



SAFETY DATA SHEET

Page 1 of 6
SDS-E-CL-ETCH-16

Prepared to OSHA, ACC, ANSI, WHSR, WHMIS, EU & GHS Standards

SDS Revision: 4.0

SDS Revision Date: 12/9/2020

1. PRODUCT & COMPANY IDENTIFICATION

1.1	Product Name:	PCB ETCHANT SOLUTION, (P/N CL-ETCH-16), 16 oz./473 mL
1.2	Chemical Name:	NA
1.3	Synonyms:	CL-ETCH-16
1.4	Trade Names:	PCB Etchant Solution, (P/N CL-ETCH-16)
1.5	Product Uses & Restrictions:	Etchant Solution
1.6	Distributor's Name:	CAIG Laboratories, Inc.
1.7	Distributor's Address:	12200 Thatcher Court, Poway, CA 92064-6876 USA
1.8	Emergency Phone:	CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN205206)
1.9	Business Phone / Fax:	+1 (800) 224-4123

2. HAZARDS IDENTIFICATION

2.1	Hazard Identification:	Prepared in accordance with UN Globally Harmonized standards. Intended to comply with OSHA 29 CFR 1910.1200, Canadian WHMIS and Australian Work Health and Safety standards. This product is classified as a hazardous substance and as dangerous goods according to the classification criteria of WHSR and ADG Code (Australia). WARNING! MAY BE CORROSIVE TO METALS. HARMFUL IF SWALLOWED. CAUSES SERIOUS EYE DAMAGE. MAY CAUSE RESPIRATORY IRRITATION. Classification: Met. Corr. 1; Acute Tox. 4; Eye Dam. 1; STOT SE 3
2.2	Label Elements:	<p><u>Hazard Statements</u> (H): H290 – May be corrosive to metals. H302 – Harmful if swallowed. H318 – Causes serious eye damage. H335 – May cause respiratory irritation.</p> <p><u>Precautionary Statements</u> (P): P234 – Keep only in original packaging. P261 – Avoid breathing dust/ vapors. P264 – Wash thoroughly after handling. P270 – Do not eat, drink or smoke when using this product. P271 – Use only outdoors or in a well-ventilated area. P280 – Wear eye protection/face protection. P301+P312 – IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. P330 – Rinse mouth. P304+P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 – immediately call a POISON CENTER doctor. P390 – Absorb spillage to prevent material-damage. P406 – Store in a corrosion resistant container with a resistant inner liner. P403+P233 – Store in a well-ventilated place. Keep container tightly closed. P405 – Store locked up. P501 – Dispose of contents/container through licensed treatment, storage, or disposal facility.</p>
2.3	Other Warnings:	In the event of an exposure or medical inquiry involving this product, please contact a physician or local poison control center, who may seek advice from the U.S. manufacturer, and show them this SDS. KEEP OUT OF REACH OF CHILDREN.



3. COMPOSITION & INGREDIENT INFORMATION

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m ³)									OTHER
					ACGIH		NOHSC			OSHA				
					ppm		ppm			ppm				
TLV	STEL	ES-TWA	ES-STEL	ES-PEAK	PEL	STEL	IDLH							
WATER (AQUA)	7732-18-5	ZC0110000	231-191-2	40-70	NA	NA	NF	NF	NF	NA	NA	NA		
FERRIC CHLORIDE	7705-08-0	LJ9100000	231-729-4	30-60	1	1	NF	NF	NF	NA	NA	NA	Fe SOLID	
					Met. Corr. 1; Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; H290, H302, H315, H318									
FERROUS CHLORIDE	7758-94-3	NO5400000	231-843-4	NA	1	1	NF	NF	NF	NA	NA	NA	Fe SOLID	
					Met. Corr. 1; Acute Tox. 4; Eye Dam. 1; H290, H302, H318									
HYDROCHLORIC ACID	7647-01-0	MW4025000	231-595-7	0.1-1.0	2	5	5	7.5	5	5	7	50		
					Skin Corr. 1B, STOT SE 3; H314, H335									

