



Material Safety Data Sheet

R1150 ETHYLENE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ETHYLENE
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Ethylene	74-85-1	100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: DANGER! Flammable high-pressure gas. May form explosive mixtures with air. May cause frostbite. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers. Odor: Sweet, musty.

THRESHOLD LIMIT VALUE: Simple asphyxiant (ACGIH, 2002)

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SKIN: May cause frostbite.

EYES: May cause frostbite.

INHALATION: Asphyxiation. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

INGESTION: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Ethylene is an asphyxiant. Lack of oxygen can kill.



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MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of ethylene suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD

EVALUATION: None known.

CARCINOGENICITY: Ethylene is not listed by NTP or OSHA. The IARC lists ethylene as Group 3, unclassified as to carcinogenicity to humans.

4. FIRST AID MEASURES

SKIN: Wash with plenty of soap and water. In case of frostbite, get immediate medical attention.

EYES: Immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Get medical attention immediately.

INGESTION: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

NOTE TO PHYSICIAN: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT METHOD:	-213°F (-136°C) TCC
AUTOIGNITION TEMPERATURE:	914°F (490°C)
UPPER FLAME LIMIT (volume % in air):	36%
LOWER FLAME LIMIT (volume % in air):	2.7%
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA: CO₂, dry chemicals, water spray, or fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Spontaneously explosive when combined with chlorine in sunlight. Forms explosive mixtures with air and oxidizing agents. Heat of fire can build pressure in cylinder and cause it to rupture. No part of a cylinder should be subjected to a temperature higher than 125°F (52°C). Ethylene cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.) If venting or leaking product catches fire, do not extinguish flames. Flammable gas may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.



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SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

DANGER ! Flammable high-pressure gas. Evacuate all personnel from danger area. Self-contained breathing apparatus may be required by rescue workers. Immediately spray cylinders with water from maximum distance until cool, taking care not to extinguish flames. Remove sources of ignition if without risk. Remove all cylinders from fire area if without risk; continue cooling water spray while moving cylinders. Do not extinguish any flames emitted from cylinders; stop flow of gas if without risk, or allow flames to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

HAZARDOUS COMBUSTION PRODUCTS: See Section 10.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

DANGER! Flammable high-pressure gas. Forms explosive mixtures with air. (See section 5.) Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Flammable vapors may spread from leak. Before entering area, especially confined areas, check atmosphere with an appropriate device.

WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. All piped Ethylene systems and associated equipment must be grounded. Electrical equipment must be non-sparking or explosion-proof. Leak-check system with soapy water; never use a flame. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap-openings; doing so may damage the valve and cause a leak. Use an adjacent strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier.

STORAGE RECOMMENDATIONS:

Store and use with adequate ventilation. Separate Ethylene cylinders from oxygen, chlorine, and other oxidizers by at least 20ft. (6.1 m) or use a barricade of noncombustible material. This barricade should be at least 5ft (1.53 m) high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods. For other precautions in using Ethylene, see section 16.



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For additional information on storage, handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to section 16 for the address and phone number along with a list of other available publications.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION / ENGINEERING CONTROLS:

LOCAL EXHAUST – An explosion-proof local exhaust system with sufficient airflow velocity is recommended.

MECHANICAL (general) – Under certain conditions, general exhaust ventilation may be acceptable to keep ethylene below the exposure limit.

SPECIAL – Use only in a closed system.

OTHER – None

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION: Wear work gloves when handling cylinders.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

RESPIRATORY PROTECTION: None required under normal use. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE, ODOR AND STATE:	Colorless gas at normal temperature and pressure; faint, sweet, musty odor.
MOLECULAR WEIGHT:	28.05
SPECIFIC GRAVITY (air=1) at 32°F (0°C) and 1 atm:	0.978
GAS DENSITY at 32°F (0°C) and 1 atm:	0.0787 lb/ft ³ (1.261 kg/m ³)
SOLUBILITY IN WATER, vol/vol at 32°F (0°C) and 1 atm:	0.26
BOILING POINT at 1 atm:	-154.62°F (-103.68°C)
MELTING POINT at 1 atm:	-272.9°F (-169.4°C)
% VOLATILES BY VOLUME:	100

10. STABILITY AND REACTIVITY

NORMALLY STABLE? The product is normally stable.

INCOMPATIBILITIES (materials to avoid): Heat (reacts explosively with chlorine in sunlight or UV light), oxidizing agents, halogens, acids, aluminum chloride, halocarbons.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition and burning of Ethylene in the presence of air or oxygen may produce CO/CO₂.

HAZARDOUS POLYMERIZATION: May occur.

CONDITIONS TO AVOID: Elevated temperature and pressure.



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11. TOXICOLOGICAL INFORMATION

Ethylene is a simple asphyxiant.

12. ECOLOGICAL INFORMATION

No adverse ecological effects expected. Ethylene does not contain any Class I or Class II ozone-depleting chemicals. Ethylene is not listed as a marine pollutant by DOT.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. TRANSPORT INFORMATION

DOT/IMO SHIPPING NAME: Ethylene, compressed
SHIPPING LABEL(s): FLAMMABLE GAS
PLACARD (when required): FLAMMABLE GAS
HAZARD CLASS: 2.1
IDENTIFICATION NUMBER: UN 1962
PRODUCT RQ: None

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (Environmental Protection Agency):

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302): **Reportable Quantity (RQ):** None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355): **Threshold Planning Quantity (TPQ):** None
EHS RQ: None

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SECTIONS 311/312: Require submission of MSDS' and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows: **IMMEDIATE :** Yes **PRESSURE:** Yes
DELAYED: No **REACTIVITY:** No
FIRE: Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.
Ethylene is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION:
Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.
Ethylene is listed as a regulated substance in quantities of 10,000 lb (4536 kg) or greater.

TSCA: TOXIC SUBSTANCES CONTROL ACT: This product is listed on the TSCA inventory.

OSHA (Occupational Safety and Health Administration):

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.
Ethylene is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable gas on site in one location in quantities of 10,000 lbs (4536 kg) or greater is covered under this regulation unless the gas is used as fuel.

STATE REGULATIONS:

CALIFORNIA: This product is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: This product is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320)

16. OTHER INFORMATION

Be sure to read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Flammable liquid and gas* under pressure. Use piping and equipment adequately designed to withstand pressures to be encountered. Use only in a closed system. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, sparks, and open flame. **May cause anesthetic effects.** Avoid breathing gas. **Gas can cause rapid suffocation due to oxygen deficiency.** Store and use with adequate ventilation at all times. Close cylinder valve after each use; keep closed even when empty. **Never place a compressed gas cylinder where it may become part of an electrical circuit.**

NOTE: Prior to using any plastics, confirm their compatibility with Ethylene.

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MIXTURES: When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:

HEALTH	=2
FLAMMABILITY	=4
INSTABILITY	=2
SPECIAL	=None

HMIS RATINGS:

HEALTH	=1
FLAMMABILITY	=4
PHYSICAL HAZARD	=2

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: CGA-350

PIN-INDEXED YOKE: CGA-900

ULTRA-HIGH-INTEGRITY CONNECTION: Not applicable

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 listed below.

Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703)788-2700, <http://www.cagnet.com/Publication.asp>.

AV-1	<i>Safe Handling and Storage of Compressed Gases</i>
P-1	<i>Safe Handling of Compressed Gases in Containers</i>
SB-2	<i>Oxygen-Deficient Atmospheres</i>
V-1	<i>Compressed Gas Cylinder Valve Inlet and Outlet Connections</i>
---	<i>Handbook of Compressed Gases, Fourth Edition</i>

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