



SAFETY DATA SHEET

1. Identification of the Substance and Company

Envirosystems Ethylene Oxide Sterilant

Product No. PB013 and PB015

Use: Sterilant
SDS No. A500US

NFPA 704HAZARD RATING:

HEALTH: 4
FIRE: 4
REACTIVITY: 3

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2. Hazards Identification

Extremely flammable; Toxic (Acutely toxic by inhalation. May cause cancer. May cause inheritable genetic damage.); Irritant to eyes, respiratory system and skin.

3. Composition/Information on Ingredients

Hazardous Component(s)	% By Wt.	CAS No.	EU No.	Hazard Class	Hazard Code	Oral LD50	Inhalation LC50
Ethylene Oxide	60-100	75-21-8	200-849-9	Press. Gas Flam. Gas 1 Carc. 1B Muta. 1B Acute Tox. 3 Eye Irrit. 2 Skin Irrit. 2	220,350, 340,331, 319,335, 315	72 mg/kg (Male Rats)	800 ppm/4 hours

4. First Aid Measures

Eye Contact: Flush eyes immediately with water for at least 15 minutes. Get medical attention.

Skin Contact: Flush skin immediately with water for at least 15 minutes. Get medical attention.

Inhalation: Remove patient to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting. Get medical attention. Do not give anything by mouth to an unconscious person. If conscious, drink a large quantity of milk or water.

Note to physician: Persons exposed to ethylene oxide may develop severe and intractable vomiting, requiring the use of antiemetics given intravenously. Prolonged or high vapor concentration exposure may result in the development of pulmonary edema after a latent phase of several hours. Following skin contact, primary irritation and blister formation may be delayed

5. Fire-Fighting Measures

Conditions of Flammability/Flash Point/Auto-ignition Temperature: < -18C (Extremely flammable)

Method: Closed cup **Upper Flammable Limit:** ND **Lower Flammable Limit:** ND

Special Hazards: Explosive. Vapors can burn without the presence of air or oxidizing agents and is prone to static or other low energy ignition sources. **Explosibility Data:** ND

Extinguishing Media: Water spray, carbon dioxide, dry chemical, alcohol-type or universal-type foams.

Special Fire Fighting Procedures: Do not extinguish flames unless leak can be stopped. Evacuate all personnel from danger area. Let burn unless leak can be stopped immediately. May form explosive mixtures with air and oxidizing agents. Immediately cool containers with water spray from maximum distance taking care not to extinguish the flames. Vapors may travel or be moved by air currents. Remove ignition sources and all containers if without risk. If flames are accidentally extinguished, explosive re-ignition may occur.

Hazardous Combustion Products: Carbon monoxide and carbon dioxide

6. Accidental Release Measures

May form explosive mixtures with air. Immediately evacuate all personnel from danger area. Wear self-contained breathing apparatus operated in the pressure demand mode and protective clothing. Remove all sources of ignition without risk. Reduce vapors with fog or fine water spray. Ventilate area of leak or move leaking assembly to well-ventilated area. Flood spills with water spray. To handle leaking cartridges, wear butyl gloves, coveralls and positive self-contained breathing apparatus. Neither pure ethylene oxide nor its aqueous solutions should be discharged to streams or sewers. Flammable vapors may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device. Contingency planning is recommended for handling releases, spills and emergencies

7. Handling and Storage

7.1 Handling

For industrial use only. Read and observe all labeled use instructions. Do not puncture or incinerate cartridges. Compatibility with plastics should be confirmed prior to use. OSHA regulations are in force that limit personnel exposure to ethylene oxide. (29 CFR 1910.134 and 191.1047. Discharge of aqueous solutions of ethylene oxide must be regarded as constituting both personnel and flammability hazards. Extreme care is appropriate in avoiding contamination of ethylene oxide that could lead to runaway reactions. Use only in closed systems. Wash thoroughly after handling.

7.2 Storage

Store in a cool, dry, well-ventilated area in the upright position. Keep away from heat and ignition sources.

8. Exposure Control/Personal Protection

8.1 Occupational Exposure Limits

Ethylene oxide: OSHA PEL = 1 ppm; OSHA Excursion Limit = 5 ppm UK HSE EH40 STEL

8.2 Personal Protection

Respirator Protection: An appropriate respirator is required if exposure limits are exceeded.

Eye Protection: Chemical splash goggles.

Protective Gloves: Butyl rubber

Other Protective Clothing and Equipment: Butyl rubber apron.

Engineering Controls/Ventilation: General or Local exhaust sufficient to control any release in excess of the threshold limits.

9. Physical and Chemical Properties

Solubility in Water: Highly soluble

Specific Gravity: 0.87 g/mL

Physical State/Appearance/Odor: Colorless liquefied gas with mild odor.

Freezing Point: -112C

Odor Threshold, Vapor Pressure, Vapor Density, Evaporation Rate, Boiling Point and Freezing Point: ND

Coefficient of Water/Oil Distribution: ND

10. Stability and Reactivity

Stability: Unstable

Hazardous Polymerization: May occur if contaminated with aqueous alkalis, amines, mineral acids, metal chlorides or metal oxides.