4. FIRST AID MEASURES

4.1	First Aid:	<p><u>Eyes:</u> As a precaution remove contact lenses if worn and flush eyes thoroughly with copious amounts of water for at least 15 minutes, holding eyelid(s) open to ensure complete flushing. If irritation persists, seek immediate medical attention.</p> <p><u>Skin:</u> Remove contaminated clothing. Use a waterless hand cleaner, mineral oil, or petroleum jelly to remove the material. Then wash the skin with soap and water. If irritation persists, seek prompt medical attention. Do not wear contaminated clothing until after it has been properly cleaned.</p> <p><u>Ingestion:</u> Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately.</p> <p><u>Inhalation:</u> Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor of hot product immediately remove victim to fresh air at once. If breathing is difficult, administer supplemental oxygen and seek immediate medical attention. If breathing stops, perform artificial respiration.</p>
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SAFETY DATA SHEET

Page 2 of 6
SDS-E-CL-ETCH-16

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SDS Revision Date: 12/9/2020

4. FIRST AID MEASURES – cont'd

4.2	Effects of Exposure:	<p><u>Eyes:</u> This product can cause transient eye irritation and discomfort, tearing and blurred vision with short-term contact with liquid sprays or mists.</p> <p><u>Skin:</u> This product can cause transient skin irritation with short-term exposure.</p> <p><u>Ingestion:</u> If swallowed, may lead to vomiting, reduced appetite abdominal pain, lethargy, tar like stools, diarrhea, fast and weak pulse, hypertension, dehydration, acidosis, and coma.</p> <p><u>Inhalation:</u> Severe respiratory irritation (from vapors or mists) is possible. Inhalation of fumes can cause upper respiratory tract and lung irritation. Aspiration of liquid into the lungs can cause lung damage.</p>															
4.3	Symptoms of Overexposure:	<p><u>Eyes:</u> Eye irritation and discomfort, tearing and blurred vision.</p> <p><u>Skin:</u> Transient skin irritation with short-term exposure. Can cause serious skin damage with repeated exposure.</p> <p><u>Ingestion:</u> If swallowed, may lead to vomiting, reduced appetite abdominal pain, lethargy, tar like stools, diarrhea, fast and weak pulse, hypertension, dehydration, acidosis, and coma.</p> <p><u>Inhalation:</u> Severe respiratory irritation (from vapors or mists) is possible. Inhalation of fumes can cause upper respiratory tract and lung irritation. Aspiration of liquid into the lungs can cause lung damage.</p>															
4.4	Acute Health Effects:	<p><u>Eyes:</u> Possible discoloration of the eye tissues, eye irritation and discomfort, tearing and blurred vision. Eye corrosion with corneal or conjunctival ulceration.</p> <p><u>Skin:</u> Prolonged skin contact may cause skin burns or ulceration. Ferric chloride has been infrequently associated with skin sensitization in humans.</p> <p><u>Ingestion:</u> Ingestion higher doses may lead to abnormal liver function with nausea and vomiting, reduced appetite abdominal pain, lethargy, tarry stools, diarrhea, fast and weak pulse, hypertension, dehydration, acidosis, and coma. Temporary alteration of the heart's electrical activity may result in irregular pulse palpations or inadequate circulation. If death does not occur immediately, symptoms may clear in a few hours but return within a day with cyanosis, pulmonary edema, shock, convulsions, acidosis, fever and death.</p> <p><u>Inhalation:</u> Severe respiratory irritation (from vapors or mists) is possible. Inhalation of fumes can cause upper respiratory tract and lung irritation. At elevated temperatures or through mechanical action, may form vapors, mist or fumes that may be irritation to the eyes, nose, throat and lungs.</p>															
4.5	Chronic Health Effects:	Abnormal liver function with nausea and vomiting, reduced appetite abdominal pain, lethargy, tarry stools, diarrhea, fast and weak pulse, hypertension, dehydration, acidosis, and coma. Temporary alteration of the heart's electrical activity may result in irregular pulse palpations or inadequate circulation. If death does not occur immediately, symptoms may clear in a few hours but return within a day with cyanosis, pulmonary edema, shock, convulsions, acidosis, fever and death.															
4.6	Target Organs:	Eyes, Skin, Liver, Respiratory System.															
4.7	Medical Conditions Aggravated by Exposure:	Pre-existing diseases of the liver may have increased susceptibility to the toxicity of repeated exposures.															
		<table border="1"> <tr><td colspan="2">HEALTH</td><td>3</td></tr> <tr><td colspan="2">FLAMMABILITY</td><td>0</td></tr> <tr><td colspan="2">PHYSICAL HAZARDS</td><td>2</td></tr> <tr><td colspan="2">PROTECTIVE EQUIPMENT</td><td>X</td></tr> <tr><td>EYES</td><td>SKIN</td><td></td></tr> </table>	HEALTH		3	FLAMMABILITY		0	PHYSICAL HAZARDS		2	PROTECTIVE EQUIPMENT		X	EYES	SKIN	
HEALTH		3															
FLAMMABILITY		0															
PHYSICAL HAZARDS		2															
PROTECTIVE EQUIPMENT		X															
EYES	SKIN																

