosphorous compound	LD <sub>50</sub> (oral, rat) = 1759 mg/kg	LD <sub>50</sub> (dermal, rabbit) = 3149mg/kg	N/A
	Standard Draize Test (Skin-Rabbit, adult) 595 mg/24 hours: Severe irritation effects Standard Draize Test (Eye effects-Rabbit, adult) 119 mg: Severe irritation effects TDL <sub>o</sub> (Oral-Man) 1286 mL/kg LDL <sub>o</sub> (Unreported-Man) 220 mg/kg		
Chelate	LD <sub>50</sub> (Intraperitoneal-Rat) 1548 mg/kg; Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or function of salivary glands	N/A	N/A
	Standard Draize Test (Skin-Rabbit, adult) 500 mg/24 hours: Moderate irritation effects Standard Draize Test (Eye -Rabbit, adult) 1900 mg Standard Draize Test (Eye-Rabbit, adult) 100 mg/24 hours: Moderate irritation effects		
Organic acid	LD <sub>50</sub> (Oral-Rat) 3 g/kg LD <sub>50</sub> (Oral-Mouse) 5040 mg/kg LD <sub>50</sub> (Intraperitoneal-Rat) 883 mg/kg LD <sub>50</sub> (Intraperitoneal-Mouse) 903 mg/kg LD <sub>50</sub> (Subcutaneous-Rat) 5500 mg/kg LD <sub>50</sub> (Subcutaneous-Mouse) 2700 mg/kg LD <sub>50</sub> (Intraperitoneal-Mouse) LD50: 903 mg/kg LD <sub>50</sub> (Intravenous-Rabbit, adult) 330 mg/kg LD <sub>50</sub> (Intravenous-Mouse) 42 mg/kg LDL <sub>o</sub> (Oral-Rabbit, adult) 7000 mg/kg	LD <sub>50</sub> (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		

## 12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

12.1	Ecotoxicity	LC <sub>50</sub> , mg/L	EC <sub>50</sub> , mg/L
	<b>RoClean L403</b>		
	Aquatic	<i>Daphnia magna</i> > 1000 Fat Head Minnow > 1000	NE
	Terrestrial	NE	NE
12.2	Persistence and Degradability	The components of this product decompose in soil and water.	
12.3	Bioaccumulative Potential	This product is not expected to bioaccumulate	
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	Not applicable as supplied.

## 14. TRANSPORT INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

14.1	UN Number	Not regulated
14.2	UN Proper Shipping Name	Not regulated
14.3	Transport Hazard Class(es)	Not regulated
	Transport label(s) required	Not regulated
14.4	Packing Group	Not regulated
14.5	Marine Pollutant	Not regulated
	NA Emergency Response Guide Number (2012)	Not regulated
14.6	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not regulated
14.7	Special Transport Precautions	Not regulated
	National Motor Freight Classification	#70

### International Air Transport Association

14.8	UN Number	Not regulated
	UN Proper Shipping Name	Not regulated
	Transport Hazard Class(es)	Not regulated
	Transport label(s) required	Not regulated
	Packing Group	Not regulated
	Packaging Instructions	Not regulated

### International Maritime Organization

14.9	UN Number	Not regulated
	UN Proper Shipping Name	Not regulated
	Transport Hazard Class(es)	Not regulated
	Transport label(s) required	Not regulated
	Packing Group	Not regulated
	Marine Pollutant	Not regulated
	NA Emergency Response Guide Number (2012)	Not regulated
	Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not regulated

## 15. SAFETY, HEALTH and ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT

PROGRAM	Inorganic Phosphorous Compound	Chelate	Organic Acid			
<b>US EPA PROGRAMS</b>						
Clean Air Act Hazardous Air Pollutants	NO	NO	NO			
Safe Drinking Water Act	NO	NO	NO			
RCRA F, K, P, U or D-lists	NO	NO	NO			
Epa Priority Pollutant	NO	NO	NO			
SARA 302 RQ	NO	NO	NO			
SARA 302 TPQ	NO	NO	NO			
SARA 313 LISTED	YES	NO	NO			
<b>SARA CHEMICAL CATEGORIES</b>						
SARA 311/312 ACUTE	NO	NO	NO			
SARA 311/312 CHRONIC	NO	NO	NO			
SARA 311/312 FIRE	NO	NO	NO			
SARA 311/312 PRESSURE	NO	NO	NO			
SARA 311/312 REACTIVITY	NO	NO	NO			
EPA EXTREMELY HAZARDOUS SUBSTANCE	NO	NO	NO			
<b>CALIFORNIA SAFE DRINKING WATER ACT (Proposition 65)</b>						
This product does not contain any chemical listed on the California Safe Drinking Water Act list (Proposition 65)						
<b>US OSHA PROGRAMS</b>						
PEL	NO	NO	NO			
PSM	NO	NO	NO			
<b>CHEMICAL SECURITY PROGRAMS</b>						
DHS CFATS	NO	NO	NO			
<b>CHEMICAL WEAPONS CONVENTION</b>						
	NO	NO	NO			
<b>US DRUG ENFORCEMENT ADMINISTRATION</b>						
DEA Controlled Substances	NO	NO	NO			
<b>CHEMICAL INVENTORY PROGRAMS</b>						
WHMIS	NO	NO	NO			
DSL	YES	YES	YES			
NDSL	N/A	N/A	N/A			
REACH Pre-registered List	YES	YES	YES			



