

TRICHLOROETHANE

TCE

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Aerothene Chloroethene Methylchloroform 1,1,1-Trichloroethane	Watery liquid Colorless Sweet odor Sinks in water. Irritating vapor is produced.
<p>Keep people away. Avoid contact with liquid and vapor. Call fire department. Notify local health and pollution control agencies. Protect water intakes.</p>	
Fire	Combustible. POISONOUS GASES ARE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. Extinguish with dry chemical, carbon dioxide, or foam.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled, will cause dizziness or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Irritating to skin and eyes. If swallowed, may produce nausea. 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.
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	2. CHEMICAL DESIGNATIONS
Stop discharge Contain Collection Systems: Pump Do not burn	2.1 CG Compatibility Group: 36; Halogenated hydrocarbon 2.2 Formula: CH ₂ CCl ₃ 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: 2831 2.5 CAS Registry No.: 71-55-6 2.6 NAERG Guide No.: 160 2.7 Standard Industrial Trade Classification: 51134
3. HEALTH HAZARDS	
<p>3.1 Personal Protective Equipment: Organic vapor-acid gas canister; self-contained breathing apparatus for emergencies; neoprene or polyvinyl-alcohol-type gloves; chemical safety goggles and face shield; neoprene safety shoes (or leather safety shoes plus neoprene footwear); neoprene or polyvinyl alcohol suit or apron for splash protection.</p> <p>3.2 Symptoms Following Exposure: INHALATION: symptoms range from loss of equilibrium and incoordination to loss of consciousness; high concentration can be fatal due to simple asphyxiation combined with loss of consciousness. INGESTION: produces effects similar to inhalation and may cause some feeling of nausea. EYES: slightly irritating and lacrimation. SKIN: defatting action may cause dermatitis.</p> <p>3.3 Treatment of Exposure: Get medical attention for all eye exposures and any other serious over-exposures. Do NOT administer adrenaline or epinephrine; otherwise, treatment is symptomatic. INHALATION: remove victim to fresh air; if necessary, apply artificial respiration and/or administer oxygen. INGESTION: have victim drink water and induce vomiting. EYES: flush thoroughly with water. SKIN: remove contaminated clothing and wash exposed area thoroughly with soap and warm water.</p> <p>3.4 TLV-TWA: 350 ppm</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: 450 ppm</p> <p>3.7 Toxicity by Ingestion: Grade 1; LD₅₀ = 5 to 15 g/kg (rat, mouse, rabbit, guinea pig)</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Currently not available</p> <p>3.10 Vapor (Gas) Irritant Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.</p> <p>3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.</p> <p>3.12 Odor Threshold: 100 ppm</p> <p>3.13 IDLH Value: 700 ppm</p> <p>3.14 OSHA PEL-TWA: 350 ppm</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA AEGL: Not listed</p>	

4. FIRE HAZARDS

- 4.1 Flash Point: Currently not available
- 4.2 Flammable Limits in Air: 7%-16%
- 4.3 Fire Extinguishing Agents: Dry chemical, foam, or carbon dioxide
- 4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
- 4.5 Special Hazards of Combustion Products: Toxic and irritating gases are generated in fires.
- 4.6 Behavior in Fire: Not pertinent
- 4.7 Auto Ignition Temperature: 932°F
- 4.8 Electrical Hazards: Not pertinent
- 4.9 Burning Rate: (est.) 2.9 mm/min.
- 4.10 Adiabatic Flame Temperature: Currently not available
- 4.11 Stoichiometric Air to Fuel Ratio: 9.5 (calc.)
- 4.12 Flame Temperature: Currently not available
- 4.13 Combustion Molar Ratio (Reactant to Product): 5.0 (calc.)
- 4.14 Minimum Oxygen Concentration for Combustion (MOCC): N₂ diluent: 14.0%

5. CHEMICAL REACTIVITY

- 5.1 Reactivity with Water: Reacts slowly, releasing corrosive hydrochloric acid.
- 5.2 Reactivity with Common Materials: Corrodes aluminum, but reaction is not hazardous.
- 5.3 Stability During Transport: Stable
- 5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
- 5.5 Polymerization: Not pertinent
- 5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

