

MATERIAL SAFETY DATA SHEET**1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND COMPANY**

Name of the product: Ethylene oxide

Supplier: Biolene SRL
Constitución 2610
C1254AAR - Buenos Aires - Argentina
info@biolene.com.ar www.biolene.com

Emergency Telephone number:
(+54) 11 4308 4963 / 4308 5652 / 4941 8165

2. COMPOSITION/INFORMATION ON INGREDIENTS. CHEMICAL IDENTITY.

Name of the product: Ethylene oxide
Trade name: Ethylene oxide - EO - ETO - OE - Oxirane
Formula: C_2H_4O
International nomenclature: EINECS nr: 200-849-9
CAS-Nr. 75-21-8
UN 1040

3. HAZARDS IDENTIFICATION**Over exposure effects (acute)**

On Ingestion: A highly unlikely route of exposure. May cause severe irritation and burns to the mouth, throat, abdominal pain, nausea, vomiting, collapse and coma.

If Inhaled: It may be lethal at high concentrations. Irritating to respiratory system. Depending on the level of exposure, it may cause: irritates nose and throat, cough, chest pain, headache, nausea, vomiting, diarrhea, sleepiness, coordination loss, convulsion and coma. May cause lung disease (delayed pulmonary edemas).

On Skin contact: A constant exposure of the skin is not likely to occur. It may cause: headache, dizziness, nausea and vomiting. Diluted Solutions may penetrate the skin and produce chemical burns.

A contact with the liquid o aqueous solutions may cause edema and blistering. At high EO concentration, it may cause frost on the skin.

On contact with eyes: In liquid state the gas is irritating to eyes. It may damage the cornea. Vapour concentrations may cause moderate irritation.

Effects of overexposure (chronic)

It may cause allergic contact dermatitis in a small proportion of workers exposed. Peripheral neurotoxic effects (central nervous system toxic effects) were detected after various periodical exposures at high EO concentrations. Women exposed to high EO concentrations may experience a tendency to have spontaneous abortions. Generally, an increase in malformation of chromosome is observed. OSHA establishes that the EO should be considered as a potentially carcinogenic chemical.

Medical Conditions Generally Aggravated by over exposure

Available information on toxicity and the chemical and physical properties of the material suggest that over exposure is not likely to have an effect on the existing medical conditions.

4. EMERGENCY AND FIRST AID PROCEDURES

General advice: Immediately remove contaminated clothing. Source of ignition should be kept clear. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration, if necessary. First aiders should pay attention to their own safety.

If inhaled: Administer dexamethasone aerosol without delay. Keep patient calm, remove to fresh air, summon physician. Apply artificial respiration, if necessary.

On skin contact: Immediately wash thoroughly with soap and water, summon physician.

On contact with eyes: In case of contact with the eyes rinse for 15 minutes with plenty of water and eyelids wide open. Obtain medical attention, preferably eye specialist.

On ingestion: Rinse mouth immediately and then drink plenty of water (at least two glasses), induce vomiting with your fingers, obtain medical attention immediately.

Note to physician: Treat symptomatically (decontamination, vital functions), A specific remedy is not known.

5. FIRE AND EXPLOSION HAZARD DATA

En case of fire:
Special fire fighting procedure: Copious amounts of water use dry extinguishing media, foam, carbon dioxide (CO2). Evacuate workers from danger area.

Protective clothing: In case of fire, wear self-contained breathing apparatus.

Further Information: Contaminated extinguishing water must be disposed of in accordance with local regulations.

Steps to be taken in case material is released or spilled:
Evacuate workers from danger area. Sources of ignition should be removed, if you are not at risk. Control vapours with water spray, if you are not at risk. Repair the leakage problem, if you are not at risk. Ensure ventilation of areas or take containers to a ventilated place. Make sure that the spillage or the aqueous substance does not reach drains. Waste should no be disposed of in rivers or streams. Contaminated product must be disposed of in accordance with local, provincial and/or national regulations.

6. PROCEDURES FOR ACCIDENTAL SPILLS

PRECAUTIONS: Treat any ethylene oxide leak as an emergency. All cleanup personnel must wear full protective equipment. Evacuate all personnel from the area except those directly engaged in stopping the leak or in cleaning up.

SPILLS CLEAN UP: Eliminate all ignition sources if this can be done safely. Ethylene oxide/air mixtures ignite readily and may detonate. Use water fog or spray to disperse vapors. Flood Spill with water spray to dilute and render non-flammable.

ENVIRONMENTAL: Dike runoff water, if possible, to prevent contaminated water from entering sewers, ditches, streams and ponds. It is mandatory to call the National Response Center (0800-424-8802) if 10 pounds (4.54 kg) or more is spilled or released to the environment.

7. HANDLING AND STORAGE

Handling: Ensure thorough ventilation of stores and work areas. Handle / store under dry nitrogen.

Special protective equipment: Sources of ignition should be kept clear. Take precautionary measures against static discharges.

