

MATERIAL SAFETY DATA SHEET



Bayer MaterialScience

Bayer MaterialScience LLC
Product Safety & Regulatory Affairs
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TRANSPORTATION EMERGENCY

CALL CHEMTREC: (800) 424-9300
INTERNATIONAL: (703) 527-3887

NON-TRANSPORTATION

Bayer Emergency Phone: Call Chemtrec
Bayer Information Phone: (800) 662-2927

1. Product and Company Identification

Product Name: PROPYLENE OXIDE
Material Number: 3890132
Chemical Family: Epoxy
Chemical Name: Methyl Oxirane

2. Hazards Identification

Emergency Overview

DANGER! Color: Colorless **Form:** liquid **Odor:** sweet.
Extremely flammable. Extreme risk of explosion by shock, friction, fire or other sources of ignition. Harmful by inhalation. Irritating to respiratory system. Harmful in contact with skin. Irritating to skin. Irritating to eyes. Harmful if swallowed. May cause cancer. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Vapors may travel to areas away from work site before igniting/flashing back to vapor source. Closed container may forcibly rupture under extreme heat. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture. Toxic gases/fumes may be given off during burning or thermal decomposition. May affect nervous system.

Potential Health Effects

Primary Routes of Entry: Skin Contact, Eye Contact, Ingestion, Inhalation

Medical Conditions Aggravated by Exposure: Skin disorders, Respiratory disorders, Eye disorders

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE

Acute Inhalation

For Component: Propylene Oxide

Causes respiratory tract irritation with symptoms of coughing, sore throat and runny nose. May cause nervous system effects which can include symptoms of dizziness, incoordination, headache, numbness, and/or confusion. Harmful by inhalation

Chronic Inhalation

Material Name: PROPYLENE OXIDE

Article Number: 3890132

For Component: Propylene Oxide

May cause lung damage.

Skin

Acute Skin

For Component: Propylene Oxide

Moderately toxic by skin absorption. Causes irritation with symptoms of reddening, itching, and swelling. If sufficient amounts are absorbed, systemic toxicity may occur with symptoms similar to those described in acute inhalation. May cause allergic skin reaction with symptoms of reddening, itching, swelling, and rash.

Eye

Acute Eye

For Component: Propylene Oxide

Causes irritation with symptoms of reddening, tearing, stinging, and swelling. May cause corneal injury.

Acute Ingestion

For Component: Propylene Oxide

Toxic by ingestion. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea. May cause nervous system effects which can include symptoms of dizziness, incoordination, headache, numbness, and/or confusion.

Chronic Ingestion

For Component: Propylene Oxide

May cause nervous system damage with symptoms of numbness, incoordination, headache, and confusion.

Other Effects of Exposure

For Product: PROPYLENE OXIDE

May cause heritable genetic damage. May cause cancer.

Carcinogenicity:

Propylene Oxide

NTP - Hazard Designation: Anticipated carcinogen.

IARC - Overall evaluation: 2B Possible carcinogen.

3. Composition/Information on Ingredients

Hazardous Components

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

4. First Aid Measures

Eye Contact

Immediately flush eye(s) with plenty of water. Use lukewarm water if possible. Use fingers to ensure that eyelids are separated and that the eye is being irrigated. Take victim immediately to hospital. Continue rinsing eyes during transport to hospital.

Skin Contact

Immediately remove contaminated clothing and shoes. Wash off immediately with plenty of water for at least 15 minutes. Wash with water and soap as a precaution. Get medical attention immediately if irritation develops and persists. Thoroughly clean shoes before reuse. Wash clothing before reuse.

Inhalation

If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Take victim immediately to hospital.

Ingestion

If ingested, do not induce vomiting unless directed to do so by medical personnel. Take victim immediately to hospital.

Additional Advice

Ensure first responders/ medical personnel are wearing appropriate PPE to prevent contact. Get medical attention immediately.

