

# EPICHLOROHYDRIN

EPC

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b> 1-Chloro-2,3-epoxypropane Chloromethyloxirane 3-Chloro-1, 2-propylene oxide gamma-Chloropropylene oxide		Watery liquid      Colorless      Sweet garlic odor  Sinks and mixes with water. Poisonous, flammable vapor is produced.
Keep people away. AVOID CONTACT WITH LIQUID AND VAPOR. Avoid inhalation. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies. Protect water intakes.		
<b>Fire</b>	Combustible. POISONOUS GASES ARE PRODUCED IN FIRE. 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 water, dry chemical, alcohol foam or carbon dioxide. Cool exposed containers with water.	
<b>Exposure</b>	CALL FOR MEDICAL AID.  VAPOR POISONOUS IF INHALED. Irritating to eyes. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.  LIQUID POISONOUS IF SWALLOWED. Will burn skin and eyes. 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 or milk, and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.	
<b>Water Pollution</b>	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:** 17;  
 Epichlorohydrin  
 2.2 **Formula:** O'CH<sub>2</sub>CHCH<sub>2</sub>Cl  
 2.3 **IMO/UN Designation:** 6.1/2023  
 2.4 **DOT ID No.:** 2023  
 2.5 **CAS Registry No.:** 106-89-8  
 2.6 **NAERG Guide No.:** 131P  
 2.7 **Standard Industrial Trade Classification:**  
 51615

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Air pack or organic canister mask; protective gloves and goggles.  
 3.2 **Symptoms Following Exposure:** Vapor is irritating to eyes, nose, and throat; may cause headache, nausea, vomiting, and central nervous system depression. Rapidly fatal if swallowed, i.e., nausea, vomiting, and collapse. Skin contact is irritating.  
 3.3 **Treatment of Exposure:** INHALATION: remove victim to fresh air, keep him warm and quiet, and get medical attention immediately; if breathing stops, start artificial respiration. INGESTION: induce vomiting (but only if victim is conscious and without convulsions) and call a physician promptly; no specific antidote known. EYES OR SKIN: immediately flush with water for at least 15 min. and get medical attention; remove contaminated clothing and wash before reuse.  
 3.4 **TLV-TWA:** 0.5 ppm  
 3.5 **TLV-STEL:** Not listed.  
 3.6 **TLV-Ceiling:** Not listed.  
 3.7 **Toxicity by Ingestion:** Grade 3; LD<sub>50</sub> = 50 to 500 mg/kg  
 3.8 **Toxicity by Inhalation:** Currently not available.  
 3.9 **Chronic Toxicity:** Causes cancer in experimental animals.  
 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:** Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes' contact.  
 3.12 **Odor Threshold:** 10 ppm  
 3.13 **IDLH Value:** 75 ppm  
 3.14 **OSHA PEL-TWA:** 5 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:** 92°F O.C. 100°F C.C.  
 4.2 **Flammable Limits in Air:** 3.8%-21.0%  
 4.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, carbon dioxide, water spray  
 4.4 **Fire Extinguishing Agents Not to Be Used:** Avoid use of dry chemical if fire occurs in container with confined vent.  
 4.5 **Special Hazards of Combustion Products:** Toxic, irritating vapors are generated when heated.  
 4.6 **Behavior in Fire:** Containers may explode in fire because of polymerization.  
 4.7 **Auto Ignition Temperature:** 772°F  
 4.8 **Electrical Hazards:** Not pertinent  
 4.9 **Burning Rate:** 2.6 mm/min.  
 4.10 **Adiabatic Flame Temperature:** Currently not available  
 4.11 **Stoichiometric Air to Fuel Ratio:** 16.7 (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):** Not listed

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 99.0%  
 7.2 **Storage Temperature:** Ambient  
 7.3 **Inert Atmosphere:** No requirement  
 7.4 **Venting:** Pressure-vacuum  
 7.5 **IMO Pollution Category:** A  
 7.6 **Ship Type:** 2  
 7.7 **Barge Hull Type:** 1

### 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison  
 8.2 **49 CFR Class:** 6.1  
 8.3 **49 CFR Package Group:** II  
 8.4 **Marine Pollutant:** No  
 8.5 **NFPA Hazard Classification:**  

