

## 1. Company and Product Identification

- 1.1 Identification – Product Name: **Vitec**<sup>®</sup> 3000
- 1.2 Other means of identification: Organo-phosphorous compounds  
 Synonym: Mixture, none
- 1.3 Recommended Use of the Chemical and Restrictions on Use: Reverse osmosis membrane antiscalant  
 Use only as directed on the label.
- 1.4 Name, Address, and Telephone: **AVISTA TECHNOLOGIES**  
 Number of the Manufacturer, or Other Responsible Party: 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)  
 1-703 527-3887 (International Collect)



CERTIFIED BY NSF INTERNATIONAL TO NSF/ANSI 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 7 mg/l.

## 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** This product is a clear, amber liquid. This product may irritate contaminated tissue. This product is neither reactive nor flammable.

- Physical Hazards Summary: None
- Potential Health Hazards Summary: Skin corrosion/irritation, Category 2  
 Serious Eye Damage Category 2
- Potential Ecological Effects Summary: None
- 2.1 Classification of Product
- U.S. OSHA classification: Skin corrosion/irritation, Category 2  
 Serious Eye Damage Category 2
- Classification as per EC 1272/2008 (CLP/GHS): Skin corrosion/irritation, Category 2  
 Serious Eye Damage Category 2
- WHMIS classification: Skin corrosion/irritation, Category 2  
 Serious Eye Damage Category 2

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>

## 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
Signal Word	WARNING	
Hazard statements	H315	Causes skin irritation
	H319	Causes serious eye irritation
Precautionary statements	P271	Use only outdoors or in a well-ventilated area.
	P281	Use personal protective equipment as required.
	P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P302+P352	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
	P261	IF IN EYES: Rinse cautiously with water for several minutes.
	P305 + P351 + P338	Remove contact lenses, if present and easy to do. Continue rinsing
	P337+P313	If skin or eye irritation occurs, get medical attention;
	P353	Rinse skin with water/shower.

## 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
Deflocculant & Sequestrant Proprietary Proprietary	20-30	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2
Chelate Agent Proprietary Proprietary	10-20	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2
Water or other chemicals do not contribute to any additional hazards of this product	balance	N/A	N/A	N/A
PRODUCT	100	Skin corrosion/irritation, Category 2 Serious Eye Damage Category 2		

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

Canada HMIRA Registration: Registration Number: 3329893. Registration date: 10 May 2019

## 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 vapors, mists, or sprays 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:

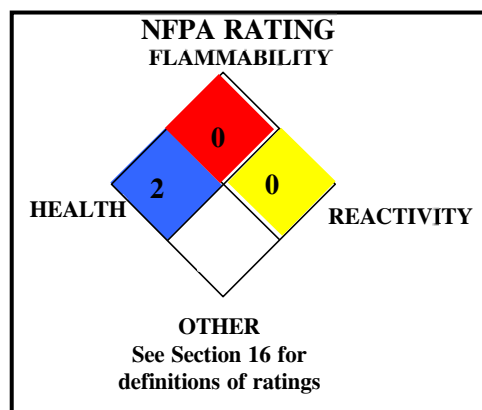
**TARGET ORGANS:** Acute: Skin, eyes. Chronic: Skin.

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 SDS to physician or health professional with victim.

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## 5. FIRE-FIGHTING MEASURES

Flammable properties    Non-flammable solution    aqueous



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:	<p>This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.</p> <table border="0"> <tr> <td>Water spray</td> <td>YES</td> <td>Carbon dioxide</td> <td>YES</td> </tr> <tr> <td>Foam</td> <td>YES</td> <td>Dry chemical</td> <td>YES</td> </tr> <tr> <td>Halon</td> <td>YES</td> <td>Other</td> <td>YES</td> </tr> </table>	Water spray	YES	Carbon dioxide	YES	Foam	YES	Dry chemical	YES	Halon	YES	Other	YES
Water spray	YES	Carbon dioxide	YES											
Foam	YES	Dry chemical	YES											
Halon	YES	Other	YES											
5.2	Specific Hazards Arising from Chemical:	<p>When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and phosphorous oxides).</p> <p><u>Explosion Sensitivity to Mechanical Impact:</u> Not sensitive.  <u>Explosion Sensitivity to Static Discharge:</u> Not sensitive.</p>												
5.3	Special Protective Equipment and Precautions for Fire-Fighters:	<p>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.</p>												

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## 6. ACCIDENTAL RELEASE MEASURES

6.1	Personal Precautions	<p>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.</p>
	Protective equipment	<p>For small releases (&lt; 5 gallons), 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 5 gallons) 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.</p>
	Emergency procedures	<p>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.</p>
6.2	Methods and Materials for Containment and Cleaning Up	<p>Soak up or wet vacuum spilled liquid. 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 container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate local standards (see Section 13, Disposal Considerations).</p>

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## 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 liquid; 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 mists and sprays 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	<p>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.</p>

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, strong oxidizers, very strong acids, water reactive materials.

