

MATERIAL SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product (material) Name: Propylene Oxide. Catalogue No. C156, C156-1.
Other Names: 1-2 Epoxypropene, Propene Oxide, Methyl Ethylene Oxide, Methoxorane, Propylene Epoxide, Epoxypropene.
Recommended Use: Used primarily as an intermediate in the synthesis of other chemicals and polymers; as a fumigant for dried fruits and food stuffs; as a mixture with CO₂; as a stabilizer for methylene chloride; treating wood for termite resistance; acid scavenger; pH control agent; as a treatment chemical for removing residual from crude polyolefins.

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SECTION 2 - HAZARDS IDENTIFICATION

Hazard Classification: Hazardous according to criteria of NOHSC.
Risk Phrases:
Safety Phrases:

SECTION 3 - COMPOSITION /INFORMATION ON INGREDIENTS

SUBSTANCE:
Chemical Identity: Propylene Oxide
Common Name(s): 1-2 Epoxypropene, Propene Oxide, Methyl Ethylene Oxide, Methoxorane, Propylene Epoxide, Epoxypropene
CAS Number(s): 75-56-9

MIXTURE:

Ingredients	Cas Number(s)	Proportion (%)
Propylene Oxide C ₃ H ₆ O	75-56-9	100

SECTION 4 - FIRST AID MEASURES

Swallowed: Administer 2-3 glasses of lukewarm water. Do not induce vomiting; risk of damage to lungs exceeds poisoning risk. Obtain immediate emergency medical treatment.

Eye: Immediately flush eyes with large amounts of water for at least 15-20 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin: Remove contaminated clothing and shoes. Immediately wash exposed area with large quantities of mild soap and water. Flush with lukewarm water for at least 15 minutes. Seek prompt medical attention.

Inhaled: Remove exposed person to fresh air. If breathing has stopped, give artificial respiration, then oxygen if needed. Contact physician immediately.

First Aid Facilities: Safety Shower, eyebath.
Medical Attention & Special Treatment:

ADDITIONAL INFORMATION:

SECTION 5 - FIRE FIGHTING MEASURES

Suitable Extinguishing Media:	Dry chemical; Alcohol resistant foam; Carbon dioxide. Water spray/fog can be used for cooling.
Hazards from Combustion Products:	Incomplete combustion will generate highly poisonous carbon monoxide and perhaps other toxic vapors. Propylene Oxide releases flammable vapors below normal ambient temperatures. When mixed with air and exposed to a source of ignition. It can burn in the open or explode if confined. Flammable vapors may be heavier than air, and may travel long distances along the ground before igniting and flashing back to the vapor source. Vapor air mixtures are explosive above flash point.
Precautions for Fire Fighters:	Wear NIOSH approved self contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive pressure mode. Fight fires from a safe distance/protected location. Heat may build pressure in a rupture closed containers. If recommended foam is not available, cut off the supply of fuel to the fire, maintain water spray to prevent spreading and allow fire to burn out.
Hazchem Code:	

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Emergency Procedures:	Release of propylene oxide may create fire or explosion hazard. Evacuate all nonessential personnel. Extinguish all ignition sources. Clean up personnel must be equipped with proper protective equipment. Blanket spill with water to reduce vapors. For small spills, absorb liquid with vermiculite and place into containers for later disposal. Do not use clay based absorbents.
Containment and clean up:	

SECTION 7 - HANDLING & STORAGE

Precautions for Safe Handling:	Wear appropriate protective equipment, refer to Section 8.
Conditions for Safe Storage:	Store propylene oxide in a cool, properly ventilated area away from incompatible chemicals, heat, sparks, open flame and strong oxidizing agents. Store only in highly closed containers. Outside or detached storage is preferred.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards:	OSHA PEL 8 HR TWA: 100ppm (240mg/m ³) TLV-TWA: 20ppm (50mg/m ³)
Biological Limit Values:	No biological limit allocated.
Engineering Controls:	VENTILATION: Install and operate general and local ventilation systems powerful enough to maintain airborne levels of propylene oxide below the PEL (20ppm 8 hr TWA). Ventilation equipment must be explosion proof. SAFETY STATIONS: Emergency eyewash stations and safety showers should be available in all areas of use and handling
Personal Protective Equipment:	EYE PROTECTION: Eye protection, including splash proof goggles and face shield, must always be worn when the possibility exists for eye contact due to splashing or sprayed liquid. Do not wear contact lenses. RESPIRATOR: Where the potential exists for exposures over 20ppm, use a MHA/NIOSH approved, supplied air respirator with full face piece or use a NSHA/NIOSH approved self containing breathing apparatus (SCBA) operated in positive pressure mode. Air purifying respirators are ineffective and must not be used. OTHER: When handling propylene oxide, wear an impervious protective suite, in addition to gloves, boots and full head and face protection. The equipment must be thoroughly cleaned after each use.

