

Material Safety Data Sheet

ETHYLENE OXIDE

Statement of Hazards:

Section 1 Chemical Product & Company Identification

Product: ETHYLENE OXIDE

Manufactured by:

ARC SPECIALTY PRODUCTS BALCHEM CORPORATION

52 Sunrise Park Road
New Hampton, New York 10958

Information Telephone: (845) 326-5611
www.arcspecialtyproducts.com

EMERGENCY TELEPHONE
(24 hrs./7days per week):
CHEMTREC (800) 424-9300
OUTSIDE U.S. & CANADA (703) 527-3887
(Collect calls accepted)

Section 2 Composition/Information on Ingredients

CHEMICAL NAME: Ethylene Oxide
WEIGHT BY %: 100%
CHEMICAL FAMILY: Epoxide
FORMULA: (CH₂)₂O
MOLECULAR WEIGHT: 44.06 gms/mole
CAS NUMBER: 75-21-8
CAS NAME: Oxirane
SYNONYMS: EO, EtO, Dihydroxirene, 1-2 Epoxyethane, Dimethylene Oxide, Oxane, Oxirane, Alkene Oxide, Alpha/Beta-Oxidoethane, Oxacyclopropane.
PRODUCT USES: Chemical intermediate for production of anti-freeze, polyester resins, non-ionic surfactants and specialty solvents; sterilizing agent for controlling microorganisms in health care applications; fumigant for controlling insect infestation in whole and ground spices and cosmetics.

Section 3 Hazard Identification

EMERGENCY OVERVIEW

Colorless liquid or heavier-than-air gas with a sweet, ether-like odor. Extremely flammable liquified gas which burns in the absence of oxygen and can explode when exposed to elevated temperatures. Toxic when inhaled. Causes severe skin and eye irritation or burns and respiratory tract irritation; effects may be delayed. Harmful if swallowed or absorbed through the skin. Contact with liquid may cause frostbite.

DANGER!

Extremely flammable liquid and gas under pressure. May form explosive mixtures with air. Highly Reactive. Harmful or fatal if inhaled and may cause delayed lung injury, respiratory system and nervous system damage. Inhalation may cause dizziness or drowsiness. Liquid contact may cause frostbite. May cause allergic skin reaction. Harmful if swallowed. May cause adverse blood effects, liver and kidney damage based on animal data. Cancer and reproductive hazard.

HAZARD RATINGS: (0 = minimum; 4 = maximum)

HMIS Rating: Health = 3
Flammability = 4
Reactivity = 3
Personal Protection Code = X (Consult your supervisor or standard operating procedures for special handling directions.)

NFPA Rating: Health = 3
Flammability = 4
Reactivity = 3

Exposure Limits:	TWA (8-hr)		STEL (15-min)
	OSHA	1 ppm	5 ppm
ACGIH	1 ppm	n/a	

PRIMARY ROUTES OF EXPOSURE: Inhalation; eye contact; skin contact/absorption.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Effects include skin, eye and respiratory tract irritation or burns. Central nervous system effects initially cause headache, dizziness and nausea and in extreme cases, unconsciousness and death. Peripheral nerve damage may result in muscular weakness, giddiness, irrational behavior and loss of sensation in the extremities. Dulling of the sense of smell may occur.

ACUTE HEALTH EFFECTS:

INHALATION: Inhaling concentrated vapor may cause serious health effects, possibly death. Inhalation may progressively cause mucous membrane and respiratory irritation, headache, vomiting, cyanosis, drowsiness, weakness, incoordination, CNS depression, lachrymation, nasal discharge and salivation, gasping, and labored breathing. Delayed effects may include nausea, diarrhea, edema of the lungs, paralysis, convulsions and possibly death. NOTE: Ethylene oxide has a high odor threshold (> 250 ppm) and the sense of smell does not provide adequate protection against its toxic effects.

EYE CONTACT: Liquid ethylene oxide is severely irritating and corrosive to the eyes and contact can cause swelling of the conjunctiva and irreversible corneal injury. Contact with liquid ethylene oxide can cause frostbite. Vapors may cause eye irritation, tearing, redness and swelling of the conjunctiva.