## 8. EXPOSURE CONTROLS - PERSONAL PROTECTION

### 8.1 Control Parameters

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR					
		ACGIH-TLV		OSHA-PEL			OTHER
		TWA	STEL	TWA	STEL	IDLH	
		mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>
Deflocculant & Sequestrant	Proprietary	NE	NE	NE	NE	NE	NE
Chelate agent	Proprietary	NE	NE	NE	NE	NE	NE

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

### 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 practical. 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., Neoprene or Nitrile).

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, amber liquid.		
Odor	Light disinfectant odor	Odor Threshold	N/A
Melting Point °C	Similar to water	pH	10.7-11.8
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)	Similar to water	Vapor Pressure mm Hg @ 20°C:	18
Solubility (in water)	Soluble	Relative density (water = 1)	1.2- 1.3
Viscosity	Similar to water	Oil-Water Partition Coefficient	N/A
Decomposition Temperature	N/A		
How To Detect This Substance (Warning Properties):	The color and odor may act as warning properties associated with 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 bases, strong oxidizers, very strong acids, water reactive materials.
10.6	Hazardous Decomposition Products	Thermal decomposition of this product may generate carbon monoxide, carbon dioxide, and phosphorus oxides.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on Toxicological Effects

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
Deflocculant & Sequestrant	N/A	N/A	N/A
Chelate agent	LD <sub>50</sub> (Oral-Rat) 2100 mg/kg LD <sub>50</sub> (Skin-Rabbit) > 6310 mg/kg LD <sub>50</sub> (Oral-Quail) > 2510 mg/kg LD <sub>50</sub> (Oral-Duck) > 2510 mg/kg TDLo (Oral-Rat) 1302 mg/kg/31 days-intermittent: Kidney, Urethra, Bladder: other changes in urine composition; Nutritional and Gross Metabolic: weight loss or decreased weight gain, changes in sodium.	Standard Draize Test (Skin-Rabbit) 500 mg/24 hours Standard Draize Test (Eye-Rabbit) 100 mg: Moderate	N/A

Potential routes of exposure	Inhalation, skin contact, eye contact										
Potential effects of acute over-exposure	Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.										
Potential effects of chronic over-exposure	Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Symptoms may include tingling, redness, and visible injury.										
Symptoms of over-exposure	Immediate: Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. 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.										
Conditions aggravated by over-exposure	Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.										
Recommendations to physicians:	Treat symptoms and eliminate exposure.										
Irritation	YES This product can be irritating to contaminated tissue.										
Sensitization	NO										
Carcinogenicity	<table border="0" style="width: 100%;"> <tr> <td style="width: 25%;">NTP</td> <td style="width: 25%;">IARC</td> <td style="width: 25%;">US OSHA</td> <td style="width: 25%;">CAL OSHA</td> <td style="width: 20%;">67/548 EEC Annex 1</td> </tr> <tr> <td>NO</td> <td>NO</td> <td>NO</td> <td>NO</td> <td>NO</td> </tr> </table>	NTP	IARC	US OSHA	CAL OSHA	67/548 EEC Annex 1	NO	NO	NO	NO	NO
NTP	IARC	US OSHA	CAL OSHA	67/548 EEC Annex 1							
NO	NO	NO	NO	NO							
Mutagenicity	NO										
Reproductive toxicity	NO										
Biological Exposure Index	N/A										
Other potential health effects	Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.										