Incompatible Materials: Strong oxidizing agents, silver, magnesium, mercury, alkalis, acids, alcohols, mercaptans, alkali metals, amines metal chlorides and metal oxides.

Conditions to Avoid/Conditions of Reactivity: Heat and ignition sources.

Hazardous Decomposition or Byproducts: Carbon monoxide and carbon dioxide

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11. Toxicological Information

11.1 Acute (Primary Routes of Exposure)

Inhalation of High Concentrations May be Fatal. Vapors cause irritation of the nose, throat and lungs.

Depending on the degree of exposure, there may be stinging sensation of the nose and throat, coughing, chest tightness, headache, nausea, vomiting, diarrhea, light headed feeling, weakness, drowsiness, cyanosis, loss of coordination, convulsions and coma. May cause lung injury and the delayed onset of pulmonary edema. Inhalation LC₅₀ 800 ppm/4 hours.

Skin Contact (Irritancy or Sensitization): Sustained contact with the skin is unlikely, but can cause headaches, dizziness, nausea and vomiting. Dilute solutions may penetrate skin, producing a chemical burn. With liquid solutions in water, there may occur a local erythema, edema, and formation of vesicles. There may be a latent period of several hours to the onset of these symptoms. Large volumes of ethylene oxide spilled onto the skin may produce frostbite-like effect.

Eye (Irritancy) Contact: Liquid is irritating and can cause corneal injury. High concentrations of vapor can cause severe irritation and injury to the eyes.

Ingestion: A highly unlikely route of exposure. Severe irritation and ulceration of the mouth and throat, abdominal pain, nausea, vomiting, collapse and coma can occur. Oral LD₅₀ = 72 mg/kg (Male Rats).

11.2 Long Term Exposure

Ethylene oxide is considered by OSHA, NTP and IARC as a potential human carcinogen and mutagen. This product contains a chemical known to the State of California to cause cancer and reproductive harm. Allergic dermatitis may occur in a small proportion of exposed workers. In various reports involving recurrent exposures to high concentrations of ethylene oxide vapor, peripheral neurotoxic effects, and, in some cases, indications of central nervous system toxicity were described. Long term exposure to excessive levels of ethylene oxide may present reproductive, mutagenic, genotoxic, neurologic and sensitization hazards.

Reproductive Toxicity/Teratogenicity/Mutagenicity/Toxicologically Synergistic Products: ND

12. Ecological Information

None available.

13. Disposal Considerations

Do not contaminate ponds, waterways or ditches with chemical or used containers. Aerate empty cartridges according to instructions in the equipment manual. After aeration, dispose of with normal non-incinerated waste. Damaged or Expired Cartridges: Cartridges with damage to cap, or other damage (i.e. dents, scratches, etc.) that renders the cartridges unusable or prone to leakage should not be used. These cartridges should be disposed of according to local hazardous material disposal regulations. Unused cartridges with passed expiration dates should also be disposed of according to local hazardous material disposal regulations. Do not return any damaged, expired or unused cartridges to STERIS or to the cartridge manufacturer.

14. Transport Information

Ground: US Only: UN 1040, Ethylene Oxide, 2.3 (2.1), Inhalation Hazard Zone D, DOT-SP11265 (DOT-SP11265 relieves STERIS from labeling the case as a Toxic for US domestic transport only.)

Ground: Other than US: UN1040, Ethylene Oxide, 2.3 (2.1), Toxic, Flammable Gas, PG: NA

Road/Rail: ADR/RID Class: UN 1040, Ethylene Oxide, 2.3 (2.1), Toxic, Flammable Gas, Class 2, Classification Code 2TF, Hazard Identification No. 263

Sea: IMDG Class: UN1040, Ethylene Oxide, 2.3 (2.1), Toxic, Flammable Gas, (Marine Pollutant: No)

Air: Forbidden for air transport

15. Regulatory Information

EU Regulations: This preparation is classified as dangerous as defined by the UK Chemicals (Hazard Information and Packaging for Supply) Regulations. These regulations implement a number of EC Directives including the Dangerous Substances Directive (67/548/EEC and amendments), the Dangerous Preparations Directive (1999/45/EEC and amendments) and the Safety Data Sheets Directive (91/155/EEC and amendment).

Hazard Codes: H220 Extremely Flammable Gas, H350 May Cause Cancer, H340 May Cause Genetic Defects, H331 Toxic if Inhaled, H319 Causes Serious Eye Irritation, H335 May Cause Respiratory Irritation, H315 Causes Skin Irritation.

Safety Phrases: S3/7/9: Keep container tightly closed in a cool, well-ventilated place. S24/25: Avoid contact with skin and eyes. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39: Wear suitable protective clothing, gloves and full eye/face protection. S38: In case of insufficient ventilation wear suitable respiratory equipment. S45: In case of accident or if you feel unwell, seek medical advice immediately (show label where possible). S53: Avoid exposure – Obtain special instructions before use.

WHMIS Classification: Class B, D1 (Highly Flammable and Toxic)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulation.

16. Other Information

The information on this sheet is not a specification and does not guarantee specific properties. The information is intended to provide general knowledge as to health and safety based upon our knowledge of the handling, storage and use of the product. It is not applicable to unusual or non-standard uses of the product or where instruction or recommendations are not followed.

NA - Not Applicable

ND - No Data