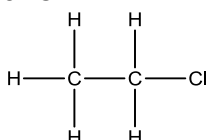


## ETHYL CHLORIDE

CAS Number: 75-00-3  
Synonyms: chloroethane, monochloroethane, EC  
Chemical Formula: C<sub>2</sub>H<sub>5</sub>Cl  
Molecular Weight: 64.52  
Chemical Structure:



Refer to the Safety Data Sheet (SDS) for additional information and before handling this material.

Description: Ethyl chloride is a colorless mobile liquid below 54°F (12°C), and above this boiling point, it is a colorless gas. It is a highly volatile, flammable, and has a sweet odor.

### Product Overview

Ethyl chloride is a versatile, organic compound used in a variety of applications. It is a flammable solvent with low toxicity and offers many advantages over other solvents. Axiall Corporation produces ethyl chloride at the Lake Charles, Louisiana plant. With over 60 years of responsible production and handling experience, Axiall manufactures ethyl chloride in a safe and environmentally sound manner. Axiall personnel are experienced in handling and shipping ethyl chloride, and our engineers, scientists, and sales personnel can provide technical assistance to users.

### Production

Axiall produces ethyl chloride by catalytic hydrochlorination of ethylene in liquid ethyl chloride, shown in the reaction below. The crude product is purified by distillation. Axiall's ethyl chloride is a technical grade product shipped by tank car and truck for use by industry. At room temperature, ethyl chloride is a gas, but it is easily compressed to the liquid state for shipping and handling.



### Uses

Ethyl chloride offers many physical and chemical properties that make it the right chlorinated solvent for many applications. It is low in toxicity, relatively inert, and inherently more stable than other chlorinated solvents. It serves as a base or intermediate in the production of various coatings, films, plastics, and gasoline additives. It is also used as a refrigerant, solvent, aerosol spray propellant, blowing agent in foam packaging, and in the production of dyes, pharmaceuticals, and other commercial chemicals. It can also be used as a topical anesthetic to numb skin prior to medical procedures such as skin biopsies and sports injuries. With all downstream applications, appropriate registrations and/or approvals may be required. Possible uses are described below:

- **Ethyl cellulose** - Ethyl chloride reacts with sodium cellulose to produce ethyl cellulose. Ethyl cellulose resins are widely used for coating, film forming, binding, and enhancing the performance of many different products ranging from industrial coatings to pharmaceuticals. This is the largest single industrial use of ethyl chloride in the US.

- **Styrene** - Styrene is made from ethyl benzene, which is generally produced by the Friedel-Crafts ethylation of benzene with ethyl chloride. Styrene is used primarily in polymeric production, especially in rubber, plastic, insulation, fiberglass, automobile and boat parts, and food containers.
- **Tetraethyl Lead** - A gasoline antiknock additive, tetraethyl lead is produced in the reaction of ethyl chloride with lead-sodium alloy. This is the largest single use of ethyl chloride outside of the United States; it is not produced in the United States due to governmental regulation.
- **Anesthetic** - The rapid cooling effect of ethyl chloride as it vaporizes makes it useful as a local anesthetic. Axiall does not supply U.S.P. grade ethyl chloride.
- **Chemical Production** - Ethyl chloride is used as a reactive intermediate in a variety of chemical reactions, including aluminum polymer catalysts and adhesives.

## Health Effects

Read and follow all instructions on the product label and review the Safety Data Sheet (SDS) to understand and avoid the hazards associated with ethyl chloride. Wear appropriate personal protective equipment and avoid direct contact. Eye or skin contact with ethyl chloride gas or liquefied gas will cause burns, severe injury and/or frostbite. Exposure through ingestion is not applicable because this product is a gas at normal temperature and pressure. Ethyl chloride is a simple asphyxiant; it may displace or reduce oxygen available for breathing especially in confined spaces and may affect the central nervous system; symptoms may include dizziness, drowsiness, lethargy, coma and death. Adrenaline should only be administered after careful consideration following overexposure to ethyl chloride; increased sensitivity of the heart to adrenaline may be caused by overexposure to this product.

The United States Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists® (ACGIH) have established or recommended occupational airborne exposure limits for ethyl chloride. The OSHA Permissible Exposure Limit (PEL) is an 8-hour time-weighted average (TWA) of 1000 ppm. The ACGIH Threshold Limit Value (TLV) is 100 ppm for an 8-hour TWA.

Depending on conditions, when ethyl chloride is exposed to high temperatures, heat, or ignition, hydrogen chloride gas, which is highly irritating to the nose and throat, as well as trace levels of phosgene gas, may be produced.

Before handling, it is important that engineering controls are operating and protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use and should be given the opportunity to review this document and the safety data sheet.

## Environmental Effects

Ethyl chloride should be kept out of lakes, streams, ponds, or other water sources. Ethyl chloride shows a low bioaccumulation potential.

