

MATERIAL SAFETY DATA SHEET

ETHYLENE OXIDE

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1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY

Product name	Ethylene Oxide
Chemical formula	C ₂ H ₄ O
Uses	Medical sterilization; chemical intermediate.
Synonyms	Oxirane; 1,2-Epoxy ethane
Manufacturer	Supplier
STEREO SDN BHD	STEREO PTY LTD
9 Jalan 5, Off Lorong Sungai Puloh	7 Tower Street
41400 Klang, Malaysia	Manly NSW 2095 Australia
T: +60 3 3290 2263 / F: +60 3 3290 2016 / stereo@stereocorp.com	

In EMERGENCY dial **000 POLICE or FIRE BRIGADE - Specialist advice: Carechem24 +61 2 8014 4558**

2. COMPOSITION / INFORMATION ON INGREDIENTS

Substance/Preparation	Substance.
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Number	75-21-8
EC Number (from EINECS)	200-849-9

3. HAZARDS IDENTIFICATION

Hazards identification	Liquefied gas. Extremely flammable. Toxic by inhalation. Irritating to eyes, respiratory system and skin. May cause cancer by inhalation. May cause heritable genetic damage.
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4. FIRST AID MEASURES

General Information	DO NOT attempt to rescue the victim unless proper respiratory protection is worn. Take appropriate steps to avoid fire, explosion and inhalation hazards. Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.
Inhalation	Toxic by inhalation. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

Skin/eye contact	Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Remove contaminated clothing. Obtain medical assistance. Immediately flush eyes thoroughly with water for at least 15 minutes. May cause chemical burns to skin and cornea (with temporary disturbance to vision).
Ingestion	Ingestion is not considered a potential route of exposure.

5. FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
Hazard combustion products	Incomplete combustion may form carbon monoxide.
Suitable extinguishing media	All known extinguishants can be used
Specific methods	If possible, stop flow of product. Continue water spray from protected position until container stays cool. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Protective equipment	Use self-contained breathing apparatus. Use chemically protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Use self-contained breathing apparatus and chemically protective clothing. Eliminate ignition sources. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Clean up methods	Reduce vapour with fog or fine water spray. Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost). Hose down area with water. Wash contaminated equipment or sites of leaks with copious quantities of water.

7. HANDLING AND STORAGE

Storage	Segregate from oxidant gases and other oxidants in store Store containers tightly closed and dry: - in a cool, well-ventilated area - away from direct sunlight - away from any source of ignition (including static discharge).
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Handling : Ensure equipment is adequately earthed.
 Suck back of water into the container must be prevented.
 Purge air from system before introducing gas.
 Do not allow backfeed into the container.
 Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures Provide adequate general and local exhaust ventilation to maintain concentrations below exposure and flammable limits.

Personal protective equipment Respiratory protection:
 In case of leakage, use self-contained breathing apparatus.
 Hand protection :
 Impervious gloves.
 Eye protection :
 Safety glasses. A safety shower and eyewash station should be readily available.
 Skin and body protection:
 Coveralls, boots, and/or other resistant protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state at 20 °C	Liquefied gas.
Colour	Colourless.
Odour	Ethereal. Poor warning properties at low concentrations.
Molecular weight	44
Melting point	-112 °C
Boiling point	10.4 °C
Critical temperature	196 °C
Vapour pressure, 20°C	1.4 bar
Relative density, gas	1.5 (air=1)
Relative density, liquid	0.89 (water=1)
Solubility in water	Completely miscible.
Flammability range	3 to 100 (vol% in air)
Auto-ignition temperature	440 °C
Other data	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10. STABILITY AND REACTIVITY

Stability Can form explosive mixture with air.
 May decompose violently at high temperature and/or pressure or in the presence of a catalyst
 May polymerize.

Conditions to avoid :
 - air or oxygen
 - water, humidity.
 - high temperatures

Materials to avoid :
 Oxidizing agents, acids, organic bases, amines, ammonia, and certain salts.
 Reacts explosively with certain alcohols or mercaptans. Reacts with HCl to form highly toxic ethylene chlorohydrins. Avoid copper, silver, magnesium, mercury, and their salts.

11. TOXICOLOGICAL INFORMATION

Acute toxicity	LD ₅₀ /oral/rat: 72 mg/kg LC ₅₀ /inhal/rat: 2.92 mg/l / 15min 1.44 mg/l / 4h
Irritating effects	Skin: Very irritating Eye: Very irritating
Is possible	Ethylene oxide caused damage to the blood picture and nervous system in an animal test after sub chronic exposure. The substance exhibits mutagenic properties (modifying the genetic make-up) in various test systems (microorganisms, cell cultures, mammals). The substance exhibits a carcinogenic effect in animal testing under the effect of long-term inhalation. In animals, an increased malformation rate in the maternal toxicity range has been observed.
Further information	Symptoms of contamination may occur after hours. Product can be absorbed over the skin. After inhalation of fairly large quantities: nausea, headache, vomiting, excitation, unconsciousness.

12. ECOLOGICAL INFORMATION

Acute Toxicity	Fish : Harmful: 10 < LC/EC/IC50 <= 100 mg/l Aquatic Invertebrates : Low toxicity: LC/EC/IC50 > 100 mg/l Microorganisms : Harmful: 10 < LC/EC/IC50 <= 100 mg/l
Mobility	When released to air, transfers to soil or water by wet and dry deposition. Dissolves in water.
Persistence/degradability	Inherently biodegradable. Rapidly hydrolyses in water and soil.
Bioaccumulation	Does not have the potential to bioaccumulate significantly.

13. DISPOSAL CONSIDERATIONS

Product	Must be dumped or incinerated in accordance with local regulations
Contaminated packaging	Uncontaminated packaging can be re-used. Packs that can not be cleaned should be disposed of at a licensed site.

14. TRANSPORT INFORMATION

Proper shipping name	ETHYLENE OXIDE
UN Nr	1040
Class	2
ADR/RID Classification code	2TF
ADR/RID Hazard Nr	263
Packing group	None
Labeling ADR	Label 2.3: toxic substance. Label 2.1: flammable gas
IMDG EmS codes	F-D, S-U
IMDG Marine pollutant	No
Passenger aircraft	FORBIDDEN

15. REGULATORY INFORMATION

EC Label Name :	ETHYLENE OXIDE
EC Annex I Number :	603-023-00-X
EC symbols	F+ Extremely flammable. T Toxic.
EC Risk Phrases :	R12 Extremely flammable R23 Toxic by inhalation R36/37/38 Irritating to eyes, respiratory system and skin R45 May cause cancer. R46 May cause heritable genetic damage.
EC Safety Phrases :	S53 Avoid exposure. Obtain special instructions before use. S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Recipients of our product must take responsibility for observing existing laws and regulations