

Material Safety Data Sheet: Ethylene Dichloride

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name

Ethylene Dichloride

Effective date

May 2010

Synonyms

1, 2-Dichloroethane,
sym-dichloroethane, glycol
dichloride, ethylene chloride, EDC

Chemical formula

C₂H₄Cl₂

CAS name & no.

1,2-Dichloroethane, 107-06-2

Manufacturer's name and address

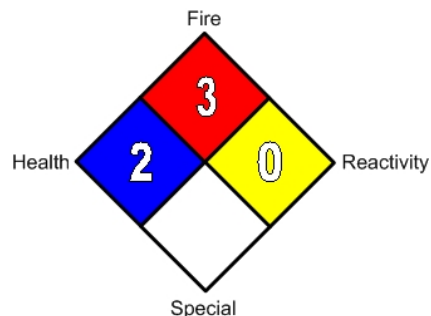
Georgia Gulf Chemicals and Vinyls, LLC
P.O. Box 629
Plaquemine, LA 70765

Emergency telephone number

For transportation emergencies:
CHEMTREC (800) 424-9300
For all other emergencies: (225) 685-2500

MSDS contact

Corporate Health & Safety Department
P.O. Box 629
Plaquemine, LA 70765
Phone Number (225) 685-2500



NFPA HAZARD RATING

Material Safety Data Sheet: Ethylene Dichloride**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS No.	Wt. %.
Ethylene Dichloride	107-06-2	> 99.8

3. HAZARDS IDENTIFICATION**PRECAUTIONARY INFORMATION**

Flammable. Eye, skin and throat irritant. High concentrations may cause central nervous system depression. Liquid contact with the eye may result in cornea injury. Liver and kidney damage.

POTENTIAL HEALTH EFFECTS**Primary Routes of Entry**

Inhalation, ingestion, skin, and eye contact.

Acute Effects

Ethylene dichloride vapor is irritating to the eyes, nose, and throat. Nausea, vomiting, and anorexia may occur at high exposures. Central nervous system symptoms occur at high exposures, including headache, light-headedness, mental confusion, dizziness, weakness, and blurred vision. Memory disorders, nervousness, insomnia, and tremors may also occur in severe poisonings. Liver, kidney, digestive system, and adrenal gland damage may develop several days after severe poisonings. Inhalation causes lung irritation and a burning sensation in the nose. Lung damage in severe poisonings may develop into pulmonary edema leading to a bluish discoloration (cyanosis) of the skin. This chemical is an eye and skin irritant, and contact with the liquid may cause severe injury (clouding) to the cornea of the eye.

Chronic Effects

Repeated exposures can cause liver, kidney, and adrenal injury. Central nervous system damage can also occur after prolonged exposure. Lung irritation and coughing may occur upon prolonged exposure. Pulmonary edema, rapid breathing, and cyanosis may occur at high levels of exposure over an extended period of time. Repeated skin contact should be avoided since the chemical is a defatting agent and can cause severe irritation and moderate edema.

Potential Adverse Chemical Interactions

Smokers exposed to this chemical may be more susceptible to emphysema. Excessive exposure may aggravate pre-existing liver and kidney disease.

Carcinogen Status

Component	List	Classification
1,2-Dichloroethane	NTP	Reasonably Anticipated Carcinogen
	IARC	Possible Carcinogen, 2B
	ACGIH	Not Classifiable, A4
	EPA	Probable Human Carcinogen, B2

Material Safety Data Sheet: Ethylene Dichloride**3. HAZARDS IDENTIFICATION (continued)**

IARC has determined that there is sufficient evidence of carcinogenicity of ethylene dichloride in both rats and mice following oral dosing (IARC, Vol. 20, 1979; NCI 55, 1978). Tumor sites in mice included the lungs (both sexes), the lymphatic system (males), and mammary glands and uterus (females). Tumor sites in rats included blood vessels (both sexes), stomach (males), and mammary glands (females). No data are available to evaluate the carcinogenicity of this chemical in humans, however, IARC states that it is reasonable for practical purposes to regard "1,2-dichloroethane as if it presents a carcinogenic risk" (IARC, Vol. 20, 1979). This chemical has been given a 2B IARC carcinogenicity rating (i.e., possibly carcinogenic to humans).

