MATERIAL SAFETY DATA SHEET

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Address:
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Emergency: (CHEMTREC) 800-424-9300
Revision Date: April 8, 2013

Product Name: TCE, Trichloroethylene
CAS No: 79-01-6
Chemical Family: Chlorinated Hydrocarbons

SECTION 2 – COMPOSITION / INFORMATION ON INGRREDIENTS

Hazardous Component	CAS #	OSHA PEL	ACGIH TLV	Other Limits (ppm)
Trichloroethylene	79-01-6	100 ppm	50 (A5) ppm	25(NIOSH REL)

SECTION 3 – HAZARDS IDENTIFICATION

Emergency Overview:
Potential Health Effects:
Primary Entry Routes: Ingestion, inhalation and dermal are the primary routes of entry, although other avenues should be considered.

Eye: Severe eye irritant. Liquid splashed into the eye can result in discomfort, pain, and irritation.

Skin: Severe skin irritant. Vapors or liquid may cause irritation, pain and discomfort. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes, increasing the likelihood of skin absorption

Ingestion: Mild to moderately toxic by ingestion. Swallowing this material may result in irritation of the mouth and GI tract along with other effects as listed under inhalation. Vomiting and subsequent aspiration into the lungs may lead to chemical pneumonia and pulmonary edema which is a potentially fatal condition.

Inhalation: Mildly toxic. Product is a central nervous system depressant. Exposure may cause: irritation of the respiratory tract, dizziness, nausea, jaundice, headaches, loss of coordination and equilibrium, possible nervous system damage, and death from severe overexposure (confined spaces or poorly ventilated areas). Fatalities following severe acute exposure have been attributed to ventricular fibrillation resulting in cardiac failures. Forms of addiction have been observed in exposed workers.

Chronic: Prolonged exposure above the OSHA PEL may result in liver and kidney damage. Trichloroethylene has been extensively studied for chronic effects on animals. Trichloroethylene has been found to have experimental Tumorigenic and Tetratogenic effects. Not listed as a human carcinogen or potential carcinogen under NTP or OSHA, assigned a 2A rating by IARC.

SECTION 4 – FIRST AID MEASURES

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes. Consult a physician.

Skin: Remove contaminated clothing. Immediately wash skin with soap and water for at least 15 minutes. If irritation persists consult a physician. Clean contaminated clothing prior to reuse; properly discard all leather soaked with product.

Ingestion: DO NOT induce vomiting; seek medical attention immediately. If vomiting occurs spontaneously keep individual's head below their hips to prevent aspiration of material into the lungs. If unconscious, or in convulsions, take immediately to the hospital. Never administer anything by mouth to an unconscious person. If conscious, drink large amounts of water (at least one quart).

Inhalation: Remove individual to fresh air. If individual is not breathing, provide artificial respiration. If breathing is difficult provide oxygen via licensed/trained individual. Consult a physician immediately.

Notes to Physician: Never administer adrenaline following trichloroethylene exposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure.

SECTION 5 – FIRE FIGHTING MEASURES

Flash Point: None
LEL: 7.8 vol%
Autoignition Temperature: 420 ℃
UEL: 52 vol%

Extinguishing Media: Water mist, dry chemical, foam, and carbon dioxide. Water mist should only be used by trained firefighters.

Fire-Fighting Instructions: Containers exposed to intense heat should be cooled with a water fog to prevent rupture from increased vapor pressure within the container. If containers are in direct contact with flames, use large quantities of water. Due to vapor density ignition sources distant from areas of handling material need to be considered.

This product may decompose when it comes in contact with: open flames, heating elements, electrical arcs (such as electrical motors) or combustion engines. Some mixtures of Chlorinated Hydrocarbons under the right conditions may be combustible if exposed to extreme heat or open flames. Due to vapor density ignition sources distant from areas of handling material need to be considered.

Fire-Fighting Equipment: Do not enter confined spaces without full bunker gear (helmet, bunker coats, gloves, boots, and respiratory protection). This includes a NIOSH/MSHA approved positive pressure self-contained

breathing apparatus for possible exposure to toxic by-products of combustion, as denoted in Section X.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Spills / Leak Procedures: Immediately evacuate the area and provide maximum ventilation. Shut down and or remove all sources of ignition if safe to do so. Unprotected personnel should move upwind of the spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in the area. Take precautions as necessary to prevent contamination of the ground and surface waters. Recover spilled material on absorbents, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including vapors, have been removed, thoroughly wet vacuum the area. DO NOT flush to the sewer. If area is porous, remove as much earth and gravel, etc., as necessary and place in closed containers for disposal.

SECTION 7 – HANDLING AND STORAGE

Handling Precautions: Wear PPE when handling this material. Wash exposed body areas with soap and water prior to using lavatory facilities, consuming food or beverages, or applying cosmetics. must be sufficient to limit employees' exposure. Do NOT use in poorly ventilated or confined-spaces without proper respiratory protection. Do not eat, drink or smoke in work areas. Avoid contact with eyes and skin. Do not ingest. Do not use cutting or welding torches on containers that contained this product, unless, the containers are properly purged and cleaned. Be stored in the original, closed, properly sealed and labeled container. Do not store near or around incompatible materials or in direct sunlight. This material, or its vapors, when in contact with flames, hot glowing surfaces, or electric arcs can decompose to form hydrogen chloride, chlorine, and other toxic by-products.