## Exposure Potential

Precautions should be taken to minimize potential harm to people, animals, and the environment. Potential for exposure may vary depending upon site-specific conditions. When handling ethyl chloride, always refer to the Safety Data Sheet and Product Warning Label and follow all instructions and warnings. Based on the expected uses for ethyl chloride, exposure could be through:

- **Workplace exposure** - Exposure can occur either in an ethyl chloride manufacturing facility or in the various industrial facilities that use ethyl chloride. Ethyl chloride is handled in closed systems, so special

precautions are typically required for employees involved in maintenance activities, sample collection, or similar activities. Good industrial hygiene practices and the use of personal protective equipment will, when combined with proper training and environment, health and safety practices, contribute to a safe work environment.

- **Environmental releases** - If a release occurs, the area should be evacuated. Emergency personnel should wear protective equipment to minimize exposures during response operations. Many aspects of a spill control program are mandated by federal, state and local requirements. In addition, if a spill occurs, governmental reporting may be required. Refer to the Safety Data Sheet for instructions to contain and clean up a spill to minimize exposure.
- **Consumer exposure** - Ethyl chloride is not sold directly to consumers, however it is an ingredient in some consumer products. Keep all chemical products out of the reach of children.

## Safe Handling and Storage

Ethyl chloride is an extremely flammable liquid and gas under pressure. Ethyl chloride vapor concentrations between 3.8% and 15.4% by volume in air are explosive by ignition. Fire and explosion hazards can be minimized by adequate ventilation, using the proper types and arrangement of equipment, and reasonable precautions and care in handling.

Ethyl chloride should be stored away from direct sunlight in a dry, cool and well-ventilated area away from incompatible materials. It should not be stored above 35°C (95°F). Depending on conditions, when ethyl chloride is exposed to high temperatures, heat, or ignition, hydrogen chloride gas, which is highly irritating to the nose and throat, as well as trace levels of phosgene gas, an extremely poisonous gas, may be produced. As a result, all ignition sources should be eliminated. All metal parts of equipment must be grounded to avoid ignition of vapors by static electricity discharge.

Avoid contact with strong alkalis, such as caustic soda, strong acids, and oxidizing agents, as well as aluminum, copper, zinc, or their alloys. Contact of ethyl chloride with aluminum must be avoided because solvent decomposition can occur. This reaction can be particularly dangerous in pressurized enclosed systems of aluminum construction. It will generate heat, pressure, and corrosive gases which may rupture the equipment with explosive-like force.

Appropriate personal protective equipment, as described in the ethyl chloride Safety Data Sheet, should always be worn to avoid contact with the eyes, skin and clothing or to prevent the inhalation of the gas, fumes or vapor.

Above its boiling point of 12°C (53.6°F), ethyl chloride creates a pressure when confined. It is shipped and handled in pressurized containers. Small containers should not be exposed to the sun's direct rays or to heat sources. Stainless steel is the preferred construction material for storage vessels, but ordinary steel may be used so long as a tank does not contain water as a separate phase. Prolonged contact between ethyl chloride and copper, aluminum or zinc should be avoided.

## Packaging and Shipping

Axiall ships ethyl chloride in tank trucks, tank cars, and ocean tanker ships.

- **Tank cars** - Single compartment rail cars are available with nominal capacities of 10,000 and 20,000 gallons.
- **Tank trucks** - Axiall ships ethyl chloride in bulk tank trucks with a capacity of 3500-4500 gallons.
- **Ocean Tanker Ships** - Axiall is one of the few United States producers with the ability to load oceanic tanker ships. Customizable capacities are available.

## Fire and Explosion Hazards

Ethyl chloride is highly flammable. Since vapors are heavier than air, they will spread along the ground and may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

During a fire, promptly isolate the scene by removing all persons from the vicinity of the incident. No other action shall be taken without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

## Physical and Chemical Properties

Ethyl chloride is a chlorinated 2-carbon polar solvent. It is a suitable solvent for organic compounds that do not dissolve well in hydrocarbons, nonpolar solvents, and many organic materials. It is soluble in most organic solvents. Chlorinated hydrocarbons tend to decompose when exposed to light, heat, oxygen, or water. This decomposition process is accelerated by the presence of metals and metal salts, and the presence of the decomposed solvent itself tends to catalyze further decomposition.

At room temperature, the oxidation and hydrolysis of ethyl chloride takes place slowly. In the absence of air and water, it can be used with most common metals up to 200 °C (392 °F). Ethyl chloride burns with a green-edged flame, producing hydrogen chloride, carbon dioxide, and water. It is thermally stable to 400 °C (752 °F); thermal splitting yields ethylene and hydrogen chloride. The reactivity of ethyl chloride as an intermediate is often based on the affinity of alkali metal atoms for its chlorine atom.

Properties of Ethyl Chloride	
Boiling Point	53.6°F (12°C)
Freezing Point	-216.4°F (-138°C)
Auto-ignition temperature	966.2°F (519°C)
Flash Point, tag open cup	-45°F (-43°C)
Vapor Pressure at 0°C	464 mm Hg
Density at 20°C	7.461 lbs/gal

## Regulatory Information

The ethyl chloride Safety Data Sheet contains regulatory information, including Chemical Inventory Status, California Proposition 65 status, and Transportation Classifications. The following is additional regulatory information.