The EPA has determined that ethylene dichloride is a probable human carcinogen with sufficient evidence of carcinogenicity in animals but inadequate with regard to evidence in humans. Tumor sites in rats included blood vessels (both sexes), the stomach (males), and the mammary glands (females). Tumor sites in mice included the lung (both sexes) and liver (males). This chemical has been given a B2 carcinogenicity rating (IRIS, 1991).

NTP considers this chemical to be a reasonably anticipated human carcinogen. NIOSH considers this chemical to be a carcinogen (NIOSH, 1990). OSHA does not list this chemical as a carcinogen.

4. FIRST AID MEASURES**Inhalation**

If a person breathes large amounts of this chemical, move the exposed person to fresh air at once. Monitor for respiratory distress. Provide emergency airway support if needed and give 100% humidified supplemental oxygen with artificial respiration as needed. Keep individual at rest in semi-recumbent position. This may serve to forestall or minimize pulmonary edema. Get medical attention as soon as possible.

Skin Contact

If this chemical contacts the skin, promptly wash the contaminated skin with soap and water for at least 15 minutes. If this chemical penetrates the clothing, promptly remove the clothing and wash the skin with soap and water. Prolonged skin exposure from contact with soaked clothing produces severe irritation, moderate local edema, and necrosis of tissue. Systemic effects may ensue as the liquid is readily absorbed through the skin.

Eye Contact

If this chemical contacts the eyes, immediately wash the eyes with large amounts of room temperature water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. Irritation, lacrimation, pain, swelling, or photophobia may persist. A follow up examination should be performed by an ophthalmologist.

Ingestion

If this chemical has been swallowed, get medical attention immediately. **DO NOT INDUCE VOMITING.** Dilute immediately with 4 to 8 ounces of milk or water. Remove to emergency medical facility without delay. In all but the most minor of ingestion, gastric lavage should be performed but only by trained emergency medical personnel. Activated charcoal administered as a slurry has been shown to absorb ethylene dichloride. Seizures may occur and may be treated with intravenous diazepam. This procedure should be performed only by trained emergency medical personnel.

Material Safety Data Sheet: Ethylene Dichloride**5. FIRE FIGHTING MEASURES**

Flash Point 13° C (closed cup)

Flammable Limits (% By Vol.)

Lower Explosive Limit (LEL) 6.2
Upper Explosive Limit (UEL) 15.6

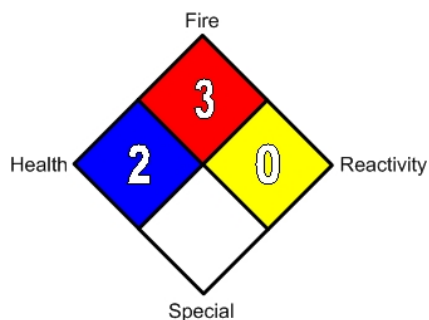
Autoignition Temperature 413°C

Fire Fighting Procedures/Fire Extinguishing Media

Keep unnecessary people away; isolate hazard area and deny entry. Avoid breathing vapors, stay upwind. Wear NIOSH approved self-contained respirator in the positive pressure mode and do not enter area without structural firefighters' protective equipment. Fight fire from protected location or maximum distance possible. Use halon replacement or carbon dioxide extinguishers, and water spray or alcohol foam for small fires. Large fires should be extinguished with alcohol foam. Water sprays may be used to keep containers exposed to fire cool but may not be sufficient to put out fire. Isolate for 1/2 mile in all directions if tank car or truck is involved in fire. For massive fires in cargo areas, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Unusual Fire and Explosion Hazards

Dangerous fire hazard and explosion hazard when exposed to heat or flame. Combustion of ethylene dichloride may depending on conditions, generate constituents that can be toxic at or above certain exposure thresholds. Such constituents may, depending on conditions, include phosgene and/or hydrogen chloride. Vapors of ethylene dichloride are heavier than air and may travel a considerable distance to a source of ignition and flash back.



