



Permviro Systems, Inc.  
Trotter's Creek Industrial Park  
3520 Trotter Drive  
Alpharetta, GA 30004  
(770) 667-9800 • FAX (770) 667-9724

**MATERIAL SAFETY DATA SHEET**  
**APRIL 4, 2008**

**ETHYLENE (99.9% GRADE) – COLOR RIPE® (RIPENING AGENT)**

**A. PRODUCT INFORMATION:** Synonyms: Ethene, Etherin  
Chemical Name: Ethylene  
Chemical Family: Olefinic Hydrocarbon  
Chemical Formula: C<sub>2</sub>H<sub>4</sub>  
CAS REG. NO.: 74-85-1  
DOT IDENTIFICATION # - UN 1962  
DOT HAZARD CLASS: FLAMMABLE GAS

**B: HAZARDOUS COMPONENTS:**

INGREDIENTS:	CAS#	% BY WEIGHT	OSHA PEL	ACGIH TLV
Ethylene	74-85-1	99.95	NE	Simple Asphyxiant
Ethane	74-84-0	0.03	NE	Simple Asphyxiant
Methane	74-82-8	0.02	NE	Simple Asphyxiant

**C: PHYSICAL DATA:**

Appearance: Colorless Gas      Odor: Mild, sweet odor  
Solubility in water: Negligible      Viscosity: N/A  
Freezing point: -272.6°F (-169°C)      Boiling point: -154°F (-103.7°C)  
Liquid density at boiling point: 35.3 lb./ft.<sup>3</sup> (566 kg/m)<sup>3</sup>  
Vapor pressure at 70°F (21.1°C): above the critical temperature of 49.8°F (9.9°C); 1350 psia (69796 mm Hg) at 100°F  
Vapor density (Air = 1): 0.97  
Melting point: -272°F (-169°C)  
Specific gravity (water = 1): 0.610; at 70°F, 1 atm (air = 1): 0.97  
Percent volatile by volume: N/A  
Evaporation rate (Butyl Acetate = 1): N/A  
Octanol/Water partition coefficient: ND  
Odor threshold (ppm): ND

**\*FOR CHEMICAL EMERGENCY – SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT, CALL CHEMTREC AT 1-800-424- 9300 DAY OR NIGHT OR OUTSIDE THE CONTINENTAL USA CALL (202) – 483 – 7616 (COLLECT)**

**D. FIRE AND EXPLOSION DATA:**

**Flash point:** -213°F (-136°) (estimated)

**Autoignition temperature:** 914°F (490°C)

**Flammable limits (% by volume in air):** LEL – 2.7%; UEL – 36.0%

**Fire extinguishing media:** Dry chemical, foam, carbon dioxide, water spray

**Special Fire Fighting Procedures:** Shut off supply of gas. Evacuate area of all unnecessary personnel. Use NIOSH/MSHA-approved self-contained breathing apparatus and other protective equipment and/or breathing apparatus and other protective equipment and/or garments described in section C if conditions warrant. Allow fire to burn until gas flow is shut off, if possible. Water fog or spray may be used to cool exposed containers and equipment.

**Fire and explosion hazards:** Carbon oxides formed when burned. Flashback along vapor trail may occur. Explodes spontaneously when mixed with chlorine in sunlight.

**NFPA CLASSIFICATION**

0 = Least    1 = Slight    2 = Moderate    3 = High    4 = Extreme

**Health: 1          Fire: 4          Reactivity: 2**

**E. HEALTH HAZARD INFORMATION**

**Exposure limits/parameters:**

**Listed as simple asphyxiant by ACGIH Manufacturer recommendation**

**Routes of exposure and effects:**

- 1. Inhalation:** Excessive exposures may cause dizziness, loss of balance and coordination, unconsciousness, coma, death. Simple asphyxiant (excludes oxygen).
- 2. Skin:** Gas is not irritating to the skin. Liquified gas can cause freeze burns upon direct contact resulting in tissue necrosis.
- 3. Eye:** Gas is not irritating to the eye. Liquified gas can cause freeze burns upon direct contact resulting in tissue necrosis.

- 4) Ingestion: Not a likely route. Liquified gas may cause freeze burns to the mucous membranes and possible central nervous system depression.

**SUBCHRONIC AND CHRONIC EFFECTS OF OVEREXPOSURE:**

No known applicable information.

**OTHER HEALTH EFFECTS:**

Ethylene demonstrated no mutagenic properties in E. Coli and several Bacillus species. Ethylene gas was concluded to be nontoxic at concentrations as high as 3000 ppm for up to 2 years in rats.