SECTION 9 - PHYSICAL & CHEMICAL PROPERTIES

Appearance:	Clear colourless liquid.
Odour:	A sweet ether like odour, 35 ppm

pH:	Not applicable.
Vapour pressure:	455°C mm Hg
Vapour density:	2.0 at (AIR=1)
Boiling point/range:	34.2°C
Freezing/melting point:	-111.7°C
Solubility:	39.5% @ 20°C
Specific gravity or density:	0.824@3.89°C
Flash Point:	Tag Open Cup: <-37.2°C Tag Closed Cup: -37.2°C
Flammable (explosive) limits:	LOWER: 1.7% UPPER: 38.5%
Ignition temperature:	AUTO IGNITION TEMP.: 465°C IGNITION TEMP.: 449°C
Additional Information:	Molecular Weight: 58.08 grams/mole Percent Volatiles by Vol: 100% Evaporation rate: 33.70 Butyl Acetate=1

SECTION 10 - STABILITY AND REACTIVITY

Chemical stability:	Stable under normal storage and handling conditions.
Conditions to avoid:	Contact with incompatible chemicals. Prevent exposure to any and all sources of ignition such as heat, sparks, open flame, etc. Avoid oxidizing conditions.
Incompatible Materials:	Strong acids, bases, peroxides, clay-based adsorbent materials anhydrous metal chlorides, copper and its alloys, brass, bronze and other acetylide forming metals.
Hazardous Decomposition Products:	May polymerize on exposure to excessive heat, peroxides, acids, alkalis, or amines.
Hazardous Reactions:	

SECTION 11 - TOXICOLOGICAL INFORMATION

Acute and chronic health effects:	LD50: 1140 mg/kg, Rat-Oral LC50 (4 HOUR): 4000ppm Rat-Inh
Possible routes of exposure:	Inhalation, skin or eye contact, skin absorption, ingestion
Range of effects following exposure:	Acute: SKIN CONTACT: Propylene oxide in contact with the skin may cause severe skin irritation and blistering. May cause burns, ulcers and superficial scarring with prolonged contact. SKIN ABSORPTION: Propylene oxide in liquid or solution form may be absorbed through the skin and produce toxic effects. Repeated exposure can result in significant skin absorption. EYE CONTACT: Propylene oxide splashed in the eye can cause severe burning, tearing, redness, swelling and corneal burns. Propylene oxide vapors can also cause severe eye irritation. INHALATION: Excessive inhalation of vapors can cause nasal and respiratory irritation, central nervous system depression, including dizziness, weakness, fatigue, nausea, headache, possible unconsciousness and even death. INGESTION: Ingestion of propylene oxide can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration of propylene oxide into the lungs can cause pneumonitis which can be fatal. Chronic: SKIN CONTACT: Repeated or prolonged exposure may cause delayed secondary burns. May cause heritable genetic damage. May cause cancer. EYE CONTACT: No data on chronic effects is available. INHALATION: Studies on animals have shown chronic effects such as growth depression, pulmonary edema, lung and liver injury and death. INGESTION: Studies on animals have shown chronic effects such as loss of body weight, gastric irritation and liver injury. IRRITANCY OF MATERIAL: Severe irritant.
Dose likely to cause injury:	
Delayed effects:	TETROGENICITY: No tetratogenic effects have been reported.

Relevant negative data:

REPRODUCTIVE TOXICITY: Reproductive effects have been shown in experimental animals exposed to propylene oxide.
 MUTAGENICITY: DNA damage and chromosomal aberrations have been shown in experimental animals exposed to propylene oxide.
 OSHA: Not classified.
 ACGIH: Not classified.
 NTP: Classified as anticipated human carcinogen.
 IARC: Classified as probable human carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity:
Persistence and degradability:
Mobility:
Additional Information:

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal Methods: DISPOSAL METHODS: Contaminated solids should be landfilled only at properly permitted disposal sites using registered contractors. Concentrated liquid waste may be incinerated (if safety precautions are taken because of very low flash point) in compliance with applicable air pollution control regulations. It is recommended that contaminated product, soil or water intended for disposal be handled as hazardous waste due to potentially low flashpoint. Disposal should be in accordance with applicable local, State and Federal regulations.

Special Precautions:

SECTION 14 - TRANSPORT INFORMATION

UN Number: UN 1280
UN Proper Shipping Name: Propylene Oxide
Class and Subsidiary risk: 3
Packing Group: I
Special Precautions for User: Preplan handling and emergency response procedures prior to use. Protect containers from physical damage and regularly inspect them for cracks, leaks or faulty valves. Use only non sparking tools and equipment when opening and closing containers. Container and system must be electrically grounded before unloading. Dry inert gas blanketing should be used to reduce possibility of flammable vapor mixtures in storage. Store in accordance with 29 CFR 1910.106.

Hazchem Code:

SECTION 15 - REGULATORY INFORMATION

Poison Schedule Number: None allocated

SECTION 16 - OTHER INFORMATION

Date of preparation of MSDS: April 2009

The information published in this Material Safety Data Sheet has been compiled from data in various technical publications. It is the user's responsibility to determine the suitability of this information for adoption of necessary safety precautions. We reserve the right to revise material Safety Data Sheets as new information becomes available. Copies may be made for non-profit use.