SECTION 8 –EXPOSURE CONTROLS / PERSONAL PROTECTION

Chemical Name	IARC	NTP
Trichloroethylene	2A	S

Ventilation Requirements: General ventilation is recommended. Local exhaust is recommended where vapors, dusts, or mists may be generated due to work activities.

Respiratory Protection: To limit employees' exposure, OSHA requires that the use of administrative or engineering controls must first be developed and implemented whenever feasible (29 CFR 1910.1000 (e)). When controls are not feasible, and exposure exceeds established limits, then protective equipment such as respirators are recommended. Use only OSHA/NIOSH approved respirators according to the manufacturer's directions and OSHA requirements. Positive pressure, self-contained units (i.e., SCBAs) are required whenever: there is insufficient oxygen, IDLH conditions exist, and when determined necessary by surrounding environmental conditions.

Eye/Face: Splash proof goggles, face shields. Eyewash and safety showers should be available in areas where this product is handled.

Protective Gloves: Use gloves to prevent dermal contact.

Protective Clothing: Aprons should be used when there is a chance for splashing.

Work/Hygienic Practices: Protect all exposed skin from liquid contact. Use chemically resistant equipment.

Special/Other: Use chemical boots as appropriate. Wash clothing prior to reuse. Properly discard contaminated leather products.

NPFA and HMIS Codes	NPFA	HMIS
Health	2	2
Flammability	1	1
Reactivity	0	0
Personal Protection	-	H

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Appearance: clear, colorless
Odor: ether-like odor
pH: 6.7-7.5
Evaporation Rate: ≥0.28
Boiling Point: ≥86-88 ℃
Freezing/Melting Point: -86.8 ℃
%Volatile: 100%
Solubility: 0.11% @ 25 ℃
Vapor Pressure: ≥58 mmHg (20 ℃)
Vapor Density: 4.54(air=1)
Specifics Gravity/Density: 1.465 g/cm3
Autoignition: 420 ℃
Molecular Formula: C_2HCl_3
Molecular Weight: 131.4

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability: Stable
Conditions to Avoid: Avoid contact with open flames, electric arcs, or other sources of ignition.
Incompatibilities with Other Materials: Strong alkalis and oxidizers, finely divided metals such as aluminum, magnesium, or zinc.
Hazardous Decomposition Products: Products of decomposition include: hydrogen chloride, carbon monoxide, carbon dioxide, chlorine, phosgene, and possibly other unidentified organic compounds.
Hazardous Polymerization: Hazardous polymerization does not occur.

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SECTION 11 – TOXICOLOGICAL INFORMATION

Toxicology studies have not been conducted on this product. However, toxicity literature surveys have been conducted on the materials found in Section II.

	LD_{50} (oral-rat)	LD_{50} (dermal-rabbit)	LC_{50} (inhalation-rat)
Trichloroethylene	2,688 mg/kg*	N/D	25,700 ppm/ 1 Hr.

*LD_{LO} lowest published lethal concentration

SECTION 12 – ECOLOGICAL INFORMATION CONSIDERATIONS

	Trichloroethylene
LC_{50} (FAT HEADMINNOWS):	ND
LC_{50} (DAPHNIA MAGNA):	ND
LC_{50} (MYSID SHRIMP):	14 mg/l/96 hr " "
LC_{50} (MARINE ALGA):	95 mg/l/96 hr " "
LC_{50} (SHEEP HEAD MINNOWS):	52 mg/l/96 hr (slightly toxic)

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Recovered liquids which can not be used, contaminated sawdust, vermiculite or other media contaminated with product will require treatment in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated. Care must be taken when using or disposing of chemical materials and/or their containers in accordance with The Clean Air Act, The Clean Water Act, The Resource Conservation and Recovery Act, The Department of Transportation, as well as any other relevant federal, state, or local laws/regulations regarding disposal.

Possible Waste Codes: U228, F001, F002

SECTION 14 – TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME:	Trichloroethylene
HAZARD CLASS:	6.1
IDENTIFICATION NUMBER:	UN 1710
PACKING GROUP:	PG 111
REQUIRED LABELS:	Posion III (6.1)
REPORTABLE QUANTITY:	45.4 kg (100 lb.)

SECTION 15 – REGULATORY INFORMATION

OSHA: This product is subject to the Hazard Communication Standard under 29 CFR 19190.1200 based on the ingredients found in Section II.

STATE: Components of this product are listed under the following state RTK programs:

RCRA: Refer to Section X for information

SARA:

- Section 302 (40 CFR §355): this material does not contain materials found under the extremely hazardous substances list.
- Sections 311/312 (40 CFR §370) this material meets the following EPA hazard categories:

x	Acute health hazard	x	Chronic health hazard
	Fire hazard		Reactive hazard
	Sudden release of pressure hazard		

- Section 313 (40 CFR §372): this product does contain materials which could trigger reporting under the toxic release inventory (Form R's):
  - Trichloroethylene > 90 %
  - Butylene Oxide < 1%

TSCA: All materials in this product are listed in Inventory List.

SECTION 16 – OTHER INFORMATION

N/A = Not Applicable	N/E = Not Established	ST = Short Term Exposure Limit
N/D = Not Determined	S = Suspected	C = Ceiling

ST* = Short Term Exposure, 5-Minute Peak In Any 3 Hours

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