

CHLORODIFLUOROMETHANE

MCF

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Eskimon-22 Freon-22 Genetron 22 Isotron 22 Monochlorodifluoromethane Uconn-22		Liquefied compressed gas Colorless Faint odor
Liquid sinks and boils in water. Visible vapor cloud is formed.		
Evacuate. Keep people away. Avoid contact with liquid. Notify local health and pollution control agencies.		
Fire	Not flammable. POISONOUS GASES ARE PRODUCED WHEN HEATED. Wear goggles and self-contained breathing apparatus. Cool exposed containers with water.	
Exposure	CALL FOR MEDICAL AID. VAPOR Not irritating to eyes, nose or throat. If inhaled, will cause dizziness or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will cause frostbite. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS.	
Water Pollution	Not harmful to aquatic life.	

1. CORRECTIVE RESPONSE ACTIONS Dilute and disperse Stop discharge	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 36; Halogenated hydrocarbon 2.2 Formula: CHClF ₂ 2.3 IMO/UN Designation: 2.0/1018 2.4 DOT ID No.: 1018 2.5 CAS Registry No.: 75-45-6 2.6 NAERG Guide No.: 126 2.7 Standard Industrial Trade Classification: 51137
3. HEALTH HAZARDS 3.1 Personal Protective Equipment: Rubber gloves; goggles. 3.2 Symptoms Following Exposure: Inhalation at greater than 10% concentration in air may cause narcosis. Liquid may cause frostbite. 3.3 Treatment of Exposure: Remove victim to non-contaminated area and apply artificial respiration if breathing has stopped. Call a physician immediately. Oxygen inhalation may be utilized. 3.4 TLV-TWA: 1,000 ppm 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Not pertinent 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: None 3.10 Vapor (Gas) Irritant Characteristics: Vapors are nonirritating to the eyes and throat. 3.11 Liquid or Solid Characteristics: No appreciable hazard. Practically harmless to the skin because it evaporates quickly. Liquid may cause frostbite. 3.12 Odor Threshold: Currently not available 3.13 IDLH Value: Not listed. 3.14 OSHA PEL-TWA: Not listed. 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: Decomposition gases are toxic and irritating. 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	7. SHIPPING INFORMATION 7.1 Grades of Purity: Propellant grade 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: 3
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	8. HAZARD CLASSIFICATIONS 8.1 49 CFR Category: Nonflammable gas 8.2 49 CFR Class: 2.2 8.3 49 CFR Package Group: Not pertinent. 8.4 Marine Pollutant: No 8.5 NFPA Hazard Classification: Not listed 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
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	9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Physical State at 15° C and 1 atm: Gas 9.2 Molecular Weight: 86.48 9.3 Boiling Point at 1 atm: -40.9°F = -40.5°C = 232.7°K 9.4 Freezing Point: Not pertinent 9.5 Critical Temperature: 204.8°F = 96.0°C = 369.2°K 9.6 Critical Pressure: 716 psia = 48.7 atm = 4.93 MN/m ² 9.7 Specific Gravity: 1.41 at -40°C (liquid) 9.8 Liquid Surface Tension: (est.) 15 dynes/cm = 0.015 N/m at -41°C 9.9 Liquid Water Interfacial Tension: Currently not available 9.10 Vapor (Gas) Specific Gravity: 3.0 9.11 Ratio of Specific Heats of Vapor (Gas): (est.) 1.13 9.12 Latent Heat of Vaporization: 101 Btu/lb = 55.9 cal/g = 2.34 X 10 ⁶ 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: 212.6 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
-110	94.450		N		C		N
-105	93.980		O		U		O
-100	93.509		T		R		T
-95	93.040				R		
-90	92.570		P		E		P
-85	92.110		E		N		E
-80	91.639		R		T		R
-75	91.169		T		L		T
-70	90.700		I		L		I
-65	90.230		N		E		N
-60	89.759		E		N		E
-55	89.299		N		O		N
-50	88.830		T		T		T
-45	88.360				A		
					V		
					A		
					I		
					L		
					A		
					B		
					L		
					A		
					B		
					L		
					L		
					E		

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	0.300	-110	1.696	-110	0.03907		C
		-105	2.039	-105	0.04632		U
		-100	2.440	-100	0.05465		R
		-95	2.904	-95	0.06417		R
		-90	3.441	-90	0.07500		E
		-85	4.059	-85	0.08728		N
		-80	4.767	-80	0.10120		T
		-75	5.576	-75	0.11680		L
		-70	6.495	-70	0.13430		L
		-65	7.536	-65	0.15380		
		-60	8.712	-60	0.17560		N
		-55	10.040	-55	0.19980		O
		-50	11.520	-50	0.22650		T
		-45	13.180	-45	0.25610		
		-40	15.030	-40	0.28850		A
		-35	17.090	-35	0.32420		V
		-30	19.370	-30	0.36320		A
		-25	21.890	-25	0.40580		I
		-20	24.680	-20	0.45220		L
		-15	27.740	-15	0.50260		A
		-10	31.100	-10	0.55720		B
		-5	34.780	-5	0.61630		L
		0	38.810	0	0.68010		A
		5	43.190	5	0.74880		B
		10	47.960	10	0.82270		L