

TETRACHLOROETHYLENE

TTE

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Perchloroethylene Perclene Perk Tetracap		Watery liquid Colorless Sweet odor
Sinks in water. Irritating vapor is produced.		
Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.		
Fire	Not flammable. Poisonous gases are produced when heated.	
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled, will cause difficult breathing, or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Irritating to 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 Stop discharge Contain Collection Systems: Pump Clean shore line	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: Not listed. 2.2 Formula: Cl ₂ C=CCl ₂ 2.3 IMO/UN Designation: 9.0/1897 2.4 DOT ID No.: 1897 2.5 CAS Registry No.: 127-18-4 2.6 NAERG Guide No.: 160 2.7 Standard Industrial Trade Classification: 51133
3. HEALTH HAZARDS	
<p>3.1 Personal Protective Equipment: For high vapor concentrations use approved canister or air-supplied mask; chemical goggles or face shield; plastic gloves.</p> <p>3.2 Symptoms Following Exposure: Vapor can affect central nervous system and cause anesthesia. Liquid may irritate skin after prolonged contact. May irritate eyes but causes no injury.</p> <p>3.3 Treatment of Exposure: INHALATION: if illness occurs, remove patient to fresh air, keep him warm and quiet, and get medical attention. INGESTION: induce vomiting only on physician's recommendation. EYES AND SKIN: flush with plenty of water and get medical attention if irritation or injury occurs.</p> <p>3.4 TLV-TWA: 25 ppm 3.5 TLV-STEL: 100 ppm 3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 2; LD₅₀ = 0.5 to 5 g/kg 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: None 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause a slight smarting of the eyes or throat if present in high concentrations. The effect is temporary. 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin. 3.12 Odor Threshold: 5 ppm 3.13 IDLH Value: 150 ppm 3.14 OSHA PEL-TWA: 100 ppm 3.15 OSHA PEL-STEL: 300 ppm, 5 minute peak in any 3 hours 3.16 OSHA PEL-Ceiling: 200 ppm 3.17 EPA AEGL: Not listed</p>	

4. FIRE HAZARDS

- 4.1 **Flash Point:** Not flammable
4.2 **Flammable Limits in Air:** Not flammable
4.3 **Fire Extinguishing Agents:** Not pertinent
4.4 **Fire Extinguishing Agents Not to Be Used:** Not pertinent
4.5 **Special Hazards of Combustion Products:** Toxic, irritating gases may be generated in fires.
4.6 **Behavior in Fire:** Not pertinent
4.7 **Auto Ignition Temperature:** Not flammable
4.8 **Electrical Hazards:** Not pertinent
4.9 **Burning Rate:** Not flammable
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

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:** Not pertinent
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):** None
6.4 **Food Chain Concentration Potential:** None
6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Dry cleaning and industrial grades: 95+%
7.2 **Storage Temperature:** Ambient
7.3 **Inert Atmosphere:** No requirement
7.4 **Venting:** Pressure-vacuum
7.5 **IMO Pollution Category:** B
7.6 **Ship Type:** 3
7.7 **Barge Hull Type:** 3

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).....	0
Instability (Yellow).....	0

8.6 **EPA Reportable Quantity:** 100 pounds
8.7 **EPA Pollution Category:** B
8.8 **RCRA Waste Number:** U210/D039
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:** 165.83
9.3 **Boiling Point at 1 atm:** 250°F = 121°C = 394°K
9.4 **Freezing Point:** -8.3°F = -22.4°C = 250.8°K
9.5 **Critical Temperature:** 656.6°F = 347°C = 620.2°K
9.6 **Critical Pressure:** Not pertinent
9.7 **Specific Gravity:** 1.63 at 20°C (liquid)
9.8 **Liquid Surface Tension:** 31.3 dynes/cm = 0.0313 N/m at 20°C
9.9 **Liquid Water Interfacial Tension:** 44.4 dynes/cm = 0.0444 N/m at 25°C
9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.116
9.12 **Latent Heat of Vaporization:** 90.2 Btu/lb = 50.1 cal/g = 2.10 X 10⁵ J/kg
9.13 **Heat of Combustion:** Not pertinent
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:** Currently not available

NOTES

TETRACHLOROETHYLENE

TTE

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
35	103.400	0	0.198		N	55	0.958
40	103.099	10	0.200		O	60	0.929
45	102.900	20	0.201		T	65	0.900
50	102.599	30	0.202			70	0.873
55	102.299	40	0.203		P	75	0.848
60	102.000	50	0.204		E	80	0.823
65	101.700	60	0.205		R	85	0.800
70	101.400	70	0.206		T	90	0.777
75	101.099	80	0.207		I	95	0.756
80	100.799	90	0.208		N	100	0.736
85	100.500	100	0.210		E	105	0.716
90	100.200	110	0.211		N	110	0.698
95	99.910	120	0.212		T	115	0.680
100	99.610	130	0.213			120	0.663
105	99.320	140	0.214			125	0.647
110	99.020	150	0.215			130	0.631
115	98.730	160	0.216			135	0.616
120	98.429	170	0.217			140	0.601
125	98.139	180	0.218			145	0.588
130	97.839	190	0.220			150	0.574
135	97.549	200	0.221			155	0.561
140	97.250	210	0.222			160	0.549
145	96.959					165	0.537
150	96.669					170	0.526
155	96.370					175	0.515
160	96.080						

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	0.016	60	0.236	60	0.00702	0	0.108
		70	0.318	70	0.00929	25	0.110
		80	0.425	80	0.01216	50	0.113
		90	0.561	90	0.01575	75	0.116
		100	0.732	100	0.02022	100	0.118
		110	0.948	110	0.02571	125	0.120
		120	1.217	120	0.03242	150	0.122
		130	1.548	130	0.04055	175	0.125
		140	1.953	140	0.05032	200	0.127
		150	2.446	150	0.06199	225	0.129
		160	3.042	160	0.07583	250	0.131
		170	3.756	170	0.09215	275	0.132
		180	4.607	180	0.11130	300	0.134
		190	5.616	190	0.13360	325	0.136
		200	6.805	200	0.15940	350	0.138
		210	8.199	210	0.18910	375	0.139
		220	9.824	220	0.22330	400	0.141
		230	11.710	230	0.26230	425	0.142
		240	13.890	240	0.30660	450	0.143
		250	16.390	250	0.35680	475	0.144
		260	19.260	260	0.41330	500	0.146
		270	22.520	270	0.47680	525	0.147
		280	26.230	280	0.54790	550	0.148
						575	0.148
						600	0.149