SKIN CONTACT: Prolonged contact with liquid ethylene oxide can cause a local erythema, edema, and formation of blisters.

Response is more severe on damp skin. There may be a latency period of several hours prior to the onset of symptoms. Ethylene oxide may be absorbed by the skin, and sustained contact may produce adverse effects such as headache, dizziness, nausea and vomiting. Ethylene oxide is a skin sensitizer and some individuals may suffer an allergic skin reaction. Skin contact may also cause allergic contact dermatitis in some exposed individuals. Liquid ethylene oxide evaporates rapidly and may chill the skin causing frostbite.

INGESTION: This relatively unlikely route of exposure is expected to cause severe irritation and burns of the mouth and throat, abdominal pain, nausea, vomiting, collapse and coma. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

CHRONIC HEALTH EFFECTS:

SKIN CONTACT: Long term effects are unknown but are expected to be similar to acute effects of skin exposure.

EYE CONTACT: Some cases of cataract formation have been reported.

INHALATION: Respiratory irritation which can result in permanent lung injury, chromosomal aberrations and peripheral neurotoxic effects with a numbing of the sense of smell. Cognitive and CNS impairment may result from long term exposures.

INGESTION: May cause anemia, gastrointestinal irritation, effects on liver, kidneys, and adrenal glands.

CARCINOGENICITY:

OSHA classifies ethylene oxide as a cancer/reproductive hazard and considers that, at excessive levels, ethylene oxide may present reproductive, mutagenic, genotoxic, neurologic and skin sensitization hazards.

ACGIH classifies ethylene oxide as "A2" - suspected human carcinogen.

NTP classifies ethylene oxide as a known human carcinogen.

IARC classifies ethylene oxide in Group I (carcinogenic to humans).

NIOSH classifies ethylene oxide as a potential human carcinogen.

Section 4 First Aid Measures

EYE CONTACT: Immediately flush eyes, including the entire surface of the eyes and under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. Obtain medical attention immediately. **NOTE: Never wear contact lenses when working with ethylene oxide.**

SKIN CONTACT: Immediately flush skin thoroughly with water for at least 15 minutes while removing contaminated clothing and shoes. Obtain medical attention immediately. Treat for possible cryogenic injury, if needed by warming affected areas with warm water (wrap with a blanket if warm water is not available). Wash clothing before reuse and discard contaminated leather articles such as shoes and belts.

INHALATION: Remove exposed person to fresh air. If breathing has stopped, give artificial respiration then have qualified

personnel administer oxygen, if needed. Get immediate medical attention.

INGESTION: If patient is conscious give plenty of water (minimum of two glasses) but **DO NOT INDUCE VOMITING**. This material is corrosive. Keep head lower than hips to avoid aspiration, should vomiting occur. Get medical attention immediately.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Preexisting skin, eye and respiratory disorders; lung, blood, nervous system and peripheral nerve disorders.

NOTE TO PHYSICIANS: Respiratory symptoms include nausea, vomiting and irritation of the nose and throat. Pulmonary edema may occur. Respiratory effects may be delayed. Consider oxygen administration. If a chemical burn is present, decontaminate skin and treat as any thermal burn. No specific antidote is known, however consider gastric lavage and administration of a charcoal slurry.

Section 5 Fire Fighting Measures

FLASH POINT (Test Method):

Tag Closed Cup: -4°F (-20°C)

FLAMMABLE LIMITS IN AIR (% BY VOLUME):

Upper flammable limit: 100%
Lower flammable limit: 3.0%

NFPA HAZARD RATING:

Health: 3; Flammability: 4; Reactivity: 3

AUTO IGNITION TEMPERATURE:

804°F (429°C); Burns in the absence of air

SPECIAL FIRE-FIGHTING PROCEDURES:

Wear NIOSH-approved self-contained breathing apparatus (SCBA) operated in the pressure-demand mode and full chemical-resistant protective clothing. Evacuate all personnel from danger area and keep upwind. Immediately cool containers with water spray from maximum safe distance. Stop flow of gas, if without risk, while continuously cooling containers with water. Do not extinguish flames unless flow is stopped, since explosive re-ignition can occur. Remove containers from fire area, if without risk. Refer to the most current edition of the "North American Emergency Response Guidebook" for isolation and evacuation distances.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or water spray for small fires. Water spray, polymer or alcohol resistant foams for large fires. Dilution of liquid ethylene oxide with 23 volumes of water should render it non-flammable. Dilution with 100 parts water to one part of ethylene oxide vapor may be required to control build up of flammable vapors in closed systems. Water spray can be used to reduce intensity of flames, to cool fire-exposed containers and to dilute spills to render non-flammable.

HAZARDOUS DECOMPOSITION PRODUCTS:

Carbon monoxide and carbon dioxide.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Ethylene oxide is dangerously explosive under fire conditions; it is flammable over an extremely large range of concentrations in air and burns in the absence of oxygen. Liquid ethylene oxide is lighter than water (floats) and vapors are heavier than air and may travel along ground long distances to sources of ignition, and then flash back. Avoid storage at warm temperatures. Do not store at 100°F in order to prevent polymerization. Avoid storage at temperatures above 125°F under any circumstances. Containers are fitted with metallic plugs which melt and release contents when temperature increases to a range of 157-170°F (69-77°C). Vapors are extremely flammable and are readily ignited by static charge, sparks and flames at concentrations above 3%.

Section 6 Accidental Release Measures

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.

SPILL CLEANUP: 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 (800-424-8802) if 10 pounds (4.54 Kg) or more is spilled or released to the environment.

Section 7 Handling and Storage

HANDLING AND STORAGE PRECAUTIONS: Wear all recommended protective clothing and devices when handling this material. Have established handling and emergency response procedures in place prior to use. Ground and bond shipping container, transfer line, and receiving container. Protect containers from physical damage and regularly inspect them for cracks, leaks or faulty valves.

ENGINEERING CONTROLS: Ethylene oxide, a major fire hazard, can burn in the absence of oxygen. All electrical devices used in areas processing or handling ethylene oxide must be engineered and designed to the applicable local electrical/fire codes. Safeguards can include designing electrical devices as explosion-proof and/or intrinsically safe. When considering engineering controls, users of ethylene oxide should consult the current edition of NFPA 55 (Storage, Handling, and Use of Compressed Gases). Sterilization facilities should consult NFPA 560 (Storage, Handling, and Use of Ethylene Oxide for Sterilization and Fumigation) and NIOSH Publication NO. 2000-119 (Alert: Preventing Worker Injuries and Deaths from Explosions in Industrial Ethylene Oxide Sterilization Facilities).

ATTENTION: Ethylene oxide vapors are colorless and odorless above OSHA's permissible exposure level. An air monitoring system is recommended to determine airborne exposure levels.

STORAGE SEGREGATION: Store ethylene oxide in a cool, dry, well-ventilated area away from incompatible chemicals and sources of ignition. Store cylinders and drums upright; secure containers tightly; do not drag or slide; and move in a carefully supervised manner with a suitable hand truck. **DO NOT STORE IN DIRECT SUNLIGHT.**

INCOMPATIBILITIES: Ethylene oxide is very reactive. Runaway exothermic polymerization reactions can result from contamination with amines, ammonia, water, acids, bases, metal chlorides, metal oxides, metallic potassium, mercaptans, alcohols, oxidizers and many other organic and inorganic materials.

SHIPPING AND STORAGE CONTAINERS: (See 49 CFR 173.323) Ethylene oxide is shipped and stored in UN 1A1 specification drums, DOT specification drums and cylinders. Nitrogen must be charged into the container after filling with ethylene oxide, bringing the total container pressure up to 50 psig. Before returning container to supplier, pressurize container with nitrogen to 50 psig total pressure; replace valve plugs tightly in outlets. **Check container valves and plugs for leaks prior to shipment.** In addition, please refer to the most current edition of NFPA Publication 560, "Standard for the Storage, Handling and Use of Ethylene Oxide for Sterilization and Fumigation".

