

## DICHLORODIFLUOROMETHANE

DCF

CAUTIONARY RESPONSE INFORMATION						
<b>Common Synonyms</b> Arton 6 Eskimon 12 F-12 Freon 12 Frigen 12 Genetron 12 Halon 122 Isotron 12 Ucon 12	Gas  Visible vapor cloud is produced.	Colorless	Faint odor			
<b>Notify local health and pollution control agencies. Avoid inhalation.</b>						
<b>Fire</b>	Not flammable. Cool exposed containers with water.					
<b>Exposure</b>	<b>CALL FOR MEDICAL AID.</b>  <b>VAPOR</b> Not irritating to eyes, nose or throat. If inhaled, will cause dizziness, difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.					
<b>Water Pollution</b>	Not harmful to aquatic life.					
<b>4. FIRE HAZARDS</b>						
4.1 <b>Flash Point:</b> Not flammable						
4.2 <b>Flammable Limits in Air:</b> Not flammable						
4.3 <b>Fire Extinguishing Agents:</b> Not flammable						
4.4 <b>Fire Extinguishing Agents Not To Be Used:</b> Not flammable						
4.5 <b>Special Hazards of Combustion Products:</b> Although nonflammable, dissociation products generated in a fire may be irritating or toxic.						
4.6 <b>Behavior in Fire:</b> Helps extinguish fire.						
4.7 <b>Auto Ignition Temperature:</b> Not flammable						
4.8 <b>Electrical Hazards:</b> Not pertinent						
4.9 <b>Burning Rate:</b> Not flammable						
4.10 <b>Adiabatic Flame Temperature:</b> Currently not available						
4.11 <b>Stoichiometric Air to Fuel Ratio:</b> Not pertinent						
4.12 <b>Flame Temperature:</b> Currently not available						
4.13 <b>Combustion Molar Ratio (Reactant to Product):</b> Not pertinent						
4.14 <b>Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed						
<b>5. CHEMICAL REACTIVITY</b>						
<b>7. SHIPPING INFORMATION</b>						
7.1 <b>Grades of Purity:</b> 99.5% (vol.)						
7.2 <b>Storage Temperature:</b> Ambient						
7.3 <b>Inert Atmosphere:</b> No requirement						
7.4 <b>Venting:</b> Safety relief						
7.5 <b>IMO Pollution Category:</b> Currently not available						
7.6 <b>Ship Type:</b> Currently not available						
7.7 <b>Barge Hull Type:</b> 3						
<b>8. HAZARD CLASSIFICATIONS</b>						
8.1 <b>49 CFR Category:</b> Nonflammable gas						
8.2 <b>49 CFR Class:</b> 2.2						
8.3 <b>49 CFR Package Group:</b> Not pertinent.						
8.4 <b>Marine Pollutant:</b> No						
8.5 <b>NFPA Hazard Classification:</b> Not listed						
8.6 <b>EPA Reportable Quantity:</b> 5000 pounds						
8.7 <b>EPA Pollution Category:</b> D						
8.8 <b>RCRA Waste Number:</b> U075						
8.9 <b>EPA FWPCL List:</b> Not listed						
<b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b>						
9.1 <b>Physical State at 15° C and 1 atm:</b> Gas						
9.2 <b>Molecular Weight:</b> 120.91						
9.3 <b>Boiling Point at 1 atm:</b> -21.6°F = -29.8°C = 243.4K						
9.4 <b>Tearing Point:</b> 651.9°F = 300.0°C						

