

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917) December 1977

SECTION I

MANUFACTURER'S NAME PPG Industries, Inc.		EMERGENCY TELEPHONE NO. (412) 434-3131
ADDRESS (Number, Street, City, State, and ZIP Code) One Gateway Center Pittsburgh, PA 15222		
CHEMICAL NAME AND SYNONYMS Trichloroethylene, Ethylene Trichloride		TRADE NAME AND SYNONYMS Trichlor, Trichloroethylene
CHEMICAL FAMILY Halogenated Hydrocarbons	FORMULA CHCl=CCl ₂	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Unit)	ALLOYS AND METALLIC COATINGS	%	TLV (Unit)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Unit)
Stabilized trichloroethylene				100	100 ppm

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	188	SPECIFIC GRAVITY (H ₂ O=1)	1.465
VAPOR PRESSURE (mm Hg.) @20°C	57.8	PERCENT VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)	4.54	EVAPORATION RATE (Ethyl Ether=1)	0.28
SOLUBILITY IN WATER	0.11%	MOLECULAR WEIGHT	130
APPEARANCE AND ODOR Clear, colorless liquid with ether-like odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	See attached sheet	FLAMMABLE LIMITS	LM	UM
EXTINGUISHING MEDIA Water, dry chemical or CO ₂ (for fires involving trichlor)				
SPECIAL FIRE FIGHTING PROCEDURES Wear pressure-demand self-contained breathing apparatus for possible exposure to hydrogen chloride and phosgene.				
UNUSUAL FIRE AND EXPLOSION HAZARDS Vapors can be ignited by high intensity source of ignition can decompose or burn to form hydrogen chloride and traces of phosgene.				

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	See attached sheet.
EFFECTS OF OVEREXPOSURE	See attached sheet.
EMERGENCY AND FIRST AID PROCEDURES	See attached sheet.

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID Avoid open flames, hot glowing surfaces, electric arcs.
	STABLE	X	
INCOMPATIBILITY (Materials to avoid) Avoid contact with caustic soda or caustic potash; may react producing explosive mixtures.			
HAZARDOUS DECOMPOSITION PRODUCTS Hydrochloric acid and traces of phosgene.			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID None
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Immediately evacuate area and provide maximum ventilation. Only personnel equipped with proper respiratory and skin/eye protection should be allowed in area. Collect spilled material on sawdust or vermiculite and sweep into closed containers for disposal. then flush area with plenty of water and maintain ventilation until vapors are eliminated.	
WASTE DISPOSAL METHOD	
EPA-approved incineration or contact local waste disposal contractor.	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type) See attached sheet.		
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General) Sufficient to maintain workplace concentration below TLV.	OTHER
PROTECTIVE GLOVES Polyethylene, neoprene or polyvinyl alcohol		EYE PROTECTION
OTHER PROTECTIVE EQUIPMENT Safety shoes, eye-wash fountain		Splash-proof goggles used in accordance with 29 CFR 1910.133.

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	
See attached sheet.	
OTHER PRECAUTIONS	
See attached sheet.	

ADDENDUM TO MATERIAL SAFETY DATA SHEET

ON TRICHLOROETHYLENE (DECEMBER, 1977)

SECTION IV -- FIRE AND EXPLOSION HAZARD DATA

Flash Point - None when tested in accordance with standard accepted laboratory techniques; however, trichloroethylene vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high-intensity source of heat. This can occur at concentrations of approximately 14% by volume and above.

SECTION V -- HEALTH HAZARD DATA

Acute Toxicity Values - Oral LD₅₀ (rat): 4,900 - 7,000 mg/kg ^{(1), (2)}
Oral LD₀₁ (human): 857 mg/kg ⁽¹⁾
Inhalation LCL₀₁ (rat): 8000 ppm/4 hour ⁽¹⁾

Threshold Limit Value: Current OSHA permissible exposure limits (20 CFR 1910.1000) are 100 ppm (8-hour TWA); 100 - 200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200 - 300 ppm excursions allowed only for maximum of 5 minutes in any 2-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

Effects of Overexposure

Acute: Irritant and central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness, and even death in confined or poorly ventilated areas. Fatalities following severe acute exposure have been attributed to ventricular fibrillation resulting in cardiac failures ⁽³⁾.

Eye contact can result in irritation, pain and discomfort. Prolonged or repeated contact with the skin can cause irritation and dermatitis.

Chronic: May damage the liver and kidneys upon prolonged or repeated inhalation of vapor. Preliminary test results have shown trichloroethylene to cause cancer in experimental laboratory animals (mice) via chronic ingestion ⁽⁴⁾ of liquid and chronic inhalation of vapors at 600 ppm ⁽⁵⁾. Although no evidence presently exists showing trichloroethylene to cause cancer in rats or humans, it is strongly suggested that trichloroethylene users review their health programs, "tighten-up" their operations and institute good operating and housekeeping practices designed to limit employee exposure as much below current OSHA permissible exposure limits as practical.

Emergency and First Aid Procedures

Inhalation Overexposure: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Note to Physician: Avoid use of adrenalin in any case where a person has been overcome by trichlorethylene.

Eye Contact: Flush with plenty of water for at least fifteen minutes. If irritation occurs, consult a physician.

Skin Contact: Wash thoroughly with plenty of soap and water. If irritation occurs, consult a physician.

Swallowing: If conscious, drink a quart of water then induce vomiting by placing a finger far back in the throat. Call a physician. If vomiting cannot be induced, take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT induce vomiting or give anything by mouth.

SECTION VIII -- SPECIAL PROTECTION INFORMATION

Respiratory Protection -- NIOSH/MESA approved organic vapor respirator for concentrations below 1000 ppm. For 1000 ppm and above, use air-supplied respiratory protection. Consult 29 CFR 1910.134 for specific requirements.

SECTION IX -- SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing

- Do not use in poorly ventilated or confined spaces.
- Keep containers tightly closed when not in use.
- Do not store in unlabeled or mislabeled containers.
- Do not store degreaser clean-out sludge in tightly sealed containers.
- Sludge containing finely divided aluminum residues should be stored out-of-doors away from combustible materials.

Other Precautions

- Avoid prolonged or repeated breathing of vapor.
- Use only with ventilation sufficient to limit employee exposure as far below OSHA permissible exposure limit as practical.
- Avoid contact with eyes.
- Avoid prolonged or repeated contact with skin.
- Do not take internally.

REFERENCES

- (1) NIOSH Registry of Toxic Effects of Chemical Substances, 1975.
- (2) Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963.
- (3) Dangerous Properties of Industrial Materials, Fourth Edition, N. I. Sax, 1975.
- (4) National Cancer Institute Carcinogenesis Bioassay of Trichloroethylene, DHEW publication, No. 76-802, February, 1976.
- (5) Manufacturing Chemists Association Chronic Inhalation Study on Trichloroethylene; preliminary report, October, 1977.