

WLG-0043

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Manufacture's Name:	Address:	Telephone Number:
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Product Name: ETHYLENE
Date of Issue: March 8, 1999

SECTION I. PRODUCT IDENTIFICATION

Product Name: ETHYLENE
Common Names/Synonyms: Ethene, elayl, olefiant gas
CAS Number: 0074-85-1
Chemical Formula: C₂H₄

SECTION II. HAZARDOUS INGREDIENTS AND EXPOSURE LIMITS

Component	CAS No.	Percent	Exposure Limits
Ethylene	0074-85-1	100	(reference)

Exposure Limits

OSHA PEL: None established

ACGIH TLV: 1988-89 – None Established

NIOSH REL – None established

Toxicity Data – Mammal, inhalation, LC_{LO}: 950,000 ppm/5 min

See NIOSH, RTECS (KU5340000), for additional data.

SECTION III. CHEMICAL AND PHYSICAL PROPERTIES

Boiling Point:	(at 760 mm Hg) -155°F (-102.4°C)
Melting Point:	-272°F (-169°C)
Evaporation Rate (Butyl Acetate = 1):	Not applicable - gas
Vapor Density (Air = 1) :	0.978
Molecular Weight:	28 g/mol
Solubility in Water:	Ethy is soluble in water, alcohol, ether, acetone, and benzene

PRODUCT: ETHYLENE

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Appearance and Odor:

A colorless, extremely flammable gas with a sweet odor and taste.

Vapor Pressure:

40.5 atm at 68°F

Specific Gravity:

.57 at 155°F (-104°C)

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: -213°F (-136.11°C) (closed cup)

Auto Ignition Temperature: 1009°F(543°C)

Flammable Limits In Air: LFL: 3% UFL: 36%

National Fire Protection Association Hazard Identification Code

Health: 1 **Flammability:** 4 **Reactivity:** 2

Fire Extinguishing Media: Ethylene's extreme flammability, extensive explosibility range, and very low flash point represent dangerous fire and explosion risks. Treat any fire situation involving rapidly escaping and burning ethylene gas as an emergency. Ethylene fires can be extinguished by shutting off the source of the gas. (Fires should not be extinguished unless the flow of leaking material can be stopped.) Use water sprays to cool fire-exposed containers and to protect the personnel attempting to seal the source of the escaping gas.

Special Fire Fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

Unusual Fire Or Explosion Hazards: Ethylene gas is very flammable with an extensive explosibility range. Never extinguish the burning gas without first locating and sealing its source. Otherwise, the gas that continues to leak could explosively re-ignite without warning and cause more damage. Ethylene vapors may travel and be ignited by various ignition sources. Vapors may settle in low or confined areas, and flash back explosively.

SECTION V. HEALTH HAZARDS

Primary Routes of Entry: Inhalation

Acute Health Effects: At high concentrations, ethylene may act as an asphyxiate. The initial symptoms of simple asphyxiate gases effects are rapid respiration and air hunger, diminished mental alertness, and impaired muscular coordination. Continuing lack of oxygen causes faulty judgement depression of all sensations, rapid fatigue, emotional instability, nausea, vomiting, prostration, unconsciousness, and finally, convulsions, coma, and death.

Eyes/Skin: Skin contact with liquid or cold gas may cause frostbite. No evidence of harmful effects from skin absorption exist.

Inhalation: Although as a simple asphyxiate ethylene causes no significant physiological responses, it can displace the minimum required atmospheric oxygen level. Significant displacement results in an oxygen-deficient atmosphere with no adequate warning properties. Asphyxiation can occur especially in confined, poorly ventilated, undisturbed spaces infrequently entered by workers.

Ingestion: An unlikely route of exposure, material is a gas at normal temperature and pressure. Frostbite of the lips and mouth may result from contact with the liquid.

Chronic Health Effects: None reported

Medical Conditions Aggravated By Exposure: None reported

Carcinogenicity Status: Neither the NTP, IARC, nor OSHA lists ethylene as a carcinogen.

SECTION VI. FIRST AID PROCEDURES

Inhalation: Immediately remove victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Self-contained breathing equipment must be readily available for rescuers. Rescuers must use nonsparking tools and equipment; e.g., floodlights lowered into any incident area must be electrically grounded and bonded, shatter-resistant, and sparkproof.

Eyes: Immediately flush eyes with water and continue washing for at least 15 minutes. DO NOT remove contact lens, if worn. Get treatment from qualified medical personnel.

Skin: (liquid ethylene) Promptly flush the affected area with lots of tepid/lukewarm water to reduce freezing of tissues. Never apply direct heat to the frostbitten areas. Loosely apply dry, sterile, bulky dressings to protect the area from infection and further injury.

Ingestion: Unlikely route of entry, material is a gas at normal pressure and temperature.

Secure medical help for further treatment, observation, and support after first aid.

Physicians Note: Ethylene work processes (cutting, welding, soldering, etc.) may present different health hazards such as the generation of toxic carbon monoxide and metal oxide fumes.

SECTION VII. PERSONAL PROTECTION

Respiratory Protection: Wear a NIOSH-approved respirator if necessary. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA.