Section 8 Exposure Controls / Personal Protection

EXPOSURE LIMITS:

OSHA ACTION LEVEL (8 HR. TWA):	0.5 ppm
OSHA PEL (8 HR. TWA):	1 ppm
OSHA 15 MINUTE EXCURSION LIMIT:	5 ppm; 9 mg/m ³
ACGIH TLV/TWA:	1 ppm; 1.8 mg/m ³
IDLH:	800 ppm

RESPIRATORY PROTECTION: Refer to OSHA respirator regulations cited at 29 CFR 1910.134 and 29 CFR 1910.1047. Wear a NIOSH-approved full facepiece respirator for routine use situations where atmosphere is at or above OSHA's Action Level. Do not exceed the maximum use conditions of the respirator. For emergency or non-routine uses where concentrations are unknown, wear an SCBA with a full facepiece operated in the pressure-demand or positive pressure mode.

EYE PROTECTION: Always wear chemical safety glasses. If splashing may occur, wear a full face shield as a supplementary protective measure over safety glasses. **NEVER WEAR CONTACT LENSES** when working with ethylene oxide.

SKIN PROTECTION: Wear impervious gloves (see www.ethyleneoxide.com for permeation data); boots; aprons; head cover; and clean impervious body-covering clothing to prevent any possibility of skin contact. Launder contaminated clothing and discard contaminated leather shoes, belts, etc.

VENTILATION: Install and operate general and local exhaust ventilation systems powerful enough to maintain airborne levels of ethylene oxide below the OSHA PEL in the worker's breathing area. Ventilation systems must be of maximum explosion-proof design. Emission controls must be in compliance with Federal, State and local regulations.

SAFETY SHOWERS: Have eyewash stations, emergency deluge showers, and washing facilities available in all work areas.

OTHER PROTECTION: Design all engineering systems to be explosion-proof in any area where this gas may be present. Container and system must be electrically grounded/bonded before unloading. Practice good personal hygiene; always wash thoroughly after using this material. Do not eat, drink or smoke in work area.

Section 9 Physical and Chemical Properties

Boiling Point:	50.9°F (10.5°C)
Freezing Point:	-169° F (-111.7°C)
Specific Gravity:	0.871 at 20°C
Vapor Pressure:	1094 mm Hg @ 20°C
Vapor Density (Air = 1):	1.5
Solubility in Water:	100%
Molecular Weight:	44.06 grams / mole
Percent Volatile by Volume	100%
Evaporation rate (Butyl Acetate = 1):	Not applicable
pH:	7, neutral (100 grams/liter in water)
Appearance and Odor:	Colorless liquid or gas with sweet ether-like odor. Odor threshold: 261 ppm (detectable); 500-700 ppm (recognizable).
Log Octanol/Water Partition Coefficient (log Kow):	-0.3

Section 10 Stability and Reactivity

HAZARDOUS POLYMERIZATION: Dangerous exothermic polymerization reaction can occur when ethylene oxide is contaminated or when heated.

STABILITY: Material is stable for extended periods in closed, airtight, pressurized containers at room temperature, under normal storage and handling conditions. Vapors may explode when exposed to common ignition sources. In the presence of catalysts, polymerization and decomposition of liquid may occur and is accelerated at temperatures above 800°F (426°C).

CONDITIONS TO AVOID: Avoid storage at warm temperatures. Do not store at 100°F or greater in order to prevent polymerization. Avoid storage at temperatures above 125°F under any circumstances. Avoid contact of ethylene oxide with incompatible chemicals to avoid highly exothermic polymerization reaction. Prevent exposure to all sources of ignition such as heat, flame, lighted tobacco products or electrical or mechanical sparks.

HAZARDOUS DECOMPOSITION PRODUCTS: Ethylene oxide undergoes thermal decomposition to form carbon dioxide and carbon monoxide gases.