Notes to physician

Contact a Poison Control Center or toxicologist for guidance. Treat symptomatically. Following cases of gross over-exposure, investigation of liver, kidney and eye function may be advisable. Records of such incidents should be maintained for future reference. Artificial respiration may be required.

5. Fire-Fighting Measures

Suitable Extinguishing Media: alcohol-resistant foam, water spray, Water fog, dry chemical, carbon dioxide (CO₂), dry sand

Unsuitable Extinguishing Agents: Do NOT use water jet.

Special Fire Fighting Procedures

Firefighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes. Use cold water spray to cool fire-exposed containers to minimize the risk of rupture.

Unusual Fire/Explosion Hazards

Flammable Liquid. Vapors may spread long distances and ignite. Vapors or mist may be a fire and explosion hazard when exposed to high temperature or ignition. Burning liquid may float on water. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition.

6. Accidental release measures**Spill and Leak Procedures**

Evacuate and keep unnecessary people out of spill area. Cleanup personnel must use appropriate personal protective equipment. Remove all sources of ignition, including flames, heat, and sparks. Use grounded or non-sparking tools and equipment. Keep upwind of the spill area. Dike or dam spilled material and control further spillage, if possible. Do not allow spilled material or wash water to enter sewers, surface waters, or groundwater systems. Cover spill with inert material (e. g., dry sand or earth) and collect for proper disposal. Allow to evaporate. Wash spill area with soap and water.

7. Handling and Storage

Storage Temperature:
maximum: 30 °C (86 °F)

Handling/Storage Precautions

Keep away from heat, sparks and open flames. Ground and bond containers and equipment before

transferring to avoid static sparks. Do not breathe vapours or spray mist. Avoid contact with eyes. Avoid contact with skin or clothing. Use only with adequate ventilation/personal protection. Wash thoroughly after handling. Keep container closed when not in use.

Further Info on Storage Conditions

Keep away from heat, sparks and open flames. Use spark-proof tools and explosion-proof equipment. Store separate from food products. Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200. Avoid extreme heat.

8. Exposure Controls / Personal Protection

Propylene Oxide (75-56-9)

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 2 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

PEL: 100 ppm, 240 mg/m³

US. ACGIH Threshold Limit Values

Hazard Designation: Sensitiser.

US. ACGIH Threshold Limit Values

Hazard Designation: Group A3 Confirmed animal carcinogen with unknown relevance to humans.

Industrial Hygiene/Ventilation Measures

General dilution and local exhaust as necessary to control airborne vapors, mists, dusts and thermal decomposition products below appropriate airborne concentration standards/guidelines. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental contamination. Curing ovens must be ventilated to prevent the build up of explosive atmospheres and to prevent off gases from entering the work place.

Respiratory Protection

A NIOSH approved air purifying respirator with organic vapor cartridges and particulate prefilter can be used to minimize exposure., A NIOSH approved positive pressure air-supplied respirator is required whenever airborne concentrations are not known or exceed the recommended exposure limit., The type of respiratory protection selected must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected the airborne concentration must be no greater than 10 times the TLV or PEL. For spray applications, a combination particulate/organic vapor (P95/OV) cartridge is recommended. If exposure to oven off-gases is expected, use of a positive pressure or continuous flow SAR is recommended.

Hand Protection

Permeation resistant gloves., silver shield under gauntlet type nitrile rubber gloves

Eye Protection

Chemical resistant goggles must be worn., Chemical safety goggles in combination with a full face shield if a splash hazard exists.

Skin and body protection

Permeation resistant clothing, Gloves, long sleeved shirts and pants.

Additional Protective Measures

Employees should wash their hands and face before eating, drinking, or using tobacco products. Educate and train employees in the safe use and handling of this product. Emergency showers and eye wash stations should be available.