## 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>Vitec® 3000</b>		
Aquatic	LC50 ( <i>Mysidopsis bahai</i> ) > 1000 mg/L 7 days LC50 ( <i>Oncorhynchus mykiss</i> : Rainbow Trout), 96 hours, >1000 mg/L	EC <sub>50</sub> ( <i>Daphnia magna</i> ) 48 hours = >1000 mg/L NOEC ( <i>Daphnia magna</i> ) 48 hours = 1000 mg/L
Terrestrial	N/A	N/A
Aquatic	Acute Hazard Level: Lethal pH (goldfish) = 10.9 Lethal pH (bluegill) = 10.5 LC <sub>100</sub> ( <i>Cyprinus carpio</i> ) 24 hours = 180 ppm/25°C TL <sub>m</sub> (mosquito fish) 96 hours = 125 ppm/ fresh water TL <sub>m</sub> (bluegill) 48 hours = 99 mg/L/ tap water	N/A
Terrestrial	N/A	N/A
12.2 Persistence and Degradability	The components of this product decompose in soil and water.	
12.3 Bioaccumulative Potential	The components of this product are not expected to bioaccumulate.	
12.4 Mobility in Soil	Moderately mobile.	
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.

## 14. TRANSPORTATION 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 applicable
14.2 UN Proper Shipping Name	Not applicable
14.3 Transport Hazard Class(es)	Not applicable
Transport label(s) required	Not applicable
14.4 Packing Group	Not applicable
14.5 Marine Pollutant	Not applicable
NA Emergency Response Guide Number (2016)	Not applicable
14.6 Transport in Bulk (Annex II of MARPOL 73/78 and IBC Code)	Not applicable
14.7 Special Transport Precautions	Not applicable

**International Air Transport Association**

UN Number	Not applicable
UN Proper Shipping Name	Not applicable
Transport Hazard Class(es)	Not applicable
Transport label(s) required	Not applicable
Packing Group	Not applicable
IATA Emergency Response Code	Not applicable
Excepted Quantity	Not applicable
Packaging Instructions	Not applicable

**International Maritime Organization**

UN Number	Not applicable
UN Proper Shipping Name	Not applicable
Transport Hazard Class(es)	Not applicable
Transport label(s) required	Not applicable
Packing Group	Not applicable
Marine Pollutant	Not applicable
NA Emergency Response Guide Number (2016)	Not applicable
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	Deflocculant & Sequestrant	Chelate Agent
<b>US EPA PROGRAMS</b>		
Clean Air Act Hazardous Air Pollutants	NO	NO
Safe Drinking Water Act	NO	NO
RCRA F, K, P, U or D-lists	NO	NO
SARA 302 RQ	NO	NO
SARA 302 TPQ	NO	NO
SARA 313 LISTED	NO	NO
<b>SARA CHEMICAL CATEGORIES</b>		
SARA 311/312 ACUTE	YES	YES
SARA 311/312 CHRONIC	NO	NO
SARA 311/312 FIRE	NO	NO
SARA 311/312 PRESSURE	NO	NO
SARA 311/312 REACTIVITY	NO	NO
EPA EXTREMELY HAZARDOUS SUBSTANCE	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
PSM	NO	NO



CHEMICAL SECURITY PROGRAMS		
DHS CFATS	NO	NO
CHEMICAL WEAPONS CONVENTION		
	NO	NO
US DRUG ENFORCEMENT ADMINISTRATION		
DEA Controlled Substances	NO	NO
CHEMICAL INVENTORY PROGRAMS		
DSL	YES	YES
REACH Pre-registered List	YES	YES
TSCA	YES	YES
TSCA Reset Rule	All ingredients in this product comply with the U.S. EPA TSCA Inventory Notification Requirements Rule (40 CFR 710 Subpart B.)	
European Inventory of Existing Commercial Chemical Substances (EINECS)	YES	YES
EU No-Longer Polymers List (NLP)	NO	NO
Philippines	YES	YES
Japan	YES	YES
Australia	YES	YES
Korea	YES	YES
China	NO	NO
New Zealand Inventory of Chemicals	YES	YES

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## 16. OTHER INFORMATION

16.1	Original Preparation	14 Nov 2005; update 11 April 2011
16.2	Revision History	13 March 2013 Reformatted to GHS Requirements; 16 July13 added aquatic toxicity data for product; 2 August 2016 format update; 12 January 2018 proprietary information format update; 9 April 2018 Section 12 addition; 15 Oct 2018, TSCA Reset Rule update.; 28 June 2019 Hazard review,
16.3	Prepared by	ADVANCED CHEMICAL SAFETY, Inc. PO Box 152329 San Diego, CA 92195 (858)-874-5577
16.4	Date of Printing	July 15, 2019

## 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 - American Conference of Governmental Industrial Hygienists,</b> a professional association which establishes exposure limits.  <b>TLV - Threshold Limit Value -</b> 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 - Permissible Exposure Limit -</b> 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 (<u>Federal Register</u>: 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 - Immediately Dangerous to Life and Health -</b> 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>