### North American Regulatory Information

- CONEG Regulation/Model Toxics in Packaging Legislation** - Lead, cadmium, mercury and hexavalent chromium are not intentionally added to ethyl chloride, and based on the formula and Axiall's experience with the product, the sum of the incidental concentration levels of these metals is not expected to exceed 100 parts per million (ppm) by weight.

- **RCRA** – Ethyl chloride, if discarded or spilled, as well as other wastes generated during use of ethyl chloride or containing ethyl chloride may exhibit one or more hazardous waste characteristics under 40 CFR 261.24, including D001 – ignitable. (Note: Axiall provides information on U.S. hazardous waste criteria for the product as manufactured. It remains the obligation of the user to evaluate their specific waste and to manage, treat, and dispose of unused material, residues, and containers in accordance with applicable federal, state, and local requirements.)
- **VOC Information** - Ethyl chloride contains volatile organic compounds (VOC) as defined in 40 CFR 51.100.
- **HAP Information** - Ethyl chloride is a hazardous air pollutant (HAP) as listed in the Clean Air Act Amendments of 1990, 42 USC 7412 (b).
- **Ozone-Depleting Chemicals** - Ethyl chloride is not/does not contain ozone depleting chemicals (40 CFR 82, Subpart A, Appendix F).
- **CERCLA Hazardous Substance** - Ethyl chloride (chloroethane) appears in the List of Hazardous Substances and Reportable Quantities table (40 CFR 302.4) with a reportable quantity (RQ) of 100 pounds (45.4 Kg).
- **Toxic Pollutants / Priority Pollutants** - Ethyl chloride contains toxic pollutants/priority pollutants as listed in 40 CFR 401.15.
- **TSCA Information** - Ethyl chloride is not currently subject to any rule or order under TSCA Sections 4,5,7,8(a), or 8(d).

## Other Regulatory Information

- **RoHS/WEEE** - Ethyl chloride has been reviewed with regard to the EU Directive 2011/65/EU “Restriction on the Use of Certain Hazardous Substances” (RoHS 2). Based on our knowledge of this product and information on the raw material suppliers’ Safety Data Sheets, this product does not contain cadmium, hexavalent chromium, lead, mercury, polybrominated biphenyls (PBBs) or polybrominated diphenyl ethers (PBDEs) at levels greater than the tolerated maximum concentration values established by the directive.

## Additional Product Information

- **Source** - Ethyl chloride is derived from mineral and petroleum sources and has not been derived from plant, animal, synthetic or fermentation sources.
- **Allergenic Materials** - Ethyl chloride is not manufactured using any of the following allergenic materials: carmine/cochineal extracts, celery, colors/color additives, dyes/food dyes, eggs/egg products, seafood/fish/shellfish/crustaceans, flavors, glutens, legumes, milk, mollusks, monosodium glutamate (MSG), mustards, plant nuts/seeds/oils (sesame, sunflower, safflower, canola, etc.), peanuts/peanut products, protein hydrolysates, soy/soybeans/soybean products, spices, sulfites, sulfates, tree nuts/tree nut oils and wheat.
- **Bovine Spongiform Encephalopathy** - Ethyl chloride is not of animal origin, and, to Axiall’s knowledge, does not contribute to Transmissible Spongiform Encephalopathy (TSE)/Bovine Spongiform Encephalopathy (BSE).
- **Genetically Modified Organisms (GMOs)** - Ethyl chloride is not manufactured with and does not contain genetically modified organisms.
- **Natural Latex Rubber** - Ethyl chloride is not manufactured with and does not contain natural latex rubber as defined in 21 CFR 801.437(b)(1).
- **Nutritional Value** - Ethyl chloride does not have nutritional value.

## Product Stewardship

Axiall Corporation is committed to managing ethyl chloride so that it can be safely used by its employees and customers. Axiall's relationships with its customers encourage communication about safety and environmental stewardship.

## Additional Information

For more information regarding Axiall's ethyl chloride, contact our customer service department by calling 800-243-6774.

## References

- Axiall Corporation Web page: <http://www.axiall.com/>
- Axiall Safety Data Sheets: <http://www.axiall.com/products/safety-data-sheets/>

## Notice

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with all federal, state, and local laws and regulations in connection with its use. Neither Axiall Corporation nor any of its affiliates shall be responsible for any damages of any kind whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers.

This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although Axiall Corporation believes this information is correct, Axiall Corporation makes no warranties as to its completeness or accuracy. Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the Axiall Corporation product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as safety data sheets (SDS) and product labels. A copy of Axiall's SDS for ethyl chloride can be obtained by going to the company's website [www.axiall.com](http://www.axiall.com).

This information is subject to change without notice.

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