9. Physical and chemical properties

Form:	liquid
Color:	Colorless
Odor:	sweet
Freezing Point:	-111.9 °C (-169.42 °F)
Boiling Point/Range:	34.2 °C (93.56 °F)
Flash Point:	-37 °C (-34.6 °F) (Tagliabue Closed Cup (ASTM D-56))
Lower Explosion Limit:	2.3 %(V)
Upper Explosion Limit:	37 %(V)
Vapor Pressure:	25 kPa @ 0 °C (32 °F) 57.7 kPa @ 20 °C (68 °F)
Specific Gravity:	0.824 @ 3.89 °C (39 °F)
Solubility in Water:	405 kg/m ³ @ 20 °C (68 °F)
Partition Coefficient (n-octanol/water):	logPow: 0.03
Autoignition Temperature:	430 °C (806 °F)
Viscosity, Dynamic:	0.58 mPa.s @ 20 °C (68 °F)
Bulk Density:	830 kg/m ³ @ 20 °C (68 °F)

10. Stability and Reactivity

Hazardous Reactions

Material will polymerise at elevated temperatures 122 F (50 C) or if contaminated with water. Reacts with strong oxidising agents. Reacts with strong acids.

Stability

Stable under normal conditions of use and storage.

Materials to avoid

bases, Ammonia, Water, acids, heavy metals, alkali metals, strong oxidizing agents, copper, copper alloys, Clay-based absorbents, primary and secondary amines, alkali metal hydroxides, anhydrous chlorides of aluminium

Conditions to avoid

Heat, flames, and sparks. Prevent vapour accumulation. Temperatures above 30 C (86 F).

Hazardous decomposition products

By Fire and Thermal Decomposition: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke, Isocyanate, Isocyanic Acid and other undetermined compounds., Other undetermined compounds

11. Toxicological Information

Toxicity Data for Propylene Oxide

Acute Oral Toxicity

LD50: 380 mg/kg (rat)

Acute Inhalation Toxicity

LC50: 9.486 mg/l, 4 hrs (rat)

Acute dermal toxicity

LD50: 1,244 mg/kg (rabbit)

Skin Irritation

rabbit, Severely irritating

Eye Irritation

rabbit, Severely irritating

Sensitization

non-sensitizer (guinea pig)

dermal: sensitizer (Human, Patch Test)

Repeated Dose Toxicity

13 weeks, Inhalation: NOAEL: 0.363 mg/l, (rat, Male/Female, 6 hrs/day 5 days/week)

14 Days, Inhalation: NOAEL: 1.173 mg/l, (rat, Male/Female, 6 hrs/day 5 days/week)

Mutagenicity

Genetic Toxicity in Vitro:

Ames: positive (Salmonella typhimurium, Metabolic Activation: with/without)

Genetic Toxicity in Vivo:

Dominant Lethal Assay: negative (mouse, male, oral)

Drosophila SLRL test: positive (Drosophila melanogaster, male, inhalation)

Sister Chromatid Exchange: negative (Monkey, male, inhalation)

Positive and negative results were seen in various in vivo studies.

Carcinogenicity

rat, Male/Female, inhalation, 124 weeks, 6 hrs/day 5 days/week

ambiguous

mouse, Male/Female, inhalation, 124 weeks, 6 hrs/day 5 days/week

positive

rat, oral,

positive

Toxicity to Reproduction/Fertility

Fertility Screening, oral, (rat, male) NOAEL (parental): < 520 mg/kg,

Reproductive effects have been observed in animal studies.

Two generation study, inhalation, 6 hrs/day 5 days/week, (rat, Male/Female) NOAEL (parental): 0.726 mg/l, NOAEL (F1): 0.726 mg/l,

No effects on Reproductive parameters observed at doses tested.

Developmental Toxicity/Teratogenicity

rat, female, inhalation, gestation, 6 hrs/day 7 days/week, NOAEL (teratogenicity): 1.205 mg/kg, NOAEL (maternal): 0.723 mg/l,

No Teratogenic effects observed at doses tested.

rabbit, female, inhalation, NOAEL (teratogenicity): 1.210 mg/l, NOAEL (maternal): < 1.210 mg/l,

Fetotoxicity has been observed in animal studies.

Causes fetotoxicity at doses which are maternally toxic.

