



NATIONAL REFRIGERANTS, INC.

R-1150

Safety Data Sheet

R-1150 ETHYLENE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ETHYLENE
USE: Refrigerant Gas
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 TRANSPORTATION EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

EMERGENCY OVERVIEW:
Flammable gas. Liquid under high pressure

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Flammable Gas, Gas under pressure, Compressed Gas
SIGNAL WORD: DANGER
HAZARD STATEMENT(S): Extremely flammable gas, Contains gas under pressure, may explode if heated
SYMBOL(S): Flames, Gas Cylinder



PRECAUTIONARY STATEMENT(S):

Prevention: Keep away from heat, sparks, open flame, and hot surfaces. No Smoking

Response: Leaking gas fire: Do not extinguish unless leak can be stopped immediately. Eliminate all ignition sources if safe to do so.

Storage: Protect from sunlight, store in a well ventilated place

EMERGENCY OVERVIEW:

Flammable gas. Liquid under high pressure

POTENTIAL HEALTH EFFECTS

Effects of Overexposure:

Eye Contact

Eye contact with the rapidly evaporation liquid may cause frostbite.



Skin Contact

Skin contact with the rapidly evaporation liquid may cause frostbite. Frostbite effects are a change in color of the skin to gray or white, followed by blistering.

Inhalation

Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Inhalation of high vapor concentration may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting, leading to unconsciousness, cardiac irregularities, or death.

Ingestion

Not an expected route of exposure.

3. COMPOSITION / INFORMATION ON INGREDIENTS

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

COMMON NAME and SYNONYMS

R1150; Ethylene

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

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.

ADVICE TO PHYSICIAN: No specific treatment. Contact poison treatment specialist immediately if large amounts have been inhaled or ingested

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% |
| EXTINGUISHING MEDIA: | CO ₂ , dry chemicals, water spray, or fog. |

UNUSUAL FIRE 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 re-ignition 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.

FIRE FIGHTING 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.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES:

Evacuate all personnel from affected area. Keep personnel upwind. Shut off all sources or ignition. Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Shut off leak if there is no risk. Ventilate area, especially low places where heavy vapors may collect.
CERCLA Reportable Quantity = 5,000 lbs.

7. HANDLING AND STORAGE

NO NORMAL HANDLING: Use only in well ventilated areas. Ground all equipment and cylinders before use. Use explosion- proof electrical equipment rated Class 1, group D in Division 1 locations. In Division 2 locations, all spark-producing electrical equipment must be explosion-proof and rated Class 1, Group D. Valve protection caps must remain in place unless container is secured with valve outlet pipe to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve in the discharge line to prevent hazardous back flow into the cylinder. Close valve after each use and when empty. Protect cylinders from physical damage.

STORAGE RECOMMENDATIONS:

Store in a cool, dry, well ventilated area away from heavy traffic and emergency exits. Do not allow cylinder storage area temperatures to exceed 125 deg. F (52C). 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 from being stored for excessive periods of time.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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.

EXPOSURE GUIDELINES

(Exposure Limits)

INGREDIENT NAME

Ethylene

ACGIH TLV

None Found

OSHA PEL

None Found

OTHER LIMIT

None Found

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:

Colorless gas

PHYSICAL STATE:

Gas at normal temperature and pressure

ODOR:

Faint, sweet, musty odor

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)

VAPOR PRESSURE:

at 70°F (21.1°C) – above critical Temperature/Pressure

FLASH POINT:

-136°C / -213°F

EVAPORATION RATE:

Not available

FLAMMABILITY:

Extremely flammable in the presence of ignition sources and oxidizing materials.

27% / 36%

LEL/UEL:

PARTITION COEFFICIENT

n-OCTANOL/WATER:

Log Pow: 1.13

AUTO IGNITION TEMPERATURE:

450°C / 842°F

DECOMPOSITION TEMPERATURE:

Data not available

VISCOSITY:

Not applicable

VAPOR DENSITY (air=1.0):

1.0

% VOLATILES BY VOLUME:

100

DENSITY: 32°F (0°C) and 1 atm:

0.0787 lb/ft³ (1.261 kg/m³)

pH:

Not applicable

MELTING POINT at 1 atm:

-272.9°F (-169.4°C)

SPECIFIC GRAVITY (air=1) at 32°F (0°C) and 1 atm:

0.978

MOLECULAR FORMULA:

C₂H₄

MOLECULAR WEIGHT:

28.05

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Normally stable

REACTIVITY: Not reactive under normal conditions

INCOMPATIBILITY WITH OTHER MATERIALS:



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

CONDITIONS TO AVOID: Elevated temperature and pressure.

11. TOXICOLOGICAL INFORMATION

Ethylene is a simple asphyxiant.

Rat inhalation LC50 (4 hr.): 2050 gm/m³; 128,000 ppm

Mouse inhalation LC50 (2 hr.): 1750 gm/m³

In screening studies with experimental animals, exposure above 25,000 ppm followed by a large epinephrine challenge has induced serious cardiac irregularities. Preliminary screening tests indicated that 1-Chloro-1,1-difluoroethane may be weakly mutagenic. In vivo cytogenicity and dominant lethal assays for mutagenicity were negative. In a two year rat inhalation study, 1-Chloro-1,1-difluoroethane produced no chronic or carcinogenic effects at levels as high as 2% in air.

POTENTIAL HEALTH EFFECTS

Effects of Overexposure:

Eye Contact

Eye contact with the rapidly evaporation liquid may cause frostbite.

Skin Contact

Skin contact with the rapidly evaporation liquid may cause frostbite. Frostbite effects are a change in color of the skin to gray or white, followed by blistering.

Inhalation

Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Inhalation of high vapor concentration may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting, leading to unconsciousness, cardiac irregularities, or death.

Ingestion

Not an expected route of exposure.

12. ECOLOGICAL INFORMATION

DEGRADABILITY (BOD):

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

US DOT ID NUMBER: UN 1962
US DOT SHIPPING NAME: ETHYLENE, COMPRESSED
US DOT HAZARD CLASS: 2.1
US DOT PACKING GROUP: NA



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

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.*

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

DISCLAIMER:

National Refrigerants, Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof). NO WARRANTY OF FITNESS OR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other methods of use of the product and of the information referred to herein are beyond the control of National Refrigerants. National Refrigerants expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.