5. FIREFIGHTING MEASURES

5.1	Fire & Explosion Hazards:	Not considered to be a fire or explosion hazard. Will react with water to product toxic and corrosive fumes.	
5.2	Extinguishing Methods:	Dry chemical, foam carbon dioxide and water fog.	
5.3	Firefighting Procedures:	Fight fires as for surrounding materials. As in any fire, wear MSHA/NIOSH approved self-contained breathing apparatus (pressure-demand) and full protective gear. Keep containers cool until well after the fire is out. Use water spray to cool fire-exposed surfaces and to protect personal. Fight fire upwind. Avoid spraying water directly into storage containers because of danger of boil-over. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway. Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.	

6. ACCIDENTAL RELEASE MEASURES

6.1	Spills:	<p>Before cleaning any spill or leak, individuals involved in spill cleanup must wear appropriate Personal Protective Equipment.</p> <p>For small spills (e.g., <1 gallon) wear appropriate personal protective equipment (e.g., goggles, gloves). Remove spilled material with absorbent material and place into appropriate closed container(s) for disposal. Dispose of properly in accordance with local, state and federal regulations. Wash all affected areas and outside of container with plenty of warm water and soap. Remove any contaminated clothing and wash thoroughly before reuse.</p> <p>For large spills (e.g., ≥ 1 gallon), deny entry to all unprotected individuals. Dike and contain spill with inert material (e.g., sand or earth). Transfer liquid to containers for recovery or disposal and solid diking material to separate containers for proper disposal. Remove contaminated clothing promptly and wash affected skin areas with soap and water. Keep spills and cleaning runoffs out of municipal sewers and open bodies of water.</p> <p>U.S. EPA regulations require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll-free number for the US Coast Guard's National Response Center is +1 (800) 424-8802.</p>
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SAFETY DATA SHEET

Page 3 of 6
SDS-E-CL-ETCH-16

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SDS Revision: 4.0

SDS Revision Date: 12/9/2020

7. HANDLING & STORAGE INFORMATION

7.1	Work & Hygiene Practices:	Do not eat, drink or smoke when handling this product. Wash hands thoroughly after using this product and before eating, drinking or smoking. Remove soiled clothing to prevent prolonged skin contact. Avoid breathing vapors. Avoid direct skin contact.
7.2	Storage & Handling:	Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.
7.3	Special Precautions:	Clean all spills promptly. Empty containers may contain product residues. Do not reuse empty containers without commercial cleaning or reconditioning

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1	Exposure Limits: ppm (mg/m ³)	CHEMICAL NAME(S)	ACGIH		NOHSC			OSHA			OTHER
			TLV	STEL	ES-TWA	ES-STEL	ES-PEAK	PEL	STEL	IDLH	
		FERRIC CHLORIDE	1	1	NF	NF	NF	NA	NA	NA	Fe SOLID
		FERROUS CHLORIDE	1	1	NF	NF	NF	NA	NA	NA	Fe SOLID
		HYDROCHLORIC ACID	2	5	5	7.5	5	5	7	50	
8.2	Ventilation & Engineering Controls:	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, <i>Industrial Ventilation, A Manual of Recommended Practices</i> , most recent edition, for details.									
8.3	Respiratory Protection:	If the exposure limit is exceeded and engineering controls are not feasible, a half face piece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerin, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.									
8.4	Eye Protection:	Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125 °F (51 °C). Have suitable eye wash water available.									
8.5	Hand Protection:	Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.									
8.6	Body Protection:	Avoid prolonged and/or repeated skin contact. Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing should include long-sleeves, apron, boots and additional facial protection.									