TSCA	YES	YES	YES			
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES	YES			
EU No-Longer Polymers List (NLP)	N/A	N/A	N/A			
EEC Classification Packaging, and Labeling of Dangerous Substances(Annex 1)	Corrosive	NO	NO			
Philippines	YES	YES	YES			
Japan	YES	YES	YES			
Australia	YES	YES	YES			
Korea	YES	YES	YES			
China	YES	YES	YES			
New Zealand Inventory of Chemicals	YES	YES	YES			

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## 16. OTHER INFORMATION

16.1	Original Preparation	July 2, 1999
16.2	Revision History	February 19, 2004, 28 June 2013; GHS update
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	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><b>GHS:</b> Global Harmonization System  <b>OSHA:</b> U.S. Occupational Safety and Health Administration.  <b>CLP:</b> Classification and Packaging  <b>WHMIS:</b> Workplace Hazardous Materials Information System  <b>STOT:</b> Specific Target Organ Toxicity</p>
	Section 3	<p><b>CAS #:</b> Chemical Abstract Service index number  <b>EINECS #:</b> European Chemical Substances Information System index number</p>
	Section 5	<p><b>NFPA:</b> Nation Fire Protection Association  <b>Health Hazard: 0</b> (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); <b>1</b> (materials that on exposure under fire conditions could cause irritation or minor residual injury); <b>2</b> (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); <b>3</b> (materials that can on short exposure could cause serious temporary or residual injury); <b>4</b> (materials that under very short exposure could cause death or major residual injury). <b>Flammability Hazard</b>  <b>Reactivity Hazard:</b> Refer to definitions for "Hazardous Materials Identification System".</p> <p><b>Flash Point:</b> Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air.  <b>Autoignition Temperature:</b> The minimum temperature required to initiate combustion in air with no other source of ignition.  <b>LEL:</b> The lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. <b>UEL:</b> 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><b>ACGIH</b> - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.  <b>TLV</b> - 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 (<b>TWA</b>), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (<b>C</b>). Skin absorption effects must also be considered  <b>PEL</b> - 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.  <b>IDLH</b> - 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. <b>The DFG - MAK</b> is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. <b>NIOSH</b> is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (<b>OSHA</b>). NIOSH issues exposure guidelines called <b>Recommended Exposure Levels (RELs)</b>. When no exposure guidelines are established, an entry of <b>NE (Not Established)</b> is made for reference.</p>
	Section 11	<p><b>LD<sub>50</sub></b> : Lethal Dose (solids &amp; liquids) which kills 50% of the exposed animals;  <b>LC<sub>50</sub></b> : Lethal Concentration (gases) which kills 50% of the exposed animals;  <b>ppm</b>: Concentration expressed in parts of material per million parts of air or water;  <b>mg/m<sup>3</sup></b> : Concentration expressed in weight of substance per volume of air;  <b>mg/kg</b>: Quantity of material, by weight, administered to a test subject, based on their body weight in kg  <b>IARC</b> - the International Agency for Research on Cancer;  <b>NTP</b> - the National Toxicology Program,  <b>RTECS</b> - the Registry of Toxic Effects of Chemical Substances,  <b>OSHA and CAL/OSHA.</b>  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.  <b>TDLo</b>, the lowest dose to cause a symptom and  <b>TCLo</b> the lowest concentration to cause a symptom;  <b>TDo, LDLo, and LDo, or TC, TCo, LCLo, and LCo</b>, the lowest dose (or concentration) to cause lethal or toxic effects.  <b>BEI</b> - 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><b>LC<sub>50</sub></b>: The lowest concentration in water which kills 50% of the test subjects.  <b>EC<sub>50</sub></b>: The Effect Concentration in water at which 50% of the test species is affected.</p>
	Section 13	<b>US EPA Hazardous Waste Codes:</b> refer to 40 CFR 261.20
	Section 14	<p><b>DOT:</b> US Department of Transportation  <b>IATA:</b> International Air Transport Association  <b>IMO:</b> International Maritime Organization  <b>MARPOL:</b> International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978  <b>IBC Code</b> : Merchant Shipping Code</p>
	Section 15	<p><b>RCRA:</b> US Resource Conservation and Recovery Act  <b>SARA:</b> US Superfund Amendments and Reauthorization Act  <b>PSM:</b> US OSHA Process Safety Management  <b>CFATS:</b> US Department of Homeland Security Chemical Facility Anti-terrorism Standard  <b>DSL:</b> Canadian Domestic Substances List  <b>NDSL:</b> Canadian Non-Domestic Substances List  <b>REACH:</b> European Registration, Evaluation, Authorization and Restriction of Chemicals list  <b>TSCA:</b> US Toxic Substances Control Act</p>