Storage: Keep tightly closed in a dry and cool place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

OSHA (Occupational Safety and Health Administration (USA) values	
1 ppm (part per million) =	TWA= (Time-weighted average value) (8 hs./day - 40 hs./week)
5 ppm =	STEL = (short term exposure limit value) (15 min)
Respiratory Protection:	Respiratory mask or auxiliary positive-pressure equipment and full facepiece mask for concentrations higher than 200 ppm. For lower concentrations a dust mask can be used with appropriate filter for organic vapours or combined filters.
Hand protection:	Protective gloves of acrylonitrile.
Eye protection:	Tight-fitting goggles.
Body protection:	Protective clothing.
General safety and hygiene measure:	The usual precautions for handling of chemicals must be observed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Liquefied gas.
Colour:	Colourless
Odour:	Slightly etheric.
Change of physical state:	
Boiling point:	aprox. 10.7 °C
Melting point:	aprox. -112°C
Flash point:	aprox. -57°C
Flammability:	Highly flammable
Explosion limits:	
Lower	2.7 Vol.%
Upper	100 Vol.%
Ignition temperature:	> 200 °C (DIN 51794)
Vapour pressure (20 ° C)	1440 mbar
Density (20 ° C)	aprox. 0.88 g/cm ³ (DIN 51757)
Volume density:	n.a.
Solubility:	Soluble in water, alcohol and ether.
PH value:	Neutral
Viscosity (0° C)	aprox. 0.32 mPa.s

10. STABILITY AND REACTIVITY

Stability:	Stable.
Conditions to avoid:	EO rapidly breaks down at temperatures higher than 560 °C at atmospheric pressure. Depending on the atmospheric conditions the mentioned temperature value may vary. Sources of ignition should be kept clear. Hydrolysis product <12.5 °C, in soluble water.
Substances to avoid:	Reactions with acids, alkalis, strong oxidizing agents, inorganic metal salts.
Hazardous reactions:	Highly flammable.
Hazardous decomposition:	Thermic decomposition may produce CO and CO2.
Polymerization:	May occur. The EO polimerizes violently in contact with base solutions: amine, mineral acids. It will not polimerize under normal conditions of temperature and pressure.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	
LD50/oral/rat:	72-330 mg/kg
LC50/inhal/rat:	2.92 mg/l / ¼ h
Sensibility:	In aqueous solution: Risk of skin sensibility for repetitive contacts.

12. ECOLOGICAL INFORMATION

Elimination information: The EO permits hydrolysis, readily biodegradable. The EO reacts with water, turning into ethylenglycol. The product must be disposed of in accordance with local regulation. Do not incinerate EO containers.

Behaviour and environmental fate: Inhibition of degradation activity in activated sludge is not anticipated during the correct introduction of low concentrations.

Ecotoxic effects:

Toxicity to bacteria: EC/LC10 (17h): 10-100 mg/l, DIN 38412 Part 8
Toxicity to fish: EC/LC50 (24h): 10-100 mg/l, Louciscus idus

13. DISPOSAL CONSIDERATION

WASTE MANAGEMENT/DISPOSAL: When disposed, ethylene oxide is a RCRA hazardous waste with waste Code U115 (Commercial chemical product – listed for toxicity and ignitability). Waste ethylene oxide may be incinerated in an approved hazardous waste incinerator or can be biologically treated in an approved facility. **DO NOT INCINERATE ANY ETHYLENE OXIDE CONTAINERS.** Ethylene oxide is banned from land disposal. Dispose of waste materials in accordance with all applicable Federal, State and local laws and regulations.

14. TRANSPORT INFORMATION

Land Transport
UN 1040 Class 2
ADR/ RID Hazard Nr: 236
Decree Nr 779 /95 Resolution 195/97 Transit Law Nr 24.449 Annex S
Proper technical name: Pure ethylene oxide
Label: Poisonous gas, flammable

Sea Transport:
Class: 2.3
UN 1040 IMCO N° 2 Page Nr 2060
Maritime regulation Nr 3/96 Argentine Maritime authority
Marine pollutant: No
Proper technical name: Ethylene oxide
Label: Poisonous gas, flammable

Air Transport
IATA / OACI
UN: 1040 Class: 2.3
Packaging Instruction Nr 200
Proper technical name: Ethylene oxide

15. REGULATORY INFORMATION

Danger symbols
F+ Highly flammable
T Toxic

Risk phrases
R45 May cause cancer.
R46 May cause heritable genetic damage.
R12 Extremely flammable.
R23 Toxic by inhalation.
R 36/7/8 Irritating to eyes, skin and respiratory system. Moderate risk of water contamination.

Safety phrases
S53 Avoid exposure, obtain special instruction before use.
S3/7/9 Keep in a container tightly closed in a well-ventilated and cool place.
S16 Keep away from ignition sources – Do not smoke
S33 Take precautionary measures against static discharges
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)

16. OTHER INFORMATION

The information contained herein is based on the present state of knowledge and does not therefore guarantee certain properties.

Users of the product are required to do a thorough reading of this information.

Workers, agents and contractors should be noticed about the information contained in this paper as well as any other related information in order to promote a safe and responsible use of the product, and these persons should pass this information onto their customers as well.

The information provided in this data sheet is intended for qualified technical personnel who must make use of it under their responsibility, sole discretion and at their own risk. Biolene has no control over the use and handling of the product therefore, Biolene does not take responsibility for any kind of accident caused by an improper use of the product.