Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements

U.S. Department of Labor

Occupation Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY

JD 311 (210285)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufactured For:	Emergency Telephone Number
Beaver Research Company	1-800-255-3924 (Chem-Tel)
Address (Number, Street, City, State, and ZIP Code)	Telephone Number For Information
3700 E. Kilgore Road, Portage, MI 49002	269-382-0133
HMIS RATINGS: Health: 2 0-Minimal 3-Serious Flammability: 1 1-Slight 4-Severe Reactivity: 0 2-Moderate	Date Prepared 12/24/99 Signature of Preparer (optional)

Chemical Name/Synonyms: Trichloroethene, Trichlorethylene
Chemical Family: Trichlor
Formula: Halogenated Hydrocarbons
CHCL=CCL2 CAS No. 000079-01-6

U.S. DOT Shipping Name: Trichloroethylene
U.S. DOT Hazard Class: 6.1 (Harmful - Stow away from foodstuffs)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	CAS No.	PEL	TWA TLV	Other Limits Recommended	% (optional)
Trichloroethylene	79-01-6	50ppmTWA	50ppmTWA	NIOSH REL = 25ppm (10 hr TWA)	

Section III - Physical/Chemical Characteristics

Boiling Point	86-88°C	Specific Gravity (H_2O = 1)	1.465@20/20 C
Vapor Pressure (mmHg)	57.8@20°C	Freezing/Melting Point	-86.4°C
		Volume % Volatile	100
Vapor Density (AIR = 1)	4.54	Evaporation Rate	0.28
Bulk Density	12.2lbs/gal@20°	(Butyl Acetate = 1)	

Solubility in Water	pH	6.7-7.5
0.11		

Appearance and Odor

Clear, colorless liquid with ether-like odor.

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
None (by DOT test method)		7.8%	52%

Extinguishing Media

Water, dry chemicals or carbon dioxide.

Special Fire Fighting Procedures

Fire fighters should wear NIOSH/MSHA approved pressure demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards

Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a high energy spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7.8%-52% by vol. Decomposition or burning can produce hydrogen chloride or possible traces of phosgene.

Section V - Reactivity Data

Stability			Conditions to Avoid	
	Unstable			Avoid open flames, hot glowing surfaces of electric arcs.
	Stable	X		

Incompatibility (Materials to Avoid)

Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive compounds may be formed.

Hazardous Decomposition or Byproducts

Hydrogen chloride and possible traces of phosgene.

Hazardous Polymerization	May Occur		Conditions to Avoid	None
	Will Not Occur	X		

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	Yes	Yes	Yes

Toxicity Data:		LC50 Inhalation:	LCLO (RATS) 8000 ppm/4 hour
		LD50 Dermal:	Not Determined
		Skin/Eye Irritant:	See Health Hazards below
		LD50 Ingestion:	(RAT) 4900-7000 MG/KG
Classification:	FISH, LC50 (Lethal Concentration):	Inhalation:	See Health Hazards below
		Skin:	
		Skin/Eye:	Slightly toxic
		Ingestion:	Not determined
		Aquatic:	skin-mildly irritating/eye-irritant Slightly to moderately toxic See Health Hazards below

Health Hazards (Acute and Chronic)

Permissible Exposure Limits: OSHA: 50 ppm, 8-hour TWA (Time Weighted Average); 200ppm, 15-minute STEL (Short-Term Exposure Limit); 20 CFR 1910.1000, Table Z.2, Rev. 3/1/89.
Acute: **Inhalation**: Trichloroethylene is a central nervous system depressant which can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, possible central nervous system damage, unconsciousness and death in confined or poorly ventilated areas. Fatalities following severe acute exposure have been attributed to ventricular fibrillation resulting in cardiac failures. **Eyes/Skin**: Liquid splashed in the eye can result in discomfort, pain and irritation. 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, and skin absorption can occur. **Ingestion**: Swallowing of this material may result in irritation of the mouth and GI tract along with other effects as listed above for inhalation. Vomiting and subsequent aspiration into the lungs may lead to chemical pneumonia and pulmonary edema which is a potentially fatal condition.
Chronic: Prolonged exposure above the OSHA permissible limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for chronic effects in animals. While there are studies in which tumors were induced in mice, there is no evidence that trichloroethylene poses a carcinogenic risk to humans. Trichloroethylene is listed in Group 3 by IARC and is not listed by NTP or OSHA.

Toxicity Data - Aquatic Data:
Sheepshead Minnows - 96-hour LC50 - 52 MG/L - Slightly Toxic
Mysid Shrimp - 96-hour LC50 - 14 MG/L - Slightly Toxic
Marine Alga - 96-hour EC50 - 95 MG/L - Slightly Toxic

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	No	2A - probable carcinogen	No

Signs and Symptoms of Exposure

See above “Health Hazards”.