- 6.1 Aquatic Toxicity: 75-150 ppm*/pinfish/TL_n/salt water *Time period not specified.
- 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: 0
Reduction of amenities: 0

7. SHIPPING INFORMATION

- 7.1 Grades of Purity: Uninhibited; inhibited; industrial inhibited; white room; cold cleaning
- 7.2 Storage Temperature: Ambient
- 7.3 Inert Atmosphere: No requirement
- 7.4 Venting: Pressure-vacuum
- 7.5 IMO Pollution Category: C
- 7.6 Ship Type: 3
- 7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 49 CFR Category: Keep Away From Food
- 8.2 49 CFR Class: 6.1
- 8.3 49 CFR Package Group: III
- 8.4 Marine Pollutant: Yes
- 8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	1
Instability (Yellow)	0
- 8.6 EPA Reportable Quantity: 1000 pounds
- 8.7 EPA Pollution Category: C
- 8.8 RCRA Waste Number: U226
- 8.9 EPA FWCPC List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15° C and 1 atm: Liquid
- 9.2 Molecular Weight: 133.41
- 9.3 Boiling Point at 1 atm: 165°F = 74°C = 347°K
- 9.4 Freezing Point: <-38°F = <-39°C = <234°K
- 9.5 Critical Temperature: Not pertinent
- 9.6 Critical Pressure: Not pertinent
- 9.7 Specific Gravity: 1.31 at 20°C (liquid)
- 9.8 Liquid Surface Tension: 25.4 dynes/cm = 0.0254 N/m at 20°C
- 9.9 Liquid Water Interfacial Tension: (est.) 45 dynes/cm = 0.045 N/m at 20°C
- 9.10 Vapor (Gas) Specific Gravity: 4.6
- 9.11 Ratio of Specific Heats of Vapor (Gas): 1.104
- 9.12 Latent Heat of Vaporization: 100 Btu/lb = 58 cal/g = 2.4 X 10⁵ J/kg
- 9.13 Heat of Combustion: (est.) 4700 Btu/lb = 2600 cal/g = 110 X 10⁵ 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: 4.0 psia

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
0	85.419	55	0.240		N	15	1.363
10	84.870	60	0.242		T	20	1.295
20	84.309	65	0.244		R	25	1.231
30	83.759	70	0.246		I	30	1.172
40	83.200	75	0.248		N	35	1.117
50	82.650	80	0.250		E	40	1.065
60	82.089	85	0.252		R	45	1.017
70	81.540	90	0.254		T	50	0.972
80	80.981	95	0.256		I	55	0.929
90	80.429	100	0.258		N	60	0.889
100	79.870	105	0.260		E	65	0.852
110	79.320	110	0.262		N	70	0.817
120	78.759	115	0.264		T	75	0.784
130	78.209	120	0.266			80	0.753
140	77.650	125	0.268			85	0.723
150	77.099	130	0.270				
160	76.540	135	0.272				
		140	0.274				

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
68	0.070	70	2.099	70	0.04925	0	0.146
		75	2.364	75	0.05495	25	0.150
		80	2.657	80	0.06119	50	0.155
		85	2.980	85	0.06799	75	0.159
		90	3.335	90	0.07540	100	0.163
		95	3.725	95	0.08346	125	0.167
		100	4.152	100	0.09220	150	0.171
		105	4.619	105	0.10170	175	0.175
		110	5.130	110	0.11190	200	0.179
		115	5.686	115	0.12300	225	0.183
		120	6.292	120	0.13490	250	0.186
		125	6.950	125	0.14770	275	0.190
		130	7.663	130	0.16150	300	0.193
		135	8.437	135	0.17630	325	0.196
		140	9.273	140	0.19220	350	0.199
		145	10.180	145	0.20920	375	0.202
		150	11.150	150	0.22730	400	0.205
		155	12.200	155	0.24670	425	0.208
		160	13.330	160	0.26730	450	0.210
		165	14.540	165	0.28930	475	0.213
		170	15.840	170	0.31270	500	0.215
		175	17.240	175	0.33760	525	0.217
		180	18.730	180	0.36390	550	0.219
		185	20.330	185	0.39180	575	0.222
		190	22.030	190	0.42140	600	0.223