Section 11 Toxicological Information

TOXICOLOGICAL - ACUTE INHALATION: LC₅₀ (1 hr. exposure)
5748 ppm (male rat)
4439 ppm (female rat)
5029 ppm (rat - combined sexes)

Various mammalian species exposed to lethal concentrations of ethylene oxide had symptoms of mucous membrane irritation, central nervous system depression, lacrimation, nasal discharge, salivation, nausea, vomiting, diarrhea, respiratory irritation, incoordination and convulsions.

TOXICOLOGICAL - CHRONIC INHALATION: Symptoms of chronic exposure are similar to those observed in acute studies, including lung, kidney and liver damage and testicular tubule degeneration in some species. Studies demonstrated neuromuscular effects as the most sensitive indicator of ethylene oxide overexposure.

TOXICOLOGICAL - ACUTE DERMAL: No dermal LD₅₀ information is available on this product. It is expected to be corrosive to rabbit skin.

TOXICOLOGICAL - CHRONIC DERMAL: No chronic dermal toxicity data are available on this product.

TOXICOLOGICAL - EYE: No eye irritation animal data are available on this product; however, it is expected to be extremely irritating to rabbit eyes.

TOXICOLOGICAL - ACUTE INGESTION: The acute oral LD₅₀ for this product is: 72 mg/kg, rat

TOXICOLOGICAL - CHRONIC INGESTION: The effects of chronic ingestion of this product are unknown.

CARCINOGENICITY: A recent assessment of available epidemiology studies related to ethylene oxide concluded that the evidence indicates that ethylene oxide does not cause heart disease, an excess of cancers overall, or brain, stomach or pancreatic cancers which were seen in some animal and isolated human studies. The findings with respect to leukemia and non-Hodgkins lymphoma are less definitive. While the majority of the evidence does not indicate that ethylene oxide causes these cancers, there are some suggestive trends. A longer follow-up of ethylene oxide was completed in 2004 to better clarify these relationships. NIOSH reported no overall elevated risk for any type of cancer or other diseases as compared to the general population, however, among those workers with very high ethylene oxide exposure (combination of exposure level and years worked); there was evidence of an elevated risk for blood cancers among men and breast cancer among women. Two inhalation studies with rats demonstrated carcinogenic responses consisting of increased incidences of mononuclear cell leukemia, peritoneal mesotheliomas, and primary brain tumors. In 2-year inhalation studies with mice there was evidence of carcinogenic activity as indicated by dose-related incidences of benign or malignant neoplasms of the uterus, mammary gland, and hematopoietic system (lymphoma).

MUTAGENICITY: While ethylene oxide has demonstrated, in epidemiological studies with exposed workers, an increased incidence of chromosomal aberrations and sister chromatid exchanges, the relevance of such effects to human health hazard evaluation is currently uncertain. In rodent studies, dose related exposure to ethylene oxide induces increases in

numbers of adducts in DNA and hemoglobin. Laboratory studies with mice have shown that acute exposure to ethylene oxide at 300 ppm and above caused testicular injury as evidenced by concentration-related increased embryonic deaths following mating of exposed males to non-exposed females (Dominant-Lethal Test).

NEUROTOXICITY: Effects are similar to those of acute (short term) exposure, namely, headaches, nausea, diarrhea, lethargy and irrational behavior. Muscle weakness, loss of sensation in the extremities and a reduction in the sense of smell and/or taste may also result. Studies on workers indicate that CNS and cognitive impairment may result from chronic exposures to ethylene oxide.

REPRODUCTIVE EFFECTS: Some limited epidemiological data suggests that women exposed to ethylene oxide have a greater incidence of miscarriage. A one-generation reproduction study in rats showed decreased numbers of pups at 100 ppm but not at 33 ppm. In a two-generation reproduction study involving exposure of rats to ethylene oxide vapor for 6 hrs/day, 5 days/week, there was parental toxicity at 33 ppm and 100 ppm. Post implantation losses with reduction in litter size and offspring body weight were found at 33 ppm and 100 ppm. The no-observable effect concentration for adult toxicity, offspring effect and reproductive effect was 10 ppm.