9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Appearance:	Yellow brown deliquescent crystals
9.2	Odor:	Slight odor of hydrochloric acid.
9.3	Odor Threshold:	NA
9.4	pH:	NA
9.5	Melting Point/Freezing Point:	> 37 °C (> 99 °F)
9.6	Initial Boiling Point/Boiling Range:	NA
9.7	Flashpoint:	NA
9.8	Upper/Lower Flammability Limits:	NA
9.9	Vapor Pressure:	1.1 @ 194 °C (381 °F)
9.10	Vapor Density:	NA
9.11	Relative Density:	2.9 g/cm ³ @ 25 °C
9.12	Solubility:	Soluble in water
9.13	Partition Coefficient (log P _{ow}):	NA
9.14	Autoignition Temperature:	NA
9.15	Decomposition Temperature:	NA
9.16	Viscosity:	NA
9.17	Other Information:	NA

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10. STABILITY & REACTIVITY

10.1	Stability:	Stable under normal conditions.
10.2	Hazardous Decomposition Products:	Emits toxic fumes of chloride when heated to decomposition.
10.3	Hazardous Polymerization:	Will not occur.
10.4	Conditions to Avoid:	Open flames, sparks, high heat, incompatible substances and direct sunlight.
10.5	Incompatible Substances:	Metals, ally chloride, sodium potassium. Will react with water to product toxic and corrosive fumes.

11. TOXICOLOGICAL INFORMATION

11.1	Routes of Entry:	Inhalation: YES	Absorption: YES	Ingestion: YES
11.2	Toxicity Data:	This product has NOT been tested on animals to obtain toxicology data. Toxicology data, found in scientific literature, is available for some of the components of the product. Ferric Chloride: LD ₅₀ (oral, Rat): 316 mg/kg; Hydrochloric Acid: LD ₅₀ (oral, rabbit): 900 mg/kg		
11.3	Acute Toxicity:	See Section 4.4		
11.4	Chronic Toxicity:	See Section 4.5		
11.5	Suspected Carcinogen:	NA		
11.6	Reproductive Toxicity:	This product is not reported to produce reproductive toxicity in humans.		
	Mutagenicity:	Investigated as a mutagen, reproductive effector.		
	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.		
11.7	Irritancy of Product:	See Section 4.3		
11.8	Biological Exposure Indices:	NE		
11.9	Physician Recommendations:	Treat symptomatically.		

12. ECOLOGICAL INFORMATION
















12.1	Environmental Stability:	There are no specific data available for this product.
12.2	Effects on Plants & Animals:	There are no specific data available for this product.
12.3	Effects on Aquatic Life:	There are no specific data available for this product; however, very large releases of this product may be harmful or fatal to overexposed aquatic life. 24-hour LC ₅₀ : 6 mg/L (striped bass fingerling); 24-hour LC ₅₀ : 4 mg/L (striped bass larvae)

13. DISPOSAL CONSIDERATIONS

13.1	Waste Disposal:	Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements
13.2	Special Considerations:	NA

14. TRANSPORTATION INFORMATION

The basic description (ID Number, proper shipping name, hazard class & division, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR.

14.1	49 CFR (GND):	CONSUMER COMMODITY, ORM-D (IP VOL ≤ 5.0 L) – until 12/31/2013 UN2582, FERRIC CHLORIDE SOLUTION, 8, III, LTD QTY (IP VOL ≤ 5.0 L) UN2582, FERRIC CHLORIDE SOLUTION, 8, III (> 5.0 L)	 or 
14.2	IATA (AIR):	UN2582, FERRIC CHLORIDE SOLUTION, 8, III (LTD QTY IP VOL ≤ 0.5 L) UN2582, FERRIC CHLORIDE SOLUTION, 8, III (IP > 0.5 L)	  or 
14.3	IMDG (OCN):	UN2582, FERRIC CHLORIDE SOLUTION, 8, III, LTD QTY (IP VOL ≤ 5.0 L) UN2582, FERRIC CHLORIDE SOLUTION, 8, III (> 5.0 L)	 or 
14.4	TDGR (Canadian GND):	MARK PACKAGE "LIMITED QUANTITY" or "QUANTITÉ LIMITÉE" or "LTD QTY" or "QUANT LTÉE" (IP VOL ≤ 5.0 L) UN2582, FERRIC CHLORIDE SOLUTION, 8, III (> 5.0 L)	 or 
14.5	ADR/RID (EU):	UN2582, FERRIC CHLORIDE SOLUTION, 8, III, LTD QTY (IP VOL ≤ 5.0 L)	 or 
14.6	SCT (MEXICO):	UN2582, FERRIC CHLORIDE SOLUTION, 8, II, CANTIDAD LIMITADA (IP VOL ≤ 5.0 L)	 or 
14.7	ADGR (AUS):	UN2582, FERRIC CHLORIDE SOLUTION, 8, III, LTD QTY (IP VOL ≤ 5.0 L)	 or 