12. Ecological Information

Ecological Data for Propylene Oxide

Biodegradation

aerobic, 12 - 14 %, Exposure time: 28 Days

Biological Oxygen Demand (BOD)

350 mg/g (15.8 % ThOD)

Chemical Oxygen Demand (COD)

2,000 mg/g (90 % ThOD)

Theoretical Biological Oxygen Demand (ThBOD)

0.176

Bioaccumulation

< 1.09 BCF

Calculated value

Acute and Prolonged Toxicity to Fish

LC50: 52 mg/l (Rainbow trout (*Salmo gairdneri*), 96 hrs)

LC50: 141 mg/l (Mosquitofish (*Gambusia affinis*), 96 hrs)

LC50: 89 mg/l (Other marine species, 96 hrs)

Acute Toxicity to Aquatic Invertebrates

EC50: 350 mg/l (Water flea (*Daphnia magna*), 48 hrs)

Toxicity to Aquatic Plants

EC50: 240 mg/l, End Point: growth (Green algae (*Selenastrum capricornutum*), 96 hrs)

Toxicity to Microorganisms

EC50: 3,300 mg/l, (Other bacteria, 160 min)

13. Disposal considerations

Waste Disposal Method

Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Empty Container Precautions

Do not heat or cut container with electric or gas torch. Recondition or dispose of empty container in accordance with governmental regulations. Do not reuse empty container without proper cleaning. Label precautions also apply to this container when empty.

14. Transportation information

Land transport (DOT)

Proper Shipping Name: Propylene oxide

Hazard Class or Division: 3

UN/NA Number: UN1280

Packaging Group: I

Hazard Label(s): Flammable Liquid

Material Name: PROPYLENE OXIDE

Article Number: 3890132

RSPA/DOT Regulated Components:

Propylene Oxide

Reportable Quantity: 45 kg

Sea transport (IMDG)

Proper Shipping Name: PROPYLENE OXIDE

Hazard Class or Division: 3

UN-No: UN1280

Packaging Group: I

Hazard Label(s): Flammable liquids

Air transport (ICAO/IATA)

Proper Shipping Name: Propylene oxide

Hazard Class or Division: 3

UN-No: UN1280

Packaging Group: I

Hazard Label(s): Flammable liquids

15. Regulatory Information

United States Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US. Toxic Substances Control Act: Listed on the TSCA Inventory.

US. EPA CERCLA Hazardous Substances (40 CFR 302):

Components

Propylene Oxide Reportable quantity: 100 lbs

SARA Section 311/312 Hazard Categories:

Acute Health Hazard, Chronic Health Hazard, Fire Hazard

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

Components

Propylene Oxide

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components

Propylene Oxide

US. EPA Resource Conservation and Recovery Act (RCRA) Composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):

When discarded in its purchased form, this product meets the criteria of ignitability, and should be managed as a hazardous waste (EPA Hazardous Waste Number D001). (40 CFR 261.20-24)

State Right-To-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

New Jersey Environmental Hazardous Substances List and/or New Jersey RTK Special Hazardous Substances Lists:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

Pennsylvania Right to Know Special Hazard Substance List:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

MA Right to Know Extraordinarily Hazardous Substance List:

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

California Prop. 65:

Warning! This product contains chemical(s) known to the State of California to be Carcinogenic.

<u>Weight %</u>	<u>Components</u>	<u>CAS-No.</u>
100%	Propylene Oxide	75-56-9

16. Other Information

NFPA 704M Rating

Health	3
Flammability	4
Reactivity	2
Other	

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

HMIS Rating

Health	2*
Flammability	4
Physical Hazard	2

0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

* = Chronic Health Hazard

The method of hazard communication for Bayer MaterialScience LLC is comprised of Product Labels and Material Safety Data Sheets. HMIS and NFPA ratings are provided by Bayer MaterialScience LLC as a customer service.

Contact Person: Product Safety Department
Telephone: (412) 777-2835
MSDS Number: 000000006585
Version Date: 04/09/2009
Report Version: 1.6

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