<p><b>1. CORRECTIVE RESPONSE ACTIONS</b></p> <p>Stop discharge</p>	<p><b>2. CHEMICAL DESIGNATIONS</b></p> <p><b>2.1 CG Compatibility Group:</b> 36; Halogenated hydrocarbon</p> <p><b>2.2 Formula:</b> <math>\text{CCl}_2\text{F}_2</math></p> <p><b>2.3 IMO/UN Designation:</b> 2.0/1028</p> <p><b>2.4 DOT ID No.:</b> 1028</p> <p><b>2.5 CAS Registry No.:</b> 75-71-8</p> <p><b>2.6 NAERG Guide No.:</b> 126</p> <p><b>2.7 Standard Industrial Trade Classification:</b> 51137</p>
<b>3. HEALTH HAZARDS</b>	
<p><b>3.1 Personal Protective Equipment:</b> Rubber gloves, monogoggles.</p>	
<p><b>3.2 Symptoms Following Exposure:</b> INHALATION: some narcosis when 10% in air is breathed.</p>	
<p><b>3.3 Treatment of Exposure:</b> Remove patient to non-contaminated area and apply artificial respiration if breathing has stopped; call a physician immediately; oxygen may be given.</p>	
<p><b>3.4 TLV-TWA:</b> 1,000 ppm</p>	
<p><b>3.5 TLV-STEL:</b> Not listed.</p>	
<p><b>3.6 TLV-Ceiling:</b> Not listed.</p>	
<p><b>3.7 Toxicity by Ingestion:</b> Not pertinent</p>	
<p><b>3.8 Toxicity by Inhalation:</b> Currently not available.</p>	
<p><b>3.9 Chronic Toxicity:</b> None</p>	
<p><b>3.10 Vapor (Gas) Irritant Characteristics:</b> None, except at very high concentrations, which may irritate lungs.</p>	
<p><b>3.11 Liquid or Solid Characteristics:</b> No appreciable hazard. Practically harmless to the skin because it is very volatile and evaporates quickly.</p>	
<p><b>3.12 Odor Threshold:</b> Currently not available</p>	
<p><b>3.13IDLH Value:</b> 15,000 ppm</p>	
<p><b>3.14 OSHA PEL-TWA:</b> 1,000 ppm</p>	
<p><b>3.15 OSHA PEL-STEL:</b> Not listed.</p>	
<p><b>3.16 OSHA PEL-Ceiling:</b> Not listed.</p>	
<p><b>3.17 EPA AERL:</b> Not listed</p>	

