PROPYLENE OXIDE

POX

CAUTIONARY RESPONSE INFORMATION

Common Synonyms			
1,2-Epoxypropane Methyloxirane Propeneoxide	Liquid	Colorless	Sweet, alcohol odor

Mixes with water. Flammable, irritating vapor is produced.

Evacuate.
Keep people away. AVOID CONTACT WITH LIQUID AND VAPOR.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Shut off ignition sources and call fire department.
Stay upwind and use water spray to ``knock down'' vapor.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

FLAMMABLE.
Containers may explode in fire.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Combat fires from safe distance or protected location.
Extinguish with dry chemical, alcohol foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose, and throat.
If inhaled, will cause headache, nausea, vomiting, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Do not burn

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 16; Alkylene oxide
2.2 Formula: CH_3CHCH_2O
2.3 IMO/UN Designation: 3.1/1280
2.4 DOT ID No.: 1280
2.5 CAS Registry No.: 75-56-9
2.6 NAERG Guide No.: 127P
2.7 Standard Industrial Trade Classification: 51614

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Air-supplied mask; rubber or plastic gloves; vapor-proof goggles.
3.2 Symptoms Following Exposure: Inhalation may produce headache, nausea, vomiting, and unconsciousness; mild depression of central nervous system; lung irritation. Slightly irritating to skin, but covered contact may cause burn. Very irritating to eyes.
3.3 Treatment of Exposure: INHALATION: remove person to fresh air immediately, keep quiet and warm; call a physician; if breathing stops, start artificial respiration. SKIN OR EYE CONTACT: immediately flush with plenty of water for at least 15 min.; immediately remove contaminated clothing, watch bands, rings, etc. to prevent confining product to skin; for eyes get medical attention.
3.4 TLV-TWA: 20 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 2; LD_{50} = 0.5 to 5 g/kg (rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations.
3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure.
3.12 Odor Threshold: 200 ppm
3.13 IDLH Value: 400 ppm
3.14 OSHA PEL-TWA: 100 ppm
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: –35°F C.C.; <–20°F O.C.
4.2 Flammable Limits in Air: 2.1%-38.5%
4.3 Fire Extinguishing Agents: Carbon dioxide or dry chemical for small fires; alcohol or polymer foam for large fires.
4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Containers may explode. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.
4.7 Auto Ignition Temperature: 869°F
4.8 Electrical Hazards: Class I, Group B (C)
4.9 Burning Rate: 3.3 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 19.0 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 6.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): N_2 diluent: 7.8%

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: No reaction
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: May occur due to high temperatures, contamination with alkalies, aqueous acids, amines, and acidic alcohols.
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 1
Human Contact hazard: II
Reduction of amenities: X

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99.99% (must contain no acetylene)
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: Inerted
7.4 Venting: Safety relief
7.5 IMO Pollution Category: C
7.6 Ship Type: 2
7.7 Barge Hull Type: 2

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Flammable liquid
8.2 49 CFR Class: 3
8.3 49 CFR Package Group: I
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	3
Flammability (Red).....	4
Instability (Yellow).....	2

8.6 EPA Reportable Quantity: Not listed.
8.7 EPA Pollution Category: Not listed.
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Liquid
9.2 Molecular Weight: 58.08
9.3 Boiling Point at 1 atm: 93.7°F = 34.3°C = 307.5°K
9.4 Freezing Point: –169.4°F = –111.9°C = 161.3°K
9.5 Critical Temperature: 408.4°F = 209.1°C = 482.3°K
9.6 Critical Pressure: 714 psia = 48.6 atm = 4.92 MN/m^2
9.7 Specific Gravity: 0.830 at 20°C (liquid)
9.8 Liquid Surface Tension: 24.5 dynes/cm = 0.0245 N/m at 15°C
9.9 Liquid Water Interfacial Tension: Not pertinent
9.10 Vapor (Gas) Specific Gravity: 2.0
9.11 Ratio of Specific Heats of Vapor (Gas): 1.133
9.12 Latent Heat of Vaporization: 205 Btu/lb = 114 cal/g = 4.77 X 10^5 J/kg 4.77 X 10^5 J/kg
9.13 Heat of Combustion: –13,000 Btu/lb = –7,221 cal/g = –302.3 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: (est.) –19 Btu/lb = –11 cal/g = –0.45 X 10^5 J/kg
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 18.0 psia

NOTES

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9.20 SATURATED LIQUID DENSITY

Temperature (degrees F)	Pounds per cubic foot
-35	56.390
-30	56.170
-25	55.940
-20	55.720
-15	55.490
-10	55.270
-5	55.040
0	54.810
5	54.591
10	54.360
15	54.140
20	53.910
25	53.690
30	53.460
35	53.240
40	53.010
45	52.791
50	52.560
55	52.330
60	52.110
65	51.880
70	51.660
75	51.430
80	51.210
85	50.980
90	50.760

9.21 LIQUID HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
0	0.433
10	0.445
20	0.457
30	0.469
40	0.482
50	0.494
60	0.506
70	0.518
80	0.531
90	0.543

9.22 LIQUID THERMAL CONDUCTIVITY

Temperature (degrees F)	British thermal unit inch per hour-square foot-F
	NOT PERTINENT

9.23 LIQUID VISCOSITY

Temperature (degrees F)	Centipoise
	NOT PERTINENT

9.24 SOLUBILITY IN WATER

Temperature (degrees F)	Pounds per 100 pounds of water
68	40.500

9.25 SATURATED VAPOR PRESSURE

Temperature (degrees F)	Pounds per square inch
-50	0.207
-40	0.318
-30	0.474
-20	0.691
-10	0.983
0	1.371
10	1.875
20	2.521
30	3.337
40	4.353
50	5.601
60	7.118
70	8.941
80	11.110
90	13.670
100	16.660
110	20.130
120	24.120
130	28.680
140	33.860
150	39.710

9.26 SATURATED VAPOR DENSITY

Temperature (degrees F)	Pounds per cubic foot
-50	0.00274
-40	0.00410
-30	0.00598
-20	0.00850
-10	0.01183
0	0.01613
10	0.02160
20	0.02844
30	0.03687
40	0.04713
50	0.05946
60	0.07411
70	0.09133
80	0.11140
90	0.13450
100	0.16100
110	0.19110
120	0.22510
130	0.26320
140	0.30550
150	0.35240

9.27 IDEAL GAS HEAT CAPACITY

Temperature (degrees F)	British thermal unit per pound-F
0	0.257
25	0.270
50	0.283
75	0.296
100	0.308
125	0.320
150	0.332
175	0.344
200	0.355
225	0.366
250	0.377
275	0.388
300	0.398
325	0.409
350	0.419
375	0.429
400	0.438
425	0.448
450	0.457
475	0.466
500	0.475
525	0.484
550	0.492
575	0.501
600	0.509