

1,1-DIFLUOROETHANE

DFE

| CAUTIONARY RESPONSE INFORMATION | | 4. FIRE HAZARDS | 7. SHIPPING INFORMATION |
|---|---|---|--|
| Common Synonyms Ethylidene difluoride Ethylidene fluoride Refrigerant 152A | Liquefied compressed gas Sinks and boils in water. Flammable, irritating vapor is produced. Visible vapor cloud is produced. Boiling point is 76°F. | <p>4.1 Flash Point: Not pertinent</p> <p>4.2 Flammable Limits in Air: 3.7%-18%</p> <p>4.3 Fire Extinguishing Agents: Shut off gas source; use water to cool adjacent combustibles.</p> <p>4.4 Fire Extinguishing Agents Not to Be Used: Currently not available</p> <p>4.5 Special Hazards of Combustion Products: Irritating hydrogen fluoride fumes may form in fire.</p> <p>4.6 Behavior in Fire: Containers may explode. Vapors are heavier than air and may travel a considerable distance to an ignition source and flash back.</p> <p>4.7 Auto Ignition Temperature: Currently not available</p> <p>4.8 Electrical Hazards: Currently not available</p> <p>4.9 Burning Rate: Not pertinent</p> <p>4.10 Adiabatic Flame Temperature: Currently not available</p> <p>4.11 Stoichiometric Air to Fuel Ratio: 11.9 (calc.)</p> <p>4.12 Flame Temperature: Currently not available</p> <p>4.13 Combustion Molar Ratio (Reactant to Product): 5.0 (calc.)</p> <p>4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed</p> | <p>7.1 Grades of Purity: Commercial</p> <p>7.2 Storage Temperature: Ambient</p> <p>7.3 Inert Atmosphere: No requirement</p> <p>7.4 Venting: Safety relief</p> <p>7.5 IMO Pollution Category: Currently not available</p> <p>7.6 Ship Type: Currently not available</p> <p>7.7 Barge Hull Type: Currently not available</p> |
| Fire | FLAMMABLE. POISONOUS GASES MAY BE PRODUCED IN FIRE. Containers may explode in fire. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear goggles and self-contained breathing apparatus. Stop flow of gas if possible. Let fire burn. Cool exposed containers with water. | | <p>8. HAZARD CLASSIFICATIONS</p> <p>8.1 49 CFR Category: Flammable gas</p> <p>8.2 49 CFR Class: 2.1</p> <p>8.3 49 CFR Package Group: Not pertinent</p> <p>8.4 Marine Pollutant: No</p> <p>8.5 NFPA Hazard Classification: Not listed</p> <p>8.6 EPA Reportable Quantity: Not listed</p> <p>8.7 EPA Pollution Category: Not listed</p> <p>8.8 RCRA Waste Number: Not listed</p> <p>8.9 EPA FWPCA List: Not listed</p> |
| Exposure | CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. Harmful if inhaled. Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn eyes. Will cause frostbite. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. DO NOT RUB AFFECTED AREAS. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. | <p>9. PHYSICAL & CHEMICAL PROPERTIES</p> <p>9.1 Physical State at 15°C and 1 atm: Gas</p> <p>9.2 Molecular Weight: 66.05</p> <p>9.3 Boiling Point at 1 atm: 52.3°F = 11.3°C = 248.5K</p> <p>9.4 Freezing Point: -179°F = -117°C = 156°K</p> <p>9.5 Critical Temperature: 236.3°F = 113.5°C = 386.7°K</p> <p>9.6 Critical Pressure: 652 psia = 44.37 atm = 4.50 MN/m²</p> <p>9.7 Specific Gravity: 0.95 at 20°C (liquid)</p> <p>9.8 Liquid Surface Tension: 11.25 dynes/cm = 0.01125 N/m at 20°C</p> <p>9.9 Liquid Water Interfacial Tension: Currently not available</p> <p>9.10 Vapor (Gas) Specific Gravity: 2.3</p> <p>9.11 Ratio of Specific Heats of Vapor (Gas): 1.141</p> <p>9.12 Latent Heat of Vaporization: 140.5 Btu/lb = 78.03 cal/g = 3.265 X 10⁵ J/kg</p> <p>9.13 Heat of Combustion: -7,950 Btu/lb = -4,420 cal/g = -185 X 10³ J/kg</p> <p>9.14 Heat of Decomposition: Not pertinent</p> <p>9.15 Heat of Solution: Not pertinent</p> <p>9.16 Heat of Polymerization: Not pertinent</p> <p>9.17 Heat of Fusion: Currently not available</p> <p>9.18 Limiting Value: Currently not available</p> <p>9.19 Reid Vapor Pressure: Currently not available</p> | |
| Water Pollution | Not harmful to aquatic life. | <p>5. CHEMICAL REACTIVITY</p> <p>5.1 Reactivity with Water: No reaction</p> <p>5.2 Reactivity with Common Materials: Currently not available</p> <p>5.3 Stability During Transport: Stable</p> <p>5.4 Neutralizing Agents for Acids and Caustics: Not pertinent</p> <p>5.5 Polymerization: Not pertinent</p> <p>5.6 Inhibitor of Polymerization: Not pertinent</p> <p>6. WATER POLLUTION</p> <p>6.1 Aquatic Toxicity: Currently not available</p> <p>6.2 Waterfowl Toxicity: Currently not available</p> <p>6.3 Biological Oxygen Demand (BOD): None</p> <p>6.4 Food Chain Concentration Potential: None</p> <p>6.5 GESAMP Hazard Profile: Not listed</p> | NOTES |