NFPA HAZARD RATING

National Fire Protection Association Hazard Rating

- 4 = Extreme
- 3 = High
- 2 = Moderate
- 1 = Slight
- 0 = Insignificant

Note: NFPA Health Hazard Rating is a 2 and the rating does not consider carcinogenicity, but ethylene dichloride is classified by several organizations as a carcinogen. Please see Section 3, Carcinogen Status.

Material Safety Data Sheet: Ethylene Dichloride**6. ACCIDENTAL RELEASE MEASURES**

Shut off all sources of ignition. No smoking or flares allowed in the spill area. Restrict access to spill area, and move unprotected personnel upwind of the area. Keep out of low areas. Allow only trained personnel wearing self-contained breathing apparatus and appropriate protective clothing in the vicinity of the spill. Do not touch spilled material. Prevent entry into water bodies and sewers. For small spills take up with sand or other non-combustible absorbent material, and place into containers for later disposal. Control large spills by diking. Dispose all spill material in accordance with federal, state, and local regulations. Spills over the reportable quantity (100 lbs) should be reported to the National Response Center (800-424-8802).

7. HANDLING AND STORAGE

Store in a cool, dry place away from sources of ignition and in accordance with 29 CFR 1910.106. Store in an area equipped with automatic sprinklers or fire extinguishing system. All storage and transfer equipment must be electrically grounded and bonded to prevent possible ignition from static sparks. Do not use rubber or plastic hoses to transfer ethylene dichloride, unless approved for it. Ethylene dichloride is corrosive to aluminum, steel, and zinc and should not be stored in containers made out of these materials. Containers of this material may be hazardous when empty. Since emptied containers retain product residues, assume empty containers to have the same hazards as full ones. Follow all federal, state, and local regulations as well as insurance codes when storing and handling EDC.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Respiratory Protection**

Do not use air-purifying respirator. Use appropriate NIOSH approved supplied air or self-contained respirator in accordance with 29 CFR 1910.132 and 1910.134, to prevent overexposure. Respirators must be selected based on the airborne levels found in the workplace and must not exceed the working limits of the respirator.

Eye Protection

Use splash proof chemical safety goggles or appropriate full-face respirator. Follow the eye and face protection guidelines of 29 CFR 1910.132 and 1910.133. Where there is any possibility that an individual's eyes may be exposed to ethylene dichloride, an eye wash fountain (in accordance with 29 CFR 1910.151) should be within the immediate work area for emergency use.

Protective Gloves

Use protective gloves in accordance with 29 CFR 1910.132.

Ventilation

Provide local ventilation to maintain exposure levels below recommended exposure limits, and to prevent an explosive atmosphere from developing due to the accumulation in air of ethylene dichloride. Use explosion proof ventilation equipment. Local exhaust ventilation should comply with OSHA regulations and the American Conference of Governmental Industrial Hygienists, Industrial Ventilation - A Manual of Recommended Practice.

Material Safety Data Sheet: Ethylene Dichloride**8. EXPOSURE CONTROLS/PERSONAL PROTECTION
(continued)****Exposure Limits/Guidelines**

Component	OSHA-PEL	ACGIH-TLV
1,2-Dichloroethane	50 ppm, 8-hour TWA 100 ppm, Ceiling 200 ppm, Peak -5 minutes in any 3 hours	10 ppm, 8-hour TWA

PEL - Permissible Exposure Limit TWA = Time Weighted Average (8 hr.) TLV = Threshold Limit Value

Other

Where there is a possibility of exposure of an individual's body to ethylene dichloride, facilities for quick drenching of the body should be provided (in accordance with 29 CFR 1910.151) within the immediate work area for emergency use. Such individuals should be provided with and required to use impervious clothing in accordance with 29 CFR 1910.132.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless liquid
Odor	Chloroform-like odor
Molecular Weight	98.96
Boiling Point	83.5° C
Melting Point	-35.3° C
Solubility	Slightly soluble in water (0.8%), soluble in most solvents, miscible in alcohol, chloroform and ether
Specific Gravity (Water = 1.0)	1.25 at 20°C
Vapor Density (Air = 1.0)	3.4
Vapor Pressure	61 mm Hg at 20°C
pH	Not Available

The physical data above are typical values and should not be construed as a specification.