4. FIRE HAZARDS		7. SHIPPING INFORMATION	
<b>4.1 Flash Point:</b>	Not flammable	<b>7.1 Grades of Purity:</b>	99.5% (vol.)
<b>4.2 Flammable Limits in Air:</b>	Not flammable	<b>7.2 Storage Temperature:</b>	Ambient
<b>4.3 Fire Extinguishing Agents:</b>	Not flammable	<b>7.3 Inert Atmosphere:</b>	No requirement
<b>4.4 Fire Extinguishing Agents Not to Be Used:</b>	Not flammable	<b>7.4 Venting:</b>	Safety relief
<b>4.5 Special Hazards of Combustion Products:</b>	Although nonflammable, dissociation products generated in a fire may be irritating or toxic.	<b>7.5 IMO Pollution Category:</b>	Currently not available
<b>4.6 Behavior in Fire:</b>	Helps extinguish fire.	<b>7.6 Ship Type:</b>	Currently not available
<b>4.7 Auto Ignition Temperature:</b>	Not flammable	<b>7.7 Barge Hull Type:</b>	3
<b>4.8 Electrical Hazards:</b>	Not pertinent	<hr/>	
<b>4.9 Burning Rate:</b>	Not flammable	8. HAZARD CLASSIFICATIONS	
<b>4.10 Adiabatic Flame Temperature:</b>	Currently not available	<b>8.1</b>	49 CFR Category: Nonflammable gas
<b>4.11 Stoichiometric Air to Fuel Ratio:</b>	Not pertinent	<b>8.2</b>	49 CFR Class: 2.2
<b>4.12 Flame Temperature:</b>	Currently not available	<b>8.3</b>	49 CFR Package Group: Not pertinent.
<b>4.13 Combustion Molar Ratio (Reactant to Product):</b>	Not pertinent	<b>8.4</b>	Marine Pollutant: No
<b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b>	Not listed	<b>8.5</b>	NFPA Hazard Classification: Not listed
<hr/>		<b>8.6</b>	EPA Reportable Quantity: 5000 pounds
<b>5. CHEMICAL REACTIVITY</b>		<b>8.7</b>	EPA Pollution Category: D
<b>5.1 Reactivity with Water:</b>	No reaction	<b>8.8</b>	RCRA Waste Number: U075
<b>5.2 Reactivity with Common Materials:</b>	No reaction	<b>8.9</b>	EPA FWPCA List: Not listed
<b>5.3 Stability During Transport:</b>	Stable	<hr/>	
<b>5.4 Neutralizing Agents for Acids and Caustics:</b>	Not pertinent	9. PHYSICAL & CHEMICAL PROPERTIES	
<b>5.5 Polymerization:</b>	Not pertinent	<b>9.1</b>	Physical State at 15°C and 1 atm: Gas
<b>5.6 Inhibitor of Polymerization:</b>	Not pertinent	<b>9.2</b>	Molecular Weight: 120.91
<hr/>		<b>9.3</b>	Boiling Point at 1 atm: -21.6°F = -29.8°C = 243.4°K
<b>6. WATER POLLUTION</b>		<b>9.4</b>	Freezing Point: -251.9°F = 157.7°C = 115.5°K
<b>6.1 Aquatic Toxicity:</b>	Not pertinent	<b>9.5</b>	Critical Temperature: 233.2°F = 111.8°C = 385°K
<b>6.2 Waterfowl Toxicity:</b>	Not pertinent	<b>9.6</b>	Critical Pressure: 598 psia = 40.7 atm = 4.12 MN/m²
<b>6.3 Biological Oxygen Demand (BOD):</b>	Not pertinent	<b>9.7</b>	Specific Gravity: 1.35 at 15°C (liquid)
<b>6.4 Food Chain Concentration Potential:</b>	None	<b>9.8</b>	Liquid Surface Tension: Not pertinent
<b>6.5 GESAMP Hazard Profile:</b>		<b>9.9</b>	Liquid Water Interfacial Tension: Not pertinent
Bioaccumulation: 0		<b>9.10</b>	Vapor (Gas) Specific Gravity: 4.2
Damage to living resources: 2		<b>9.11</b>	Ratio of Specific Heats of Vapor (Gas): 1.129
Human Oral hazard: I		<b>9.12</b>	Latent Heat of Vaporization: 140 Btu/lb = 77.9 cal/g = 3.26 x 10⁶ J/kg
Human Contact hazard: II		<b>9.13</b>	Heat of Combustion: Not pertinent
Reduction of amenities:		<b>9.14</b>	Heat of Decomposition: Not pertinent
		<b>9.15</b>	Heat of Solution: Not pertinent
		<b>9.16</b>	Heat of Polymerization: Not pertinent
		<b>9.17</b>	Heat of Fusion: Currently not available
		<b>9.18</b>	Limiting Value: Currently not available
		<b>9.19</b>	Reid Vapor Pressure: 132 psia

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**NOTES**

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DCF

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
	N O T  P E R T I N E N T	-35 -30 -25	0.221 0.223 0.224		N O T  P E R T I N E N T		N O T  P E R T I N E N T

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
	I N S O L U B L E	-45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80	13.380 15.240 17.310 19.600 22.120 24.880 27.910 31.220 34.820 38.740 43.000 47.600 52.580 57.940 63.710 69.900 76.540 83.639 91.230 99.320 107.900 117.099 126.799 137.099 148.000 159.599	-45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80	0.36340 0.40920 0.45920 0.51380 0.57310 0.63740 0.70690 0.78190 0.86270 0.94940 1.04200 1.14200 1.24800 1.36000 1.48100 1.60800 1.74300 1.88600 2.03600 2.19500 2.36200 2.53800 2.72300 2.91600 3.11800 3.33000	0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600	0.135 0.139 0.142 0.145 0.148 0.151 0.154 0.156 0.159 0.161 0.164 0.166 0.168 0.170 0.172 0.173 0.175 0.176 0.178 0.179 0.180 0.181 0.182 0.183 0.183