

Material Safety Data Sheet



Nonflammable Gas Mixture: Ethylene Oxide 1ppm-3.6% / Nitrogen 96.4-99%

Section 1. Chemical product and company identification

Product Name : Nonflammable Gas Mixture: Ethylene Oxide 1ppm-3.6% / Nitrogen 96.4-99%

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Product use : Synthetic/Analytical chemistry.

MSDS# : 002747

Date of Preparation/Revision : **3/27/2006.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas.

Emergency overview : Warning!
CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
CONTENTS UNDER PRESSURE.
HARMFUL IF INHALED OR SWALLOWED.
CAUSES SEVERE EYE AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, LUNGS, REPRODUCTIVE SYSTEM, LIVER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
Do not ingest. Avoid contact with skin and clothing. Avoid breathing gas. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.
Contact with rapidly expanding gases can cause frostbite.

Routes of entry : Inhalation,Dermal,Eyes

Potential acute health effects

Eyes : Severely irritating to the eyes.

Skin : Severely irritating to the skin.

Inhalation : Toxic by inhalation.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects : **CARCINOGENIC EFFECTS** Classified 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH [Ethylene oxide]. Classified A2 (Suspected for human.) by ACGIH, 2 (Suspected for human.) by European Union [Ethylene oxide].
MUTAGENIC EFFECTS Classified 2 by European Union [Ethylene oxide].
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by overexposure : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Nitrogen	7727-37-9	96.4 - 99	ACGIH TLV (United States, 9/2004). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. Refers to Appendix A -- Carcinogens. TWA: 1.8 mg/m ³ 8 hour(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). Notes: Value is for minutes per day. See Appendix A - NIOSH Potential Occupational Carcinogen CEIL: 9 mg/m ³ 10 minute(s). Form: All forms CEIL: 5 ppm Form: All forms TWA: 0.18 mg/m ³ 10 hour(s). Form: All forms TWA: 0.1 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). STEL: 5 ppm 15 minute(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms
Ethylene Oxide	75-21-8	0.0001 - 3.6	

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire fighting measures

- Flammability of the product** : Non-flammable.
- Auto-ignition temperature** : The lowest known value is 428.88°C (804°F) (Ethylene oxide).
- Flash point** : The lowest known value is Open cup: -29.15°C (-20.5°F). (Ethylene oxide)
- Products of combustion** : These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).
- Fire fighting media and instructions** : Use an extinguishing agent suitable for surrounding fires.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.
No specific hazard.
- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

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Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

- Handling** : Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : Full chemical resistant suit and self-contained breathing apparatus only by trained and authorized persons.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

- Molecular weight** : Not applicable.
- Molecular formula** : Not applicable.
- Boiling/condensation point** : Not available.
- Melting/freezing point** : -112.77°C (-171°F) based on data for: Ethylene oxide. Weighted average: -206.58°C (-339.8°F)
- Critical temperature** : The lowest known value is -146.9°C (-232.4°F) (Nitrogen).
- Vapor density** : The highest known value is 1.52 (Air = 1) (Ethylene oxide). Weighted average: 0.99 (Air = 1)
- Specific Volume (ft³/lb)** : Not applicable.
- Gas Density (lb/ft³)** : Weighted average: 0.07

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Not considered to be reactive according to our database.

Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Ethylene Oxide	LD50	72 mg/kg	Oral	Rat
	LD50	270 mg/kg	Oral	Guinea pig
	LC50	800 ppm (4 hour (s))	Inhalation	Rat
	LC50	836 ppm (4 hour (s))	Inhalation	Mouse

Chronic effects on humans : **CARCINOGENIC EFFECTS** Classified 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH [Ethylene oxide]. Classified A2 (Suspected for human.) by ACGIH, 2 (Suspected for human.) by European Union [Ethylene oxide].

MUTAGENIC EFFECTS Classified 2 by European Union [Ethylene oxide].

Contains material which causes damage to the following organs: blood, kidneys, lungs, the reproductive system, liver, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material for humans.

Specific effects

Carcinogenic effects : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Ethylene Oxide	Pimephales promelas (LC50)	96 hour(s)	84 mg/l

Products of degradation : These products are carbon oxides (CO, CO₂) and water, nitrogen oxides (NO, NO₂...).

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Environmental fate : Not available.


Environmental hazards : No known significant effects or critical hazards.



Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
DOT Classification	UN1956	COMPRESSED GAS, N.O.S.	2.2	Not applicable (gas).		-

Nonflammable Gas Mixture: Ethylene Oxide 1ppm-3.6% / Nitrogen 96.4-99%						
TDG Classification	UN1956	COMPRESSED GAS, N.O.S.	2.2	Not applicable (gas).		Explosive Limit and Limited Quantity Index 0.125 Passenger Carrying Road or Rail Index 75
Mexico Classification	UN1956	COMPRESSED GAS, N.O.S.	2.2	Not applicable (gas).		-

Section 15. Regulatory information

United States

- U.S. Federal regulations** : TSCA 8(b) inventory: Nitrogen; Ethylene oxide
 SARA 302/304/311/312 extremely hazardous substances: Ethylene oxide
 SARA 302/304 emergency planning and notification: Ethylene oxide
 SARA 302/304/311/312 hazardous chemicals: Nitrogen; Ethylene oxide
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Nitrogen: Sudden Release of Pressure; Ethylene oxide: Fire hazard, reactive, Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
 Clean Water Act (CWA) 307: No products were found.
 Clean Water Act (CWA) 311: No products were found.
 Clean air act (CAA) 112 accidental release prevention: Ethylene oxide
 Clean air act (CAA) 112 regulated flammable substances: No products were found.
 Clean air act (CAA) 112 regulated toxic substances: Ethylene oxide

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: Ethylene Oxide	75-21-8	0.0001 - 3.6
Supplier notification	: Ethylene Oxide	75-21-8	0.0001 - 3.6

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

- State regulations** : Pennsylvania RTK: Nitrogen: (generic environmental hazard); Ethylene oxide: (special hazard, environmental hazard, generic environmental hazard)
 Massachusetts RTK: Nitrogen; Ethylene oxide
 New Jersey: Nitrogen; Ethylene oxide

- California prop. 65** : **WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Ethylene Oxide	Yes.	Yes.	Yes.	Yes.

Canada

- WHMIS (Canada)** : Class A: Compressed gas.
 Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
 Class D-2A: Material causing other toxic effects (VERY TOXIC).
 CEPA DSL: Nitrogen; Ethylene oxide

Section 16. Other information

United States

Label Requirements

- : CANCER HAZARD
- CONTAINS MATERIAL WHICH CAN CAUSE CANCER
- CONTENTS UNDER PRESSURE.
- HARMFUL IF INHALED OR SWALLOWED.
- CAUSES SEVERE EYE AND SKIN IRRITATION.
- CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LUNGS, REPRODUCTIVE SYSTEM, LIVER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.

Canada

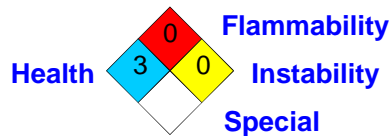
Label Requirements

- : Class A: Compressed gas.
- Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
- Class D-2A: Material causing other toxic effects (VERY TOXIC).

Hazardous Material Information System (U.S.A.)

Health	*	3
Fire hazard		0
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.