| 1. CORRECTIVE RESPONSE ACTIONS | 2. CHEMICAL DESIGNATIONS | 3. HEALTH HAZARDS |
|--------------------------------|--|--|
| Stop discharge Do not burn | <p>2.1 CG Compatibility Group: Not listed.</p> <p>2.2 Formula: CH₂CF₂</p> <p>2.3 IMO/UN Designation: 2/1030</p> <p>2.4 DOT ID No.: 1030</p> <p>2.5 CAS Registry No.: 75-37-6</p> <p>2.6 NAERG Guide No.: 115</p> <p>2.7 Standard Industrial Trade Classification: 51137</p> | |
| | | <p>3.1 Personal Protective Equipment: Individual breathing devices with air supply; neoprene gloves; protective clothing; eye protection</p> <p>3.2 Symptoms Following Exposure: Inhalation of concentrated gas will cause suffocation. Contact with liquid can damage eyes because of low temperature. Frostbite may result from contact with liquid.</p> <p>3.3 Treatment of Exposure: INHALATION: remove to fresh air; use artificial respiration if necessary. EYES: get medical attention if liquid has entered eyes. SKIN: soak in lukewarm water (for frostbite).</p> <p>3.4 TLV-TWA: Not listed.</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Not pertinent (boils at -24.7°C)</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: Currently not available</p> <p>3.11 Liquid or Solid Characteristics: Currently not available</p> <p>3.12 Odor Threshold: Currently not available</p> <p>3.13 IDLH Value: Not listed.</p> <p>3.14 OSHA PEL-TWA: Not listed.</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA A EGL: Not listed</p> |
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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 |
| | N O T P E R T I N E N T | | N O T P E R T I N E N T | | N O T P E R T I N E N T | -10 -5 0 5 10 15 20 25 30 35 40 45 50 | 0.346 0.337 0.328 0.321 0.313 0.306 0.299 0.292 0.286 0.279 0.274 0.268 0.263 |

| 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 | -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 | 15.460 17.370 19.470 21.770 24.290 27.030 30.020 33.260 36.780 40.590 44.700 49.130 53.910 59.040 64.549 70.450 76.770 83.520 90.709 98.379 | -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 | 0.21150 0.23510 0.26060 0.28830 0.31820 0.35040 0.38500 0.42230 0.46210 0.50480 0.55040 0.59900 0.65080 0.70590 0.76430 0.82620 0.89180 0.96110 1.03400 1.11100 | 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 | 0.220 0.229 0.237 0.245 0.253 0.261 0.269 0.277 0.284 0.291 0.298 0.305 0.312 0.319 0.326 0.332 0.338 0.344 0.350 0.356 0.362 0.368 0.373 0.379 0.384 |