**HEALTH HAZARD CATEGORIES:**

	Animal	Human
Known carcinogen	_____	_____
Suspect carcinogen	_____	_____
Mutagen	_____	_____
Teratogen	_____	_____
Allergic sensitizer	_____	_____
Highly toxic	_____	_____
Toxic	_____	_____
Corrosive	_____	_____
Irritant	_____	_____
Target organ toxin	_____	_____*

\*Specify – Eye and skin hazard – freeze burns; Lungs – simple asphyxiant

**RECOMMENDED FIRST AID TREATMENT**

**GENERAL:** Prompt medical attention is mandatory in all cases of overexposure to ethylene. Rescue personnel should be equipped with self-contained breathing apparatus and be cognizant of extreme fire and explosion hazard.

**EYE:** Immediately flush eyes with running water for at least 15 minutes. For freeze burns, seek immediate medical attention. If irritation develops, seek medical attention.

**SKIN:** Flush skin with water for 15 minutes. For freeze burns, seek immediate medical attention. If irritation develops, seek medical attention.

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**INHALATION:** Remove from exposure. If breathing ceases, administer artificial respiration followed by oxygen. Seek medical attention.

**INGESTION:** Seek immediate medical attention.

**F. PERSONAL PROTECTION INFORMATION:**

**VENTILATION:** Use adequate ventilation. Local exhaust ventilation recommended. Mechanical ventilation recommended. Explosion proof ventilation equipment required.

**RESPIRATORY PROTECTION:** Not generally required. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA-approved self-contained breathing apparatus (SCBA).

**EYE PROTECTION:** Use safety glasses with side shields.

**SKIN PROTECTION:** No special garments required. Avoid unnecessary skin contamination with material.

**G: REACTIVITY DATA:**

**STABILITY:** Stable under normal conditions. Unstable with heat and high pressure; may polymerize.

**CONDITIONS TO AVOID:** Cylinder temperatures should not exceed 130°F (54°C).

**INCOMPATIBILITY (MATERIALS TO AVOID):** Chlorine, nitrogen dioxide, aluminum chloride, carbon tetrachloride, no. 2....See NFPA manual.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon oxides and various hydrocarbons formed when burned.

**H: HANDLING AND STORAGE PRECAUTIONS:**

Keep away from heat, sparks and flame. Keep in well-ventilated space. Storage has temperature limits – See Stability. Consult NFPA and OSHA codes. Transfer operations must be electrically grounded and bonded to dissipate static buildup. Closed system required for handling. Protect cylinders from damage. Provide means of controlling leaks. Keep containers closed. Avoid inhalation and skin and eye contact. Wear protective equipment and/or garments described in Section F if exposure conditions warrant. Wash hands after handling.

Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1.

**I. SPECIAL HANDLING RECOMMENDATIONS:**

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (< 3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult Compressed Gas Association Pamphlets P-1.

**J. SPECIAL PACKING RECOMMENDATIONS:**

Ethylene is noncorrosive and may be used with any common structural material.

**K. OTHER RECOMMENDATIONS OR PRECAUTIONS:**

Earth-ground and bond on all lines and equipment associated with ethylene system. Electrical equipment should be non-sparking or explosion-proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of federal law (49CFR).

**L. SPILL, LEAK AND DISPOSAL PROCEDURES:**

Prevent ignition; stop leak; ventilate area. Use water spray to disperse vapors. Keep upwind of leak. Evacuate until gas has dispersed. Wear respiratory protection.

Waste Disposal: Follow federal, state and local regulations. RCRA hazardous waste. Contract to authorized disposal service.

**M. DOT TRANSPORTATION:**

**Shipping name:** Ethylene; Ethylene, compressed  
**Hazard class:** Flammable Gas  
**ID Number:** UN 1962  
**Marketing:** Ethylene/UN 1962  
**Label:** Flammable Gas  
**Placard:** Flammable Gas/1962  
**Hazardous substance/RQ:** N/A  
**Shipping Description:** Ethylene, Flammable gas, UN 1962  
**Packaging references:** 49 CFR 173.304 and 173.306

**N. RCRA CLASSIFICATION-UNADULTERATED PRODUCT AS A WASTE: Ignitable**

**O. PROTECTION REQUIRED FOR WORK ON CONTAMINATED EQUIPMENT:**

**Wear protective equipment and/or garments described in Section F if exposure conditions warrant. Contact immediate supervisor for specific instructions before work is initiated.**

**P. ADDITIONAL COMMENTS:**

**This product contains the following chemical or chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 (See Section B):**

**ETHYLENE**

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