TERATOLOGY: Inhalation development toxicity studies with rats exposed to ethylene oxide vapor at concentrations of 50 ppm, 125 ppm and 225 ppm showed that maternal toxicity occurred at 125 and 225 ppm. Fetotoxicity, evidenced by reduced fetal body weight, occurred at all concentrations. At 225 ppm and to a lesser extent at 125 ppm an increased incidence of skeletal variants was found. There was no evidence of embryotoxicity or malformations.

TARGET ORGANS: Overexposure to this product may effect the skin, eyes, respiratory system, liver, kidneys, brain, blood, reproductive system and central nervous system.

Section 12 Ecological Information

Ecotoxicological Data

AQUATIC TOXICITY:

Acute 96-hr. LC₅₀ data:

- 57-84 mg/L, fathead minnow (*Pimephales promelas*)
- 90 mg/L, goldfish (*Carassius auratus*)
- 137-300 mg/L, water flea (*Daphnia magna*)

Material is slightly toxic to marine invertebrates.

48 hr. LC₅₀ in brine shrimp: 490 mg/L

CHEMICAL FATE INFORMATION:

- BOD₅: 0.35 p/p.
- BOD₁₀: 1.1 p/p.
- BOD₂₀: 1.3 p/p.

Log octanol/water partition coefficient (log Kow) is low. Partitioning from water to oil is low. Bioconcentration is not expected to occur due to high water solubility and a low log Kow. Ethylene oxide hydrolyzes to ethylene glycol. Biodegradation of ethylene oxide occurs at a moderate rate after acclimation (3-5% degradation after 5 days; 52% after 20 days). Biodegradation is expected in a wastewater treatment plant. Ethylene oxide has an estimated half life in the atmosphere of 211 days. A high adsorptivity in soil is expected.

Section 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.

Section 14 Transport Information

TRANSPORTATION DATA:

DOT Proper Shipping Name: Ethylene Oxide
DOT Class or Division: 2.3 (Poison Gas)
Inhalation Hazard, Zone D
Identification Number: UN 1040
Packing Group: None
DOT Label(s): Primary: Poison Gas (2.3)
Subsidiary: Flammable Gas (2.1)
DOT Placard: Primary: Poison Gas (2.3)
Subsidiary: Flammable Gas (2.1)
Reportable Quantity (RQ): 10 lb. (4.54 kg)
ERG2008 Guide #: 119
DOT Packaging: See Section 7, "Handling and Storage"

IMO CLASS: 2.3; 2.1
IMO LABEL(S): Toxic Gas; Flammable Gas

TDG REGULATIONS (Transportation between points within Canada):

Shipping Name: Ethylene Oxide with Nitrogen
UN Number: UN 1040
Class(es): 2.3, 2.1

Shipments of residual amounts of ethylene oxide are considered hazardous material. All facilities shipping or receiving ethylene oxide are subject to registration as a shipper of hazardous material (49 CFR 107, Subpart G). All facilities handling ethylene oxide must also maintain a written security plan (49CFR172.00 – 804, 49CFR172.704).

Section 15 Regulatory Information

U.S. REGULATIONS:

TSCA status: Listed
CERCLA Section 103 (40 CFR 302.4): Listed
10 lb Reportable Quantity
SARA Section 302 (40 CFR 355.30): Listed
1000 lb Threshold Planning Quantity
SARA Section 304 (40 CFR 355.40): Listed
1 lb Reportable Quantity
SARA Section 311/312 (40 CFR 370.21) Hazard Categories met:
Acute, Chronic, Fire, Reactive, Sudden Release
SARA Section 313 (40 CFR 372.65): Listed
OSHA (29 CFR 1910.1200): Meets criteria as a hazardous material
OSHA(29 CFR 1910.1047): Ethylene Oxide Standard
OSHA Process Safety Management (29 CFR 1910.119): Listed
5000 lb Threshold Quantity
EPA list of Hazardous Air Contaminants: Listed
EPA Organic Hazardous Air Pollutant (HAP) list
(40 CFR 61.01): Listed
EPA list of Pesticide Chemicals (40 CFR 180.151): Listed
EPA Accidental Release Prevention Toxic Substance
(40 CFR 68.130): Listed 10,000 lb Threshold Quantity
EPA NESHAPS (40 CFR 63.360)
VOC Rule: 100% VOC