SAFETY DATA SHEET



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15. REGULATORY INFORMATION

15.1	SARA Reporting Requirements:	This product contains <u>Hydrochloric Acid</u> , a substance subject to SARA Title III, Section 313 reporting requirements.
15.2	SARA Threshold Planning Quantity:	<u>Hydrochloric Acid</u> : 2,270 kg (5,000 lbs).
15.3	TSCA Inventory Status:	The components of this product are listed on the TSCA Inventory.
15.4	CERCLA Reportable Quantity (RQ):	<u>Hydrochloric Acid</u> : 2,270 kg (5,000 lbs); <u>Ferric Chloride</u> : 1000 lb (454 kg)
15.5	Other Federal Requirements:	<u>Ferric Chloride (as Fe Solid)</u> and <u>Hydrochloric Acid</u> are listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters. <u>Ferric Chloride</u> , <u>Ferrous Chloride</u> and <u>Hydrochloric Acid</u> are listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA. OSHA considers hydrochloric acid extremely hazardous.
15.6	Other Canadian Regulations:	This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List. WHMIS Class E, D2A
15.7	State Regulatory Information:	<u>Ferric Chloride (as Fe Solid)</u> can be found on the following state criteria lists: California Proposition 65 (CA65), Massachusetts Hazardous Substances List (MA), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ) and Pennsylvania Right-to-Know List (PA). <u>Ferrous Chloride</u> can be found on the following state criteria list: MA, PA, and NJ. <u>Hydrochloric Acid</u> can be found on the following state criteria list: FL, MA, MN, NJ, PA, and WA. No other ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA65), Delaware Air Quality Management List (DE), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI). This product does not contain any chemicals known to the State of California to cause cancer or other reproductive harm. For more information go to www.P65Warnings.ca.gov .
15.8	Other Requirements:	Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII. Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII. This product does not contain any chemicals known to the State of California to cause cancer or other reproductive harm. For more information go to www.P65Warnings.ca.gov .



16. OTHER INFORMATION

16.1	Other Information:	<p>WARNING! MAY BE CORROSIVE TO METALS. HARMFUL IF SWALLOWED. CAUSES SERIOUS EYE DAMAGE. MAY CAUSE RESPIRATORY IRRITATION. Keep only in original packaging. Avoid breathing dust/ vapors. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear eye protection/face protection. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER doctor. Absorb spillage to prevent material-damage. Store in a corrosion resistant container with a resistant inner liner. Store in a well-ventilated place. Keep container tightly closed. Store locked up.</p> <p>KEEP LOCKED UP AND OUT OF REACH OF CHILDREN.</p>
16.2	Terms & Definitions:	See last page of this Safety Data Sheet.
16.3	Disclaimer:	This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's & CAIG Laboratories, Inc.'s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.
16.4	Prepared for:	<p>CAIG Laboratories, Inc. 12200 Thatcher Court Poway, CA 92064-6876 Tel: +1 (800) CAIG-123 (244-4123) Fax: +1 (858) 486-8398 fax http://www.caig.com/</p> 
16.5	Prepared by:	<p>ShipMate, Inc. P.O. Box 787 Sisters, Oregon 97759-0787 USA Tel: +1 (310) 370-3600 Fax: +1 (310) 370-5700 http://www.shipmate.com</p> 

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DEFINITION OF TERMS

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

GENERAL INFORMATION:

CAS No.	Chemical Abstract Service Number
RTECS No.	Registry of Toxic Effects of Chemical Substances Number
EINECS No.	European Inventory of Existing Commercial Chemical Substances Number

EXPOSURE LIMITS IN AIR:

ACGIH	American Conference on Governmental Industrial Hygienists
IDLH	Immediately Dangerous to Life and Health
NOHSC	National Occupational Health and Safety Commission (Australia)
OSHA	U.S. Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average

FIRST AID MEASURES:

CPR	Cardiopulmonary resuscitation - method in which a person whose heart has stopped receives manual chest compressions and breathing to circulate blood and provide oxygen to the body.
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HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard

HEALTH
FLAMMABILITY
PHYSICAL HAZARDS
PERSONAL PROTECTION

PERSONAL PROTECTION RATINGS:

A		G	
B		H	
C		I	
D		J	
E		K	
F		X	Consult your supervisor or SOPs for special handling directions.