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

 8.6 **EPA Reportable Quantity:** 100 pounds  
 8.7 **EPA Pollution Category:** B  
 8.8 **RCRA Waste Number:** U041  
 8.9 **EPA FWP/CA List:** Yes

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Mild reaction; not likely to be hazardous.  
 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:** Can polymerize in presence of strong acids and bases, particularly when hot.  
 5.6 **Inhibitor of Polymerization:** None used

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid  
 9.2 **Molecular Weight:** 92.53  
 9.3 **Boiling Point at 1 atm:** 239.4°F = 115.2°C = 388.4°K  
 9.4 **Freezing Point:** -72.6°F = -58.1°C = 215.1°K  
 9.5 **Critical Temperature:** Not pertinent  
 9.6 **Critical Pressure:** Not pertinent  
 9.7 **Specific Gravity:** 1.18 at 20°C (liquid)  
 9.8 **Liquid Surface Tension:** 37.0 dynes/cm = 0.037 N/m at 20°C  
 9.9 **Liquid Water Interfacial Tension:** Not pertinent  
 9.10 **Vapor (Gas) Specific Gravity:** Not pertinent  
 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.155  
 9.12 **Latent Heat of Vaporization:** 176 Btu/lb = 97.9 cal/g = 4.10 X 10<sup>5</sup> J/kg  
 9.13 **Heat of Combustion:** -8143 Btu/lb = -4524 cal/g = -189.4 X 10<sup>5</sup> J/kg  
 9.14 **Heat of Decomposition:** Not pertinent  
 9.15 **Heat of Solution:** Not pertinent  
 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:** 0.67

### NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
40	74.750	15	0.311	0	0.469	35	1.516
50	74.309	20	0.314	10	0.474	40	1.444
60	73.879	25	0.316	20	0.478	45	1.376
70	73.440	30	0.319	30	0.483	50	1.312
80	73.000	35	0.321	40	0.487	55	1.252
90	72.559	40	0.324	50	0.492	60	1.197
100	72.120	45	0.326	60	0.496	65	1.144
110	71.679	50	0.329	70	0.501	70	1.095
120	71.240	55	0.331	80	0.505	75	1.049
130	70.799	60	0.334	90	0.510	80	1.006
140	70.360	65	0.336	100	0.514	85	0.965
150	69.910	70	0.339	110	0.519	90	0.927
160	69.469	75	0.341	120	0.523	95	0.890
170	69.020	80	0.344	130	0.528	100	0.856
180	68.570	85	0.346	140	0.532		
190	68.120	90	0.349	150	0.537		
200	67.679	95	0.351	160	0.541		
210	67.230	100	0.354	170	0.545		
220	66.770	105	0.356	180	0.550		
230	66.320	110	0.359	190	0.554		
		115	0.361	200	0.559		
		120	0.364	210	0.563		
		125	0.366				
		130	0.369				
		135	0.371				
		140	0.374				

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
77	6.000	20	0.044	20	0.00079	0	0.136
		30	0.065	30	0.00114	25	0.145
		40	0.094	40	0.00161	50	0.154
		50	0.133	50	0.00226	75	0.162
		60	0.188	60	0.00311	100	0.170
		70	0.261	70	0.00424	125	0.178
		80	0.358	80	0.00572	150	0.185
		90	0.486	90	0.00762	175	0.192
		100	0.652	100	0.01004	200	0.199
		110	0.866	110	0.01310	225	0.206
		120	1.139	120	0.01693	250	0.212
		130	1.484	130	0.02169	275	0.218
		140	1.916	140	0.02755	300	0.223
		150	2.455	150	0.03471	325	0.228
		160	3.119	160	0.04339	350	0.233
		170	3.933	170	0.05385	375	0.238
		180	4.924	180	0.06636	400	0.242
		190	6.123	190	0.08123	425	0.246
		200	7.562	200	0.09881	450	0.250
		210	9.281	210	0.11950	475	0.254
						500	0.257
						525	0.259
						550	0.262
						575	0.264
						600	0.265