Skin: Wear gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact.

Eyes: Wear protective eyeglasses or chemical safety goggles, per OSHA eye and face protection regulations (29 CFR 1910.133). Where splashing is possible, wear a full face shield.

Ventilation: This product must be confined within sealed equipment. Provide general and local, explosion-proof ventilation systems to maintain airborne concentrations below the 3% v/v (Sec.4) Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by eliminating it at its source.

Contaminated Equipment: Caution should be exercised then wearing contact lenses in the work area. Soft lenses may absorb, and all lenses concentrate irritants. Launder contaminated clothing before wearing. Remove this material from shoes and equipment.

Other: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities, fire extinguishers, and oxygen bottles for emergency first aid. If appropriate, consider installing automatic sensing equipment that warns workers of oxygen-deficient atmospheres or preferably of potentially explosive air-gas mixtures. Design explosion-proof engineering systems for any area that stores, handles, or processes this gas so they have no spark potential or hot spots.

Comments: Regularly inspect and service piping systems which transport ethylene gas in production and storage areas.

SECTION VIII. REACTIVITY DATA

Stability: Ethylene is stable at room temperature during routine operations.

Hazardous Decomposition or By-Products: Thermal oxidative degradation of ethylene can produce carbon dioxide (CO²) and toxic carbon monoxide (CO).

Incompatible Materials: Ethylene can react violently with aluminum chloride, benzoyl peroxide and carbon tetrachloride, bromotrichloro methane, carbon tetrachloride, chlorine, chlorine dioxide, nitrogen dioxide, nitromethane and aluminum chloride, and ozone.

Incompatible Conditions: Never expose ethylene to ignition sources such as open flame, lighted cigarettes or pipes, uninsulated heating elements, or electrical or mechanical sparks. Prevent any accidental or uncontrollably rapid release of ethylene gas from purposely burn ethylene gas (welding, cutting, or soldering) involve intensely hot, sooty flames.

Hazardous Polymerization: Hazardous polymerization cannot occur.

SECTION IX. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill and Leak: Design and practice an ethylene spill control and countermeasure plan (SCCP). When a spill occurs, notify safety personnel, eliminate heat and ignition sources, evacuate unnecessary personnel, provide maximum explosion-proof ventilation, and implement the SCCP. Use only nonsparking tools and equipment. Locate and seal the source of the leaking gas. Use water sprays to protect the personnel attempting this shut off. Large releases of ethylene can result in explosions. If attempts to seal the leaking gas are unsuccessful, consider evacuating the area.

Waste Management: Remove leaking or defective cylinders to a safe, location. Let the ethylene gas discharge at a moderate rate. When it is empty, return the cylinder to the supplier properly tagged, labeled, or stenciled MT (empty) or defective.

Comments: Due to the processing, reformulation, etc. it is the responsibility of the user to determine the status of waste material. Dispose of according to federal, state and local regulations.

SECTION X. ADDITIONAL PRECAUTIONS

Storage: Store ethylene in closed, pressurized cylinders, tank cars, pipelines, or other containers in a cool, dry, well-ventilated, fireproof area away from hear and ignition sources and incompatible chemicals (Sec 5). Protect these containers from physical damage and heat. Shield them from direct sunlight.

Special Handling/Storage: Electronically ground and bond all containers, tanks, cylinders, tank cars, and pipelines used in shipping, receiving, or transferring operations. Never smoke in any work area where there exists the possibility of ethylene gas (fire hazard). Recommended storage containers include steel.

SECTION XI. TRANSPORTATION DATA

Department of Transportation: (49 CFR 182,101-2)
Proper Shipping Name: Flammable gas
Placards Hazard Class: 2.1 Flammable
Labels: Flammable gas
UN/NA ID. No.: UN1962

SECTION XII. OTHER REGULATORY DATA

This Material is Regulated Under:

Occupational Safety and Health Administration (OSHA): Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed.

OSHA 29 CFR 1910.119 Process Safety Management: Listed this material as flammable per 1910.1200

Resource Conservation and Recovery Act: (40 CFR 261.33) Not listed

40 CFR Part 68 (RMP): Listed

Superfund Amendments Reauthorization Act: Extremely Hazardous Substance (40 CFR 355): Not listed

Sara Toxic Chemical (40 CFR 372): Listed

Proposition 65: None

SECTION XIII. USERS RESPONSIBILITY

This bulletin cannot cover all possible situations that the user may experience during processing. Each aspect of the user's operation should be examined to determine, if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to employees and/or customers. Westlake Petrochemicals Corporation must rely on the user to use this information to develop appropriate work practice guideline and employee instructional programs specific to the user's operation.

SECTION XIV. DISCLAIMER OF RESPONSIBILITY

As the conditions and methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein based on credible published data and is believed to be true and accurate, but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information or the hazards connected with the use thereof. Compliance with all applicable federal, state and local laws and regulations regarding the use, storage, sale, transport or disposal of this material is the responsibility of the user.

ISSUED: BY WESTLAKE PETROCHEMICALS CORPORATION March 8, 1999.