Material Safety Data Sheet: Ethylene Dichloride**10. STABILITY AND REACTIVITY****Stability**

Stable under normal conditions.

Polymerization

Hazardous polymerization does not occur.

Hazardous Decomposition Products

Ethylene dichloride decomposes in air to form hydrochloric acid. Combustion of ethylene dichloride may, depending on conditions, generate carbon dioxide, carbon monoxide, hydrogen chloride, and/or phosgene.

Incompatible Materials

Ethylene dichloride forms explosive hazards with metals and alloys, especially potassium, lithium, magnesium, and aluminum dusts. Mixtures of ethylene dichloride with nitric acid are easily detonated by heat, impact, or friction. Hazardous reactions may occur with nitrogen tetroxide and dimethylaminopropylamine. Avoid alkalis, oxidizing material, and amines.

11. TOXICOLOGICAL INFORMATION**Animal Toxicity**

Oral:	Rat LD ₅₀	680 mg/kg
	Mouse LD ₅₀	489 mg/kg
	Dog LD ₅₀	5700 mg/kg
	Human TD _{LO}	428 mg/kg
	Human LD _{LO}	286 mg/kg
Dermal:	Dog LD ₅₀	2,800 mg/kg
Inhalation:	Rat LC ₅₀	1000 ppm (7 hr)
	Monkey LD ₅₀	3000 ppm (7 hr)
	Human TC _{LO}	4000 ppm (1 hr)

TC_{LO} = Lowest air concentration that is toxic to a given species.

LC₅₀ = Air concentration that is lethal to 50% of a given species in a given period of time.

TD_{LO} = Lowest dosage that is toxic to a given species.

LD_{LO} = Lowest lethal dose in a given species by a given route of exposure.

LD₅₀ = Dose that is lethal to 50% of a given species by a given route of exposure.

12. ECOLOGICAL INFORMATION

Environmental Fate: The following information on ethylene dichloride is extracted from the TOXNET database maintained by the National Library of Medicine.

Atmosphere: If released to air, a vapor pressure of 78.9 mm Hg at 25 deg C indicates 1,2-dichloroethane will exist solely as a vapor in the ambient atmosphere. Vapor-phase 1,2-dichloroethane will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 63 days. Indirect evidence for photooxidation of 1,2-dichloroethane comes from the observation that monitoring levels are highest during the night and early morning.

Material Safety Data Sheet: Ethylene Dichloride**12. ECOLOGICAL INFORMATION (continued)**

Terrestrial: If released to soil, 1,2-dichloroethane is expected to have very high mobility based upon a Koc of 33. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 1.18×10^{-3} atm-cu m/mole. 1,2-Dichloroethane may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation in soil or water is not expected to be an important environmental fate process based upon a variety of biodegradation test data.

Aquatic: If released into water, 1,2-dichloroethane is not expected to adsorb to suspended solids and sediment based upon the Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 4 hrs and 4 days, respectively. A BCF of 2 suggests bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

Biodegradation: Aerobic: Biodegradability tests with 1,2-dichloroethane resulted in little or no biodegradation in aerobic systems using sewage seed or activated sludge. The one river die-away test reported no degradation. The percent BOD produced in 5-10 days was 0-7%. Another investigator reported slow to moderate biodegradation activity. In a bioreactor study using microbial consortia enriched from subsurface sediments contaminated with chlorinated hydrocarbons, a mixed-organic waste containing 21 ug/l of 1,2-dichloroethane was degraded to <5 ug/l after a 21 day run.

Anaerobic: No degradation of 1,2-dichloroethane occurred in an acclimated anaerobic system after 4 months incubation. The attenuation rate constant in a groundwater plume for 1,2-dichloroethane was 0.27/yr based on a study at the West KL Avenue Landfill, Kalamazoo, MI via the use of vertical profile sampling of monitoring wells on the site.