Medical Conditions Generally Aggravated by Exposure

None known.

Emergency and First Aid Procedure

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician. **Eyes/Skin**: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes while removeing contaminated clothing and shoes. If irritation occurs, consult a physician. Thoroughly clean contaminated clothing and shoes before reuse or discard. **Ingestion**: If conscious: drink large quantities of water. Do not induce vomiting. Take immediately to a hospital or physician. If unconscious: or in convulsions, take immediately to a hospital. Do not attempt to give anything by mouth to an unconscious person.

Notes to physician (including antidotes): Only administer adrenaline after careful consideration following trichloroethylene exposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to trichloroethylene.

Section VII - Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled

Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection (see Section VIII) should be permitted in area. Dike area to contain spill. Take precaustions as necessary to prevent contamination of ground and surface waters. Recover spilled materials on absorbents, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including ingitable vapors, have been removed, thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth, gravel, etc. as necessary and place in closed containers for disposal.

Waste Disposal Method

Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous wste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with The Clean Air Act, The Clean Water Act, The Resource Conservation and Recovery Act, as well as any other relevent federal, state, or local laws/regulations regarding disposal.

Precautions to be Taken in Handling and Storage

•Do not use in poorly ventilated or confined spaces without proper respiratory protection (see section VII). •Trichloroethylene vapors are heavier than air and will collect in low areas. •Keep container closed when not in use. •Store only in closed, properly labeled containers. •Liquid oxygen or other strong oxidants may form explosive mistures with trichloroethylene. •This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene. •Avoid contamination of water supplies. Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected. •A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component. •Do not use cutting or welding torches on drums that contained trichloroethylene unless properly purged and cleaned.

Other Precautions

•Do not breathe vapors. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury and possible contral nervous system damage. •Use only with adequate ventilation. Ventilation must be sufficient to limit employee exposure to trichlor below permissible limits. Observance of lower limits is advisable (outlined in Section VI). Eye irritation, dizziness and/or drunkenness are signs of overexposure. •Avoid contact with eyes. Will cause irritation and pain. •Avoid prolonged or repeated contact with skin. May cause irritation or dermatitis. •Do not swallow. Swallowing may cause injury or death.

Section VIII - Control Measures

Respiratory Protection (Specify Type)

Use a half or full facepiece organic vapor chemical cartidge or canister respirator when concentrations exceed the permissible limits. Use self-contained breathing apparatus (SCBA) or full facepiece airline respirator with auxiliary SCBA operated in the pressure-demand mode for emergencies and for all work performed in storage vessels, poorly ventilated rooms, and other confined areas. Respirators must be approved by NIOSH/MSHA. The respirator use limitations made by NIOSH/MSHA and by the manufacturer must be observed. Respiratory protection programs must be in accordance with 20 CFR 1910.134.

Ventilation	Use local exhaust or dilution ventilation as appropriate to control exposures to below permissible limits.

Protective Gloves	Eye Protection
Viton(R), silver shield (R), polyvinyl alcohol (degrades in water).	Splashproof goggles.

Other Protective Clothing or Equipment

Boots, aprons, or chemical suits should be used when necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 and 29 CFR 1910.133.

Work/Hygienic Practices

Do not eat, drink or smoke in work areas.

COMMENTS:

TSCA-Trichloroethylene is on the TSCA inventory under CAS #79-01-6.

SARA TITLE III - A) 311/312 categories - Acute and Chronic, B) Listed in Section 313 under trichloroethylene, C) Not listed as an “extremely hazardous substance” in Section 302.

CERCLA - Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 100 pound. Releases to air, land or water which exceed the RQ must be reported to the national response center, 800-424-8802.

RCRA - Waste trichlor and contaminated soils/materials from spill cleanup and U228 hazardous waste as per 40 CFR 261.33 and must be disposed of accordingly under RCRA. See 40 CFR 261.33 (C) and 261.7 (B)(3) for cleaning requirements for empty containers.

California Prop. 65 - This product is a chemical known to the state of California to cause cancer.

New Jersey Right-To-Know - also contains butylene oxide (CAS No. 106-88-7).

Canadian WHMIS - A) Sensitization to product: None known, B) Reproductive toxicity: None known, C) Odor threshold: Not known, D) Product use: degreasing solvent, E) Requires poison symbol (Class D.1).

Revisions made TC 7/31/90, 11th Edition - Date, Edition, DOT Shipping Information updated, notes to physician updated.