

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)

October, 1978

SECTION I

MANUFACTURER'S NAME PPG Industries, Inc.		EMERGENCY TELEPHONE NO. (304) 843-1300
ADDRESS (Number, Street, City, State, and ZIP Code) One Gateway Center, Pittsburgh, PA 15222		
CHEMICAL NAME AND SYNONYMS Ethylene Chloride, 1,2 dichloroethane		TRADE NAME AND SYNONYMS Ethylene Dichloride
CHEMICAL FAMILY Chlorinated Hydrocarbons	FORMULA CH ₂ ClCH ₂ Cl	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
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 (Units)
Ethylene Dichloride				100	50ppm

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	181	SPECIFIC GRAVITY (H ₂ O=1) 20/20°C	1.255
VAPOR PRESSURE (mm Hg.) @25°C	87	PERCENT VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)	3.4	EVAPORATION RATE (ethyl ether=1)	< 1
SOLUBILITY IN WATER	0.81g/100ml		
APPEARANCE AND ODOR	Colorless liquid; sweet chloroform type odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	65°F (18.3°C) (open cup)	FLAMMABLE LIMITS	LFL 6.2%	UFL 15.9%
EXTINGUISHING MEDIA	Dry chemicals, foam or carbon dioxide extinguishers			
SPECIAL FIRE FIGHTING PROCEDURES	Water spray should be used to keep fire exposed containers cool.			
UNUSUAL FIRE AND EXPLOSION HAZARDS	Wear NIOSH/MSHA-approved, self-contained breathing apparatus. Fires will form toxic and corrosive fumes of hydrogen chloride and under some conditions may form trace quantities of phosgene. Reacts vigorously with oxidizing materials.			

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 flames, intense heat sources, electric arcs
	STABLE	X	
INCOMPATIBILITY (Materials to avoid) Reacts with oxidizing materials ⁵			
HAZARDOUS DECOMPOSITION PRODUCTS Decomposes upon contact with flame, hot surfaces or electric arc, emitting toxic fumes of hydrogen chloride and possible traces of phosgene			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	See attached sheet
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 limit employee exposure to EDC as far below recommended exposure limits as practical.	
PROTECTIVE GLOVES Polyethylene, Neoprene or polyvinyl alcohol.		EYE PROTECTION
		Splash proof chemical safety goggles
OTHER PROTECTIVE EQUIPMENT		
Eye-wash fountain, safety shoes		

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 ETHYLENE DICHLORIDE

(OCTOBER, 1978)

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value - 50 ppm (200 mg/m³) Ceiling--100 ppm Maximum
Peak--200 ppm (5 minutes in any three hours). OSHA 29 CFR 1910.10
Table Z-2, May 28, 1975.

The National Institute for Occupational Safety and Health suggests that no worker be exposed to ethylene dichloride in excess of 5 ppm (20 mg/cm³) as a time weighted average (TWA) for a 10-hour workday, 40-hour workweek or to peak concentrations above 15 ppm (60 mg/cm³) as determined by a 15-minute sample.

Toxicity Data

Acute Oral: LD₅₀ for rats = 680 mg/kg¹
2 oz. have been fatal in humans.²

Acute Dermal: LD₅₀ for rabbits = ~2.8g/kg¹

Acute Vapor Inhalation:¹ Maximum time - concentrations in air survival by rats for a single exposure were:

12 minutes @ 20,000 ppm
1 hour @ 3,000 ppm
7 hours @ 300 ppm

Effects of Overexposure

Acute

General: Ethylene dichloride can be taken into the body by ingestion, inhalation or skin absorption. By any of these means it can be highly toxic. Acute poisoning may cause headache, dizziness, feelings of drunkenness, loss of consciousness, internal bleeding and death. Repeated exposures can bring on nausea, vomiting, stomach pain, irritated mucous membranes, loss of appetite, liver and kidney failure and possible death. Numerous cases of ethylene dichloride poisoning, both fatal and nonfatal, have been documented by the National Institute for Occupational Safety and Health. When ethylene dichloride is ingested, the predominant characteristic is blood disorder, including clotting problems. With skin absorption or inhalation, the first effects are headache, weakness, eye irritation, cyanosis (blackening of skin) and nausea. Ethylene dichloride has been found in human milk and in the exhaled breath of nursing mothers who were exposed to the chemical.⁶