STATE RIGHT-TO-KNOW REGULATIONS:

California Proposition 65: Listed; cancer hazard; reproductive hazard
California Director's List: Listed
Florida Hazardous Substance List: Listed
Massachusetts Extraordinarily Hazardous Substance List: Listed
Minnesota Hazardous Substance List: Listed
New Jersey Hazardous Substance List: Listed sn 0882
(Special Hazardous Substance; Environmental Hazardous Substance)
Pennsylvania Right-to-know List: Listed

CANADIAN REGULATIONS:

WHMIS: Ingredient Disclosure List: Listed 0.1%, item 725 (1310)
WHMIS Classification: A; B1; D1A; D2A; D2B; F.

This MSDS complies with the Canadian Controlled Product Regulations.

Section 16 Other Information

GLOSSARY OF TERMS AND ABBREVIATIONS

ACGIH – American Conference of Governmental Industrial Hygienists
BOD 5, 10, 20 - Biochemical Oxygen Demand, 5, 10 or 20 day
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act
CAS – Chemical Abstract Service
CFR – Code of Federal Regulations
CNS – Central nervous system
DOT – U.S. Department of Transportation
EPA – U.S. Environmental Protection Agency
HMIS – Hazardous Materials Information System
IARC – International Agency for Research on Cancer
IDL – Ingredient disclosure list
IDLH – Immediately dangerous to life and health
IMO – International Maritime Organization
HAP – Hazardous Air Pollutant
LC 50 – Median lethal dose that kills 50% of an exposed population by the inhalation route
LD 50 – Median lethal dose that kills 50% of an exposed population by the oral (or dermal) route
ERG2000 – 2000 Emergency Response Guidebook
HESHAPS – National Emission Standards for Hazardous Air Pollutants
NFPA – National Fire Protection Association
NIOSH – National Institute of Occupational Safety and Health
NTP – National Toxicology Program
OSHA – Occupational Safety and Health Administration
p/p – Parts per part
PEL – Permissible exposure limit
PVC – Polyvinyl chloride
ppm – Parts per million
p.s.i.g. – Pounds per square inch (gauge pressure)
RCRA – Resource, Conservation and Recovery Act
SARA – Superfund Amendment and Reauthorization Act of 1990
SCBA – Self-contained breathing apparatus
STEL – Short term exposure limit
TDG – Transportation of Dangerous Goods
TLV – Threshold limit value
TSCA – Toxic Substances Control Act
TWA – Time weighted average
VOC – Volatile organic compound
WHMIS – Workplace Hazardous Material Information System Regulations.

MSDS Revision Date: 20 May 2011
Supersedes Date: 22 Jul 2009

Reason for update: Periodic review. The most recent revision of this MSDS is available online at www.arcspecialtyproducts.com, or by calling 845-326-5611.

DISCLAIMER:

It is imperative that the user/reader be familiar with and adhere to OSHA regulations which are specific to ethylene oxide (29CFR1910.1047) as well as any other applicable Federal, State or local government regulations. Regulations listed in Section 15 of this document may not be all inclusive and are subject to change. The data in this MSDS is furnished gratuitously independent of any sale of the product, only for your investigation and independent verification. While the information is believed to be correct, ARC makes no representation as to the accuracy of the information contained herein. ARC shall in no event be responsible for any damages of whatsoever nature directly or indirectly resulting from publication or use of, or reliance upon data contained herein. No warranty (either expressed or implied) of merchantability or of fitness for any purpose with respect to the product or to the data herein is made hereunder.