

TRICHLOROFLUOROMETHANE

TCF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms		Liquid	Colorless	Odorless
Arcton 9 Eskimon 11 F-11 Freon 11 Frigen 11 Genetron 11 Iscon 11 Isotron 11 Ucon 11		Sinks in water. Harmful vapor is produced. Boiling point is 75°F.		
Keep people away. Avoid contact with liquid and vapor. Notify local health and pollution control agencies. Protect water intakes.				
Fire	Not flammable. POISONOUS GASES MAY BE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus.			
Exposure	CALL FOR MEDICAL AID. VAPOR 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 Not harmful.			
Water Pollution	Not harmful to aquatic life. 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: Not listed. 2.2 Formula: CFCs 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: Not listed 2.5 CAS Registry No.: 75-69-4 2.6 NAERG Guide No.: Not listed 2.7 Standard Industrial Trade Classification: 51137
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Air line respirator; rubber gloves; monogoggles 3.2 Symptoms Following Exposure: Breathing concentrations approaching 10% in air will cause dizziness and drowsiness. Contact with tissues may cause frostbite. 3.3 Treatment of Exposure: INHALATION: remove victim to non-contaminated area and apply artificial respiration if breathing has stopped; call a physician immediately; oxygen inhalation may be utilized. SKIN: if frostbite has occurred, flush areas with warm water. 3.4 TLV-TWA: Not listed. 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: 1,000 ppm 3.7 Toxicity by Ingestion: Currently not available 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available 3.10 Vapor (Gas) Irritant Characteristics: Non-irritating 3.11 Liquid or Solid Characteristics: May cause frostbite. 3.12 Odor Threshold: Currently not available 3.13 IDLH Value: 2,000 ppm 3.14 OSHA PEL-TWA: 1,000 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:**
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:** Produces irritating and toxic products when heated to decomposition temperatures.
- 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:**
None
- 6.2 **Waterfowl Toxicity:** None
- 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:** Technical
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Safety relief
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed
- 8.2 **49 CFR Class:** Not pertinent
- 8.3 **49 CFR Package Group:** Not listed.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:** Not listed
- 8.6 **EPA Reportable Quantity:** 5000 pounds
- 8.7 **EPA Pollution Category:** D
- 8.8 **RCRA Waste Number:** U121
- 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Currently not available
- 9.2 **Molecular Weight:** Currently not available
- 9.3 **Boiling Point at 1 atm:** Currently not available
- 9.4 **Freezing Point:** Currently not available
- 9.5 **Critical Temperature:** Currently not available
- 9.6 **Critical Pressure:** Currently not available
- 9.7 **Specific Gravity:** Currently not available
- 9.8 **Liquid Surface Tension:** Currently not available
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** Currently not available
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Currently not available
- 9.12 **Latent Heat of Vaporization:** Currently not available
- 9.13 **Heat of Combustion:** Currently not available
- 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

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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
-35	100.200	-140	0.189		N		N
-30	99.809	-120	0.191		O		O
-25	99.459	-100	0.193		T		T
-20	99.110	-80	0.196				
-15	98.770	-60	0.198		P		P
-10	98.419	-40	0.200		E		E
-5	98.070	-20	0.202		R		R
0	97.730	0	0.204		T		T
5	97.379	20	0.207		I		I
10	97.030	40	0.209		N		N
15	96.690	60	0.211		E		E
20	96.339	80	0.213		N		N
25	95.990	100	0.216		T		T
30	95.650	120	0.218				
35	95.299	140	0.220				
40	94.950	160	0.222				
45	94.610						
50	94.259						
55	93.910						
60	93.570						
65	93.219						
70	92.870						
75	92.520						
80	92.179						
85	91.830						
90	91.480						

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	0.110	-50	0.560	-50	0.01749	30	0.127
		-40	0.780	-40	0.02381	35	0.127
		-30	1.072	-30	0.03193	40	0.127
		-20	1.451	-20	0.04223	45	0.127
		-10	1.937	-10	0.05514	50	0.127
		0	2.554	0	0.07113	55	0.127
		10	3.329	10	0.09072	60	0.127
		20	4.291	20	0.11450	65	0.127
		30	5.473	30	0.14310	70	0.127
		40	6.914	40	0.17710	75	0.127
		50	8.655	50	0.21740	80	0.127
		60	10.740	60	0.26450	85	0.127
		70	13.220	70	0.31950	90	0.127
		80	16.150	80	0.38300	95	0.127
		90	19.580	90	0.45600	100	0.127
		100	23.580	100	0.53930	105	0.127
		110	28.210	110	0.63390	110	0.127
		120	33.550	120	0.74080	115	0.127
						120	0.127
						125	0.127
						130	0.127
						135	0.127
						140	0.127
						145	0.127
						150	0.127
						155	0.127