Inhalation: Vapor is barely detectable at 50 ppm in air, is definite but not unpleasant at 100 ppm and may produce burning of the eyes, tears and irritation to the throat.¹

Eye Contact: When splashed in eyes, local effects include pain, irritation and watering. No permanent injury if washed out promptly.¹

Skin Contact: Prolonged or repeated skin contact may result in local irritation and dermatitis, in addition to systemic effects from absorption, as outlined above.²

Chronic

The National Cancer Institute (NCI) recently reported the results of their carcinogenesis bioassay study of EDC in rats and mice by oral administration. Results indicated a statistically significant increase of cancer in the test animals, versus the controls.

Professor C. Maltoni, of Bologna, Italy has studied the chronic effects of EDC by inhalation in rats and mice over a 24-month period. Although this study has not yet been completed and audited, preliminary results recently issued by Professor Maltoni did not confirm NCI's findings.

The National Institute for Occupational Safety and Health (NIOSH) in their recent recommended standard for exposure to EDC submitted to OSHA, recommended that OSHA reduce the current permissible exposure limit of 50 ppm (8-hour TWA) to 5 ppm (8-hour TWA) with a ceiling of 15 ppm.

Although no evidence presently exists showing EDC to cause cancer in humans, it is strongly suggested the EDC users review their health programs, "tighten up" their operations and institute good operating and house-keeping practices designed to limit employee exposure as much below currently established exposure limits as practical.^{6,7}

Emergency and First Aid Procedures

- o Inhalation Overexposure: Remove patient to fresh air. Call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.
- o NOTE TO PHYSICIAN: Avoid use of adrenalin in any case where a person has been overcome by ethylene dichloride vapors.
- o Eye/Skin Contact: Immediately flush eyes and skin (soap and water for skin) for at least 15 minutes. If irritation occurs, consult a physician. Wash contaminated clothing before reuse.
- o Swallowing: If conscious, drink a quart of water. Then induce vomiting by placing finger far back in 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 VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Evacuate area and provide maximum ventilation and remove all sources of ignition. Only personnel with proper protective equipment permitted in area. Collect spilled material on sawdust or vermiculite, sweep up and hold in closed containers for disposal. Maintain ventilation until vapors are eliminated.

Care must be taken when disposing of chemical product containers to be certain that environmental contamination does not occur. Questions on environmental considerations should be referred to the appropriate state or federal agency.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection--NIOSH/MSHA-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 Storage

- Container and system must be electrically grounded before unloading.
- Do not use in poorly ventilated or confined areas.
- Ethylene Dichloride vapors are heavier than air and will collect in low areas.
- Keep container tightly closed when not in use.
- Avoid contact with flames, hot surfaces or electric arcs. May form toxic and corrosive fumes.
- Do not store in open, unlabeled or mislabeled containers.

Other Precautions

- Keep away from heat sparks or flame.
Ethylene dichloride vapors are flammable and may be explosive.
- Avoid prolonged or repeated breathing of vapor.
High vapor concentration can cause unconsciousness or death.
- Use with adequate ventilation.
Ventilation must be sufficient to limit employee exposure to ethylene dichloride in work area as far below recommended exposure limits as practical.
- Avoid contact with eyes.
May cause pain and irritation and watering.

- Avoid prolonged or repeated contact with skin.
May cause irritation and dermatitis.
- Do not take internally.
Swallowing may cause injury or death.

REFERENCES

1. Industrial Hygiene and Toxicology, Volume II, Second Rev. Edition, F. A. Patty, 1963, pp. 1280-4
2. Data Sheet 350, Ethylene Dichloride, Published by the National Safety Council
3. Dangerous Properties of Industrial Materials, Fourth Edition, Sax, 1975
4. PPG Product Bulletin 55A, Ethylene Dichloride, PPG Industries, May, 1970
5. Documentation of Threshold Limit Values, American Conference of Governmental Hygienists, Second Edition, 1974
6. National Cancer Institute Brief Released September 26, 1978
7. NIOSH, Criteria for a Recommended Standard, Occupational Exposure to Ethylene Dichloride, U.S. Department of HEW, March, 1976