Safety Glasses	Splash Goggles	Face Shield & Protective Eyewear	Gloves
Boots	Protective Apron	Protective Clothing & Full Suit	Dust Respirator
Full Face Respirator	Dust & Vapor Half-Mask Respirator	Full Face Respirator	Airline Hood/Mask or SCBA

OTHER STANDARD ABBREVIATIONS:

Carc	Carcinogenic
Irrit	Irritant
NA	Not Available
NR	No Results
ND	Not Determined
NE	Not Established
NF	Not Found
SCBA	Self-Contained Breathing Apparatus
Sens	Sensitization
STOT RE	Specific Target Organ Toxicity – Repeat Exposure
STOT SE	Specific Target Organ Toxicity – Single Exposure

NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:	
Autoignition Temperature	Minimum temperature required to initiate combustion in air with no other source of ignition
LEL	Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source
UEL	Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source

HAZARD RATINGS:

<table border="1"> <tr><td>0</td><td>Minimal Hazard</td></tr> <tr><td>1</td><td>Slight Hazard</td></tr> <tr><td>2</td><td>Moderate Hazard</td></tr> <tr><td>3</td><td>Severe Hazard</td></tr> <tr><td>4</td><td>Extreme Hazard</td></tr> <tr><td>ACD</td><td>Acidic</td></tr> <tr><td>ALK</td><td>Alkaline</td></tr> <tr><td>COR</td><td>Corrosive</td></tr> <tr><td>W</td><td>Use No Water</td></tr> <tr><td>OX</td><td>Oxidizer</td></tr> <tr><td>TREFOIL</td><td>Radioactive</td></tr> </table>	0	Minimal Hazard	1	Slight Hazard	2	Moderate Hazard	3	Severe Hazard	4	Extreme Hazard	ACD	Acidic	ALK	Alkaline	COR	Corrosive	W	Use No Water	OX	Oxidizer	TREFOIL	Radioactive	
0	Minimal Hazard																						
1	Slight Hazard																						
2	Moderate Hazard																						
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ACD	Acidic																						
ALK	Alkaline																						
COR	Corrosive																						
W	Use No Water																						
OX	Oxidizer																						
TREFOIL	Radioactive																						

TOXICOLOGICAL INFORMATION:

LD₅₀	Lethal Dose (solids & liquids) which kills 50% of the exposed animals
LC₅₀	Lethal concentration (gases) which kills 50% of the exposed animal
ppm	Concentration expressed in parts of material per million parts
TD₁₀	Lowest dose to cause a symptom
TCLo	Lowest concentration to cause a symptom
TD₁₀, LD₁₀, & LD₀₁ or TC, TC₀₁, LC₁₀, & LC₀₁	Lowest dose (or concentration) to cause lethal or toxic effects
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances
BCF	Bioconcentration Factor
TL_m	Median threshold limit
log K_{ow} or log K_{oc}	Coefficient of Oil/Water Distribution

REGULATORY INFORMATION:

WHMIS	Canadian Workplace Hazardous Material Information System
DOT	U.S. Department of Transportation
TC	Transport Canada
EPA	U.S. Environmental Protection Agency
DSL	Canadian Domestic Substance List
NDSL	Canadian Non-Domestic Substance List
PSL	Canadian Priority Substances List
TSCA	U.S. Toxic Substance Control Act
EU	European Union (European Union Directive 67/548/EEC)
WGK	Wassergefährdungsklassen (German Water Hazard Class)

WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

Class A	Class B	Class C	Class D1	Class D2	Class D3	Class E	Class F
Compressed	Flammable	Oxidizing	Toxic	Irritation	Infectious	Corrosive	Reactive

CLP/GHS (1272/2008/EC) PICTOGRAMS:

GHS01	GHS02	GHS03	GHS04	GHS05	GHS06	GHS07	GHS08	GHS09
Explosive	Flammable	Oxidizer	Pressurized	Corrosive	Toxic	Harmful Irritating	Health Hazard	Environment