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**MSDS: Ethylene Oxide**

## PRODUCT INFORMATION

**PRODUCT:** Ethylene Oxide  
**TRADE NAME:** Ethylene Oxide or Oxirane  
**CHEMICAL NAME:** Ethylene Oxide or Oxirane or 1,2-Epoxyethane  
**SYNONYMS:** Epoxyethane  
**FORMULA:** C<sub>2</sub>H<sub>4</sub>O  
**CHEMICAL FAMILY:** Epoxide  
**SUPPLIER'S NAME:** MEGS Inc.  
**SUPPLIER'S ADDRESS:** 2675 De Miniac  
Ville St-Laurent, Qc, H4S 1E5  
**EMERGENCY PHONE NUMBER:** (514) 956-7503  
**MOLECULAR WEIGHT:** 44.06  
**PRODUCT USE:** Various  
**PRODUCT IDENTIFICATION UN 1040  
NUMBER:**

## HAZARDOUS INGREDIENTS

<b>CHEMICAL ID</b>	<b>CONCENTRATION</b>	<b>CAS #</b>	<b>LD(50)</b>	<b>LC(50)</b>
Ethylene Oxide	99+%	75-21-8	Oral- Rat 72 mg/kg	Inhl-Rat 1462 ppm/4 h

## PHYSICAL DATA

**PHYSICAL STATE:** Gas and liquid under pressure  
**APPEARANCE:** Colorless gas and liquid with a sweet odor  
**ODOR:** See above  
**ODOR THRESHOLD:** Unknown  
**SPECIFIC GRAVITY (H<sub>2</sub>O = 1):** Liquid @ Boiling Point = 0.888

**VAPOR PRESSURE:** @ 15°C = 123 kPa  
**VAPOR DENSITY (air = 1):** 1.73  
**EVAPORATION RATE:** Unknown  
**BOILING POINT:** 10.45°C  
**FREEZING POINT:** -112.55°C  
**pH:** Unknown  
**GAS DENSITY:** Liquid 883 kg/m<sup>3</sup> @ 15°C, 101.3 kPa  
**COEFFICIENT OF WATER/OIL:** Reacts with water to form a hydrate  
**DISTRIBUTION:**

### FIRE OR EXPLOSION HAZARD

**CONDITIONS OF FLAMMABILITY:** Flammable in air over an extremely wide range

**MEANS OF EXTINCTION:** Water mist or spray, carbon dioxide, dry chemicals and foams. "Stop flow of gas before extinguishing fire".

**FLASHPOINT AND METHOD OF DETERMINATION:** Unknown

**UPPER EXPLOSION LIMIT (% BY VOL):** 100

**LOWER EXPLOSION LIMIT (% BY VOL):** 3

**AUTO-IGNITION TEMPERATURE:** 430°C

**FLAMMABILITY CLASSIFICATION:** Class 1, group not specified

**HAZARDOUS COMBUSTION PRODUCTS:** None

**EXPLOSION DATA:** Yes, with caustic soda, quicklime, magnesium chloride, ammonia, alcohols and amines.

**SENSITIVITY TO STATIC DISCHARGE:** Yes

### REACTIVITY DATA

**CHEMICAL STABILITY:** Unstable, avoid high temperature. Store below 12°C.

**INCOMPATIBLE MATERIALS:** Most metals other than stainless steel or nickel will cause polymerization or decomposition.

**CONDITIONS OF REACTIVITY:** Avoid heat and contact with metals other than nickel or stainless steel.

**HAZARDOUS DECOMPOSITION PRODUCTS:** None

## TOXICOLOGICAL PROPERTIES

### ROUTES OF ENTRY:

**SKIN CONTACT:** The vapor is irritating to the eyes and the liquid can cause delayed burns if it contacts the skin or eyes. Aqueous solution of ethylene oxide are also irritating. It is also reported that rapid evaporation of the liquid on contact with the skin can cause a type of frostbite.

**SKIN ABSORPTION:** None

**EYE:** See Skin Contact, above

**INHALATION:** Low concentrations if inhaled will cause delayed nausea. Inhalation of high concentrations results in a narcotic and possible neurotoxic effect, possibly followed by coughing, vomiting and irritation to the respiratory passages which will eventually lead to emphysema, bronchitis and pulmonary edema. It has been reported to cause rapid olfactory fatigue.

**INGESTION:** None

**ACUTE OVER EXPOSURE EFFECTS:** The neurotoxic or narcotic effect results in respiratory failure with acute pulmonary edema. Comas with metabolic acidosis and oxaluria have also been observed. It has been known to cause chronic intoxication in humans. Frostbite effects are a change in color of the skin to gray or white, possibly followed by blistering.

**CHRONIC OVER EXPOSURE EFFECTS:** See below

**EXPOSURE LIMITS:** TWA = 1 molar ppm

**IRRITANCY OF PRODUCT:** See Skin and Eyes, above.

**SENSITIZATION TO MATERIAL:** None known

**CARCINOGENICITY, REPRODUCTIVE EFFECTS:** A 2 - Suspected human carcinogen (ACGIH 1995-1996)

**TERATOGENICITY, MUTAGENICITY:** Yes, in animals

**TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None

## PREVENTIVE MEASURES

**PERSONAL PROTECTIVE EQUIPMENT:** Protective gloves. Safety glasses, safety goggles and face shield. Safety shoes, safety shower, eyewash "fountain". Positive air supply.

**SPECIFIC ENGINEERING CONTROLS:** Metals acting as catalysts for the decomposition of ethylene oxide include copper, silver, mercury, magnesium and their alloys. Potassium, tin, zinc, aluminum and iron oxides tend to accelerate the polymerization of ethylene oxide.

**LEAK AND SPILL PROCEDURES:** EVACUATE ALL PERSONNEL FROM AFFECTED AREA.

Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on container or container valve, contact the closest MEGS location.

**WASTE DISPOSAL:** Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

**HANDLING PROCEDURES AND EQUIPMENT:** USE ONLY IN WELL-VENTILATED AREAS.

Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinders by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not tamper with (valve) safety device. Close valve after each use and when empty.

**STORAGE REQUIREMENTS:** Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must 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 being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

**TDG CLASSIFICATION:** 2.1

**WHMIS CLASSIFICATION:** A, B2, D1

**SPECIAL SHIPPING INFORMATION:** Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

## **FIRST AID MEASURES**

**SPECIFIC FIRST AID PROCEDURES:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ETHYLENE OXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS

**INHALATION:** Conscious persons should be moved to an uncontaminated area, made to recline, kept warm and given warm water in amounts adequate to purge their stomachs of the ethylene oxide contamination. In the event of severe exposure, oxygen should also be administered by a competent person. The physician should look for signs of lung congestion. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Once respiration has been restored, treatment should be as above.

**EYE CONTACT:** PERSONS WITH POTENTIAL EXPOSURE TO ETHYLENE OXIDE SHOULD NOT WEAR CONTACT LENSES.

In the event of liquid or cold gas exposure; flush contaminated eye(s) with copious quantities of water. Part eyelids with fingers to assure complete flushing. Continue for a minimum of 15 minutes. Repeat for subsequent 15 minute periods if irritation returns.

**SKIN CONTACT:** Dermal Contact or Frostbite: Remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

## **PREPARATION INFORMATION**

**PREPARED BY:** Safety Department

**DATE PREPARED:** 01/01/1999

**LAST REVISION DATE:** 05/21/2002

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