

1,1-DIFLUOROETHANE

DFE

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Ethylidene difluoride Ethylidene fluoride Refrigerant 152A		Liquefied compressed gas Colorless
Sinks and boils in water. Flammable, irritating vapor is produced. Visible vapor cloud is produced. Boiling point is 76°F.		
Evacuate. Keep people away. Avoid contact with liquid and vapor. Shut off ignition sources. Call fire department. Stay upwind. Use water spray to "knock down" vapor. Notify local health and pollution control agencies.		
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.	
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.	
Water Pollution	Not harmful to aquatic life.	

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge
 Do not burn

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed.
- 2.2 Formula: CH₂CHF₂
- 2.3 IMO/UN Designation: 2/1030
- 2.4 DOT ID No.: 1030
- 2.5 CAS Registry No.: 75-37-6
- 2.6 NAERG Guide No.: 115
- 2.7 Standard Industrial Trade Classification: 51137

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Individual breathing devices with air supply; neoprene gloves; protective clothing; eye protection
- 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.
- 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).
- 3.4 TLV-TWA: Not listed.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 **Toxicity by Ingestion:** Not pertinent (boils at -24.7°C)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 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 pertinent
- 4.2 **Flammable Limits in Air:** 3.7%-18%
- 4.3 **Fire Extinguishing Agents:** Shut off gas source; use water to cool adjacent combustibles.
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Currently not available
- 4.5 **Special Hazards of Combustion Products:** Irritating hydrogen fluoride fumes may form in fire.
- 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.
- 4.7 **Auto Ignition Temperature:** Currently not available
- 4.8 **Electrical Hazards:** Currently not available
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 11.9 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 5.0 (calc.)
- 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:** Currently not available
- 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:** Commercial
- 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:** Flammable gas
- 8.2 **49 CFR Class:** 2.1
- 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

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Gas
- 9.2 **Molecular Weight:** 66.05
- 9.3 **Boiling Point at 1 atm:** 52.3°F = 11.3°C = 248.5°K
- 9.4 **Freezing Point:** -179°F = -117°C = 156°K
- 9.5 **Critical Temperature:** 236.3°F = 113.5°C = 386.7°K
- 9.6 **Critical Pressure:** 652 psia = 44.37 atm = 4.50 MN/m²
- 9.7 **Specific Gravity:** 0.95 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 11.25 dynes/cm = 0.01125 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** Currently not available
- 9.10 **Vapor (Gas) Specific Gravity:** 2.3
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.141
- 9.12 **Latent Heat of Vaporization:** 140.5 Btu/lb = 78.03 cal/g = 3.265 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -7,950 Btu/lb = -4,420 cal/g = -185 X 10⁵ J/kg
- 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
	NOT PERTINENT		NOT PERTINENT		NOT PERTINENT	-10	0.346
						-5	0.337
						0	0.328
						5	0.321
						10	0.313
						15	0.306
						20	0.299
						25	0.292
						30	0.286
						35	0.279
						40	0.274
						45	0.268
						50	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 I L I T Y	-10	15.460	-10	0.21150	0	0.220
		-5	17.370	-5	0.23510	25	0.229
		0	19.470	0	0.26060	50	0.237
		5	21.770	5	0.28830	75	0.245
		10	24.290	10	0.31820	100	0.253
		15	27.030	15	0.35040	125	0.261
		20	30.020	20	0.38500	150	0.269
		25	33.260	25	0.42230	175	0.277
		30	36.780	30	0.46210	200	0.284
		35	40.590	35	0.50480	225	0.291
		40	44.700	40	0.55040	250	0.298
		45	49.130	45	0.59900	275	0.305
		50	53.910	50	0.65080	300	0.312
		55	59.040	55	0.70590	325	0.319
		60	64.549	60	0.76430	350	0.326
		65	70.450	65	0.82620	375	0.332
		70	76.770	70	0.89180	400	0.338
	75	83.520	75	0.96110	425	0.344	
	80	90.709	80	1.03400	450	0.350	
	85	98.379	85	1.11100	475	0.356	
					500	0.362	
					525	0.368	
					550	0.373	
					575	0.379	
					600	0.384	