Ecotoxicity:

LC₅₀ Daphnia magna (water flea) 218,000 ug/l 48 hr. /Conditions of bioassay not specified

LC₅₀ Pimephales promelas (fathead minnow) 136 mg/l/96 hr (95% confidence limit: 129-144 mg/l), temp 25 deg C, dissolved oxygen 7.8 mg/l, water hardness 44.8 mg/l calcium carbonate (CaCO₃), alkalinity 41.4 mg/l CaCO₃, pH 7.41, static bioassay

LC₅₀ Lepomis macrochirus (bluegill) > 600 mg/l/24 hr, static bioassay, temp 21-23 deg C, pH 7.9-6.5

13. DISPOSAL CONSIDERATIONS

Waste Management Information: Do not dump into any sewers, on the ground, or into any body of water. Any disposal practice must be in compliance with local, state and federal laws and regulations (contact local or state environmental agency for specific rules). Waste characterization and compliance with applicable laws are the responsibility of the waste generator.

14. TRANSPORTATION INFORMATION

Proper shipping name	Ethylene Dichloride
DOT Hazard class	3, (Flammable liquid, poison)
DOT Shipping I.D. No.	UN 1184
Labeling	Flammable liquid, poison
PG	II
DOT Placard	Flammable

Material Safety Data Sheet: Ethylene Dichloride**15. REGULATORY INFORMATION**

Regulatory information is not meant to be all-inclusive. It is the user's responsibility to ensure compliance with federal, state or provincial and local laws.

SARA Title III**Section 302 and 304 of the Act; Extremely Hazardous Substances (40 CFR 355)**

<u>COMPONENT</u>	<u>CAS No.</u>	<u>TPQ (lbs)</u>	<u>RQ</u>
None	Applicable	Not Applicable	Not Applicable

NOTE: TPQ - Threshold Planning Quantity RQ - Reportable Quantity

Specific state and local requirements regarding reportable quantities should be reviewed prior to chemical use, as they may differ from the federal reportable quantity requirement as stated above.

Section 311 Hazard Categorization (40 CFR 370)

<u>ACUTE</u>	<u>CHRONIC</u>	<u>FIRE</u>	<u>PRESSURE</u>	<u>REACTIVE</u>
X	X	X		

Section 313 Toxic Chemicals (40 CFR 372.65)

<u>COMPONENT</u>	<u>CAS No.</u>	<u>WT. %</u>
ethylene dichloride	107-06-2	99.8%

CERCLA**Section 102(a) Hazardous Substances (40 CFR 302.4)**

<u>COMPONENT</u>	<u>CAS No.</u>	<u>WT. %</u>	<u>RQ (lbs)</u>
ethylene dichloride	107-06-2	99.8%	100

RCRA

40 CFR 261.21 Hazardous Waste Number:

Waste ethylene dichloride would be regulated as hazardous waste material with the hazardous waste number U077. Material contaminated with 0.5mg/L of EDC using the hazardous waste toxicity test would be regulated as hazardous waste material with the hazardous waste number D028.

TSCA

Ethylene dichloride is listed on the TSCA inventory.

CA Proposition 65

This product contains substances known to the State of California to cause cancer and/or reproductive toxicity.

Material Safety Data Sheet: Ethylene Dichloride**15. REGULATORY INFORMATION (continued)****Canadian Environmental Protection Act (CEPA)**

All substances in this product are listed on the Canadian Domestic Substances (DSL) list or are not required to be listed.

Canada Regulations (WHMIS)

This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33 and the MSDS contains all information required by this regulation. Class B2 – Flammable Liquid, Class D (2A) – Possible, probable or known human carcinogen according to classifications by IARC or ACGIH, Class D (2B) – Toxic Material.

16. OTHER INFORMATION

IMPORTANT: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable federal, state and local laws and regulations. **GEORGIA GULF CHEMICALS AND VINYLs, LLC MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, CONCERNING THE ACCURACY OR COMPLETENESS OF THE INFORMATION AND DATA HEREIN.** Georgia Gulf will not be liable for claims relating to any party's use of or reliance on information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading. This information relates to the material designated and may not be valid for such material used in combination with any other materials nor in any process.

MSDS Status: Revision Date 05/10